

South African Health Review

2019



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Health Systems Trust
1 Maryvale Road
Westville 3630
Durban
South Africa

Email: sahr@hst.org.za
Website: <http://www.hst.org.za>
Tel: +27 (0)31 266 9090
Fax: +27 (0)86 588 0394

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Foreword

This 22nd edition of the *South African Health Review (SAHR)* is offered in memory of Health Systems Trust board member, and health activist extraordinaire, Professor David Sanders.

The purpose of the *SAHR* has always been to analyse and assess progress and challenges in key areas of the health system, and to propose recommendations for improvement. We are pleased to continue this tradition in the 2019 edition, which features important information and commentary on the key issues, developments and challenges in our health system. These key issues, which are currently being debated, will impact the future of health care in South Africa significantly. We are also cognisant of the fact that South Africa's ambitious programme to implement National Health Insurance as a vehicle to enable transformation of the health system towards delivery of universal access to quality health services, has attracted significant attention in the global health community.

Additionally, this year's *Review* features the work of the first recipient of our Healthcare Workers' Writing Programme, which offers writing skills training and ongoing coaching throughout the publication process for identified first-time authors. In keeping with our commitment to strengthen public health capacity and expertise within the health arena, the programme will be extended over time to support more aspirant first-time writers for the *SAHR*, thereby growing the diversity of contributors to this important journal in the South African public health arena.

On behalf of the Board of the Health Systems Trust, I would like to thank the authors, reviewers, Editorial Advisory Committee members, editorial team and administrative personnel who have worked tirelessly to produce this *Review*. Collectively, your commitment and expertise have produced another excellent edition of the *SAHR*, and we thank you for your contribution.

Flavia Senkubuge
Chairperson of the Board of Trustees,
Health Systems Trust

A handwritten signature in black ink, appearing to read 'Flavia Senkubuge', with a stylized flourish at the end.

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Editors

Themba Moeti and Ashnie Padarath

Project Coordinator

Emma-Louise Mackie

Copy editor

Julia Casciola

Editorial Advisory Committee

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Contributing authors

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Editorial

The 2019 *South African Health Review* presents a unique collection of perspectives on the key challenges in implementing universal health coverage (UHC) in South Africa, as analysed by experts in various fields. Each of the 20 chapters deals with aspects of the UHC journey, dedicated towards an equitable and inclusive national health system that leaves no-one behind. While some authors describe the fundamental changes and practical considerations required to reconfigure the country's health system, others have reflected on specific programmatic areas and have made recommendations from a National Health Insurance (NHI)/UHC lens.

In addition, we are pleased to announce that this year's edition includes two innovations. First is the provision of concise summaries of the chapters in the form of 'chapters at a glance'. These are positioned together at the start of the publication for ease of reference and to give a quick overview; their inclusion has also meant that the editorial has become more streamlined. The second innovation is the introduction of our Healthcare Workers' Writing Programme (HCWWP), which provides support to first-time authors wanting to publish in the *Review*.

Universal Health Coverage

The first five chapters are arranged to inform, stimulate debate and foster consensus, building on the challenges and opportunities brought about by the implementation of UHC.

In chapter one, Andy Gray and Yousuf Vawda deliver a detailed description of the policy and legislative framework enabling current health reforms in the country. This is followed by Diane McIntyre's chapter in which she calls for broadening of the national discourse on UHC and proposes that the term UHC should be replaced with the more inclusive and less misleading term 'universal health system'. Mark Blecher and his co-authors consider some of the challenges and potential solutions to NHI from a financing perspective in chapter three.

In chapter four on establishing a NHI service benefits framework, Jeanne-Marie Tucker and colleagues describe the process currently being led by the National Department of Health (NDoH) to develop an explicit list of conditions and services that will be purchased by the NHI Fund from public and private providers across the country.

Although not arranged consecutively, the *Review* includes three predominantly data-driven chapters on UHC, capturing the complexities and potential of measuring progress and identifying trends. In chapter five, Thulile Zondi and Candy Day report on progress made in the implementation of NHI towards UHC, and identify information gaps impeding accurate measurement. Building on chapter five, chapter 20 on health and related indicators by Candy Day et al. focuses on the calculation and measurement of a South African UHC service coverage index. Also using data from a wide array of sources, Nhlanhla Ndlovu and team provide an analysis of health, HIV and TB resource allocation by the South African Government and two donor organisations in chapter 19.

Quality, competition and transparency

Drawing on the South African Lancet National Commission Report, in chapter six Laetitia Rispel and colleagues summarise the progress made in the provision of quality health care over the last 25 years of democracy. In chapter seven, Lungiswa Nkonki and colleagues from the Competition Commission provide an overview of some of the key findings of the Health Market Inquiry and examine the implications of these findings for the second phase of NHI implementation.

Finally, the opacity of medical scheme benefits is the subject of chapter eight, with Phakamile Nkomo and colleagues describing the challenges encountered by consumers when choosing benefit options due to lack of transparency and absence of standardised information.

A life-course approach

The next cluster of chapters is arranged according to a life-course perspective, which underscores how the right interventions at key stages of life, from pre-conception through pregnancy, the newborn phase and early childhood, to adolescence, adulthood and ageing, can impact on health and well-being and affect one's life trajectory.

Lydia Cairncross and team report on a multi-pronged strategy to increase capacity for breast cancer care in chapter nine, while in chapter 10, Renay Weiner and colleagues describe the development of quality standards for the treatment of maternal hypertension. Understanding barriers to HIV testing and treatment in men is the subject of chapter 11, written by James Bell and colleagues.

The vulnerabilities and the short- and long-term morbidity and mortality of preterm birth infants are examined by Vundli Ramokolo and team in chapter 12. Chapter 13, written by Lesley Bamford and colleagues, highlights the importance of early childhood development, particularly in the first 1 000 days of a child's life. Providing universal health care to the burgeoning adolescent population is the subject of chapter 14, led by Kim Jonas, while an accompanying contribution from Anabel Gomez et al. (chapter 15) sheds light on barriers to HIV prevention in high-risk adolescent girls and young women.

In chapter 16, Geetesh Solanki and team reflect on how best to cater for the health needs of a rapidly ageing population in South Africa, beginning with the provision of comprehensive and multi-disciplinary interventions at primary care level.

Human resources for health

Adding to the body of information on human resources for health (HRH) recorded in the 2018 edition of the *SAHR*, chapter 17 penned by Zuki Tshabalala and team unpacks the contribution of clinical associates towards improving efficiency and effectiveness in the South African health system.

Still on the subject of HRH, Judith Mahlangu, the beneficiary of this year's HCWWP, and co-authors provide a rare glimpse into a community worker's experience of working with health science academics and students (chapter 18).

Conclusion

As 2019 draws to a close, South Africa stands at the threshold of a profound health system transformation. Twenty-five years post democracy, the NHI Bill submitted to parliament in August this year charts the way towards realisation of universal access to quality health care for all of South Africa's people. This edition of the *SAHR* highlights and provides a timely analysis of key issues debated in various fora over the past year that must challenge policy makers, providers, funders and users of healthcare services if the vision of equitable and sustainable access to quality health services is to be realised, in a manner that eliminates current disparities in access, and that overcomes the inefficiencies and challenges of the current health system.

All in all, this edition provides a panoramic snapshot of progress over the past 25 years, with a description of the current state and the gaps that exist in health service, financial and other information, with the intention of informing the journey across a broad spectrum of service areas. It is our hope that this edition will inspire further frank debate, analysis, research and innovation to guide the country on its ambitious journey towards universal access to a quality health system and service.

Themba L. Moeti and Ashnie Padarath
Editors

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Health legislation and policy



National Health Insurance (NHI) is proposed as a pathway to accelerate South Africa's achievement of universal health coverage (UHC) by 2030, as stipulated in Goal 3.8 of the Sustainable Development Goals.



The aim

One of the aims of this chapter is to provide an analysis of the NHI Bill, particularly the constitutional allocations of responsibility for financing, governance and management, and public participation and engagement. The implications for the private sector are also explored.



Key considerations around the NHI Fund

- Medical Schemes: The role of medical schemes will change in the future – they may only offer complementary cover to services not reimbursable by the Fund.
- Governance: The NHI Fund will be governed by an independent Board that is selected by and accountable to the Minister, but several alternative processes are also proposed.
- Service provision: The Fund will transfer funds directly to hospitals based on a global budget or Diagnosis Related Groups.
- Actors, processes and context: A large degree of uncertainty remains around the extent to which actors other than the Presidency and National Department of Health will be engaged in NHI.



Conclusion

The radical transformation of health services demands a high degree of policy coherence, as well as visionary stewardship from government in a participatory and inclusive national effort.

UHS: a public conversation



It is time for the public discussion around the NHI Bill to focus on how best to achieve a Universal Health System (UHS), backed with clear explanations of how proposed reforms will achieve this goal.



The aim

The purpose of this chapter is to provide information on the 'what' and 'how' of the proposed NHI. It explains the key elements of NHI reform and unpacks how they will contribute to achieving a UHS. It also considers some of the key concerns raised in debates around the Bill.



Lessons learnt

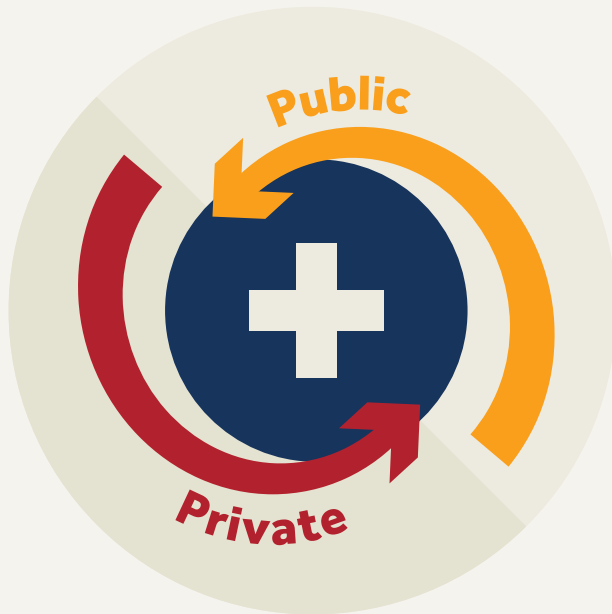
The reforms proposed in the NHI Bill are based on international best practice. They must be phased in gradually and sequenced appropriately, with an initial emphasis on improved resourcing of public sector primary care services, piloting of delegated service delivery management within the public sector, and building the strategic purchasing capacity of the NHI Fund. The NHI Fund will be allocated an annual budget from tax revenue; this budget limit will influence the pace of implementing reforms and ensure an affordable universal health system. Transparency and accountability are critical to realising an efficient and equitable health system.



Conclusion

Our current health system status quo is unacceptable. There are undoubtedly ways in which the NHI Bill can and must be improved. Taking explicit policy steps to move toward a UHS will improve access to quality health care for all and contribute to the redistributive agenda of the country. The focus of the public conversation must be firmly placed on how best to achieve a UHS.

NHI: vision, challenges and potential solutions



National Health Insurance (NHI) aims to bridge the currently two-tiered health system and build a more integrated health financing system drawing on both public and private provisions to achieve universal health coverage in South Africa.



The aim

This chapter gives a technical review of NHI vision, progress and challenges, and identifies potential solutions to assist the South African Government in making progress with NHI implementation.



Analytical framework

NHI is addressed here using an analytical framework built on key dimensions of health financing (identified by the World Health Organization) and core health-system functions. These include revenue raising, pooling, purchasing and provision.



Challenges

Several challenges are identified as impeding progress on NHI:

- Difficulties in centralising funding in a national NHI Fund
- Insufficient progress in building capacity to manage NHI
- Mistrust between government and the private sector
- Slow progress in building a mixed delivery platform
- Weakness in public sector provision and quality.



Looking forward

NHI has the potential to make the South African health sector more integrated, equitable and cost-effective. The chapter proposes potential solutions to each of the challenges identified. To move forward, the practical steps required to roll out NHI need to be articulated more clearly and an NHI roadmap must be finalised urgently, outlining timeframes and assigning responsibilities for key activities and deliverables.

Establishing the NHI Service Benefits Framework



Arguably, one of the reasons for the slow rate of progress on National Health Insurance (NHI) implementation is the absence of an explicit list of conditions and healthcare services to be covered under NHI.



The aim

This chapter provides an overview of the process of developing the Service Benefits Framework (SBF) that defines the service benefits to be provided under NHI. The chapter also discusses the role of the Framework in supporting good governance in benefit design, and lessons learnt to develop the Framework further.



Developing the NHI Service Benefits Framework

Development of the Framework has included the following steps:

Defining services and care pathways: A set of easy-to-communicate service benefits was established by linking health conditions and services as defined in the national clinical guidelines with at-risk populations, and translating the care pathways associated with each condition and service from clinical terminology into lay-person terms.

Developing a costing structure: A costing database was developed to estimate the resource inputs required to deliver every healthcare service as reflected in existing national policy. The estimates include direct and shared clinical resources required per patient visit.

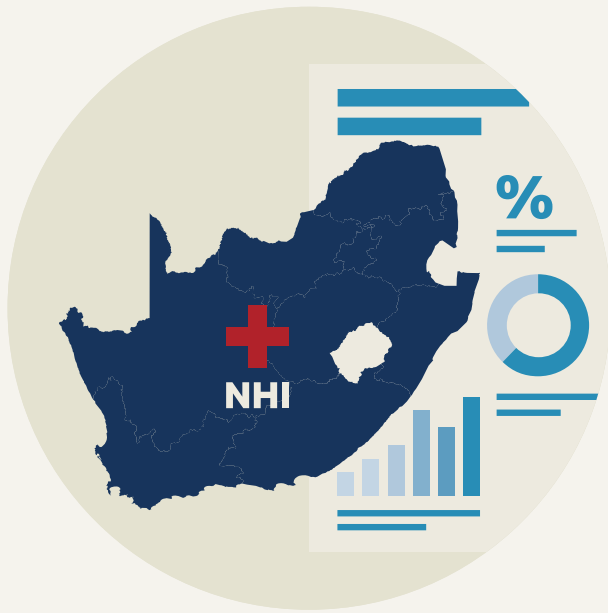


Lessons learnt

Several lessons learnt can inform how the SBF is developed further:

- Stakeholder engagement is critical in benefit design, including ongoing review.
- The SBF requires some restructuring to include standardisation of nomenclature and classification systems that make it fit for purpose.
- Processes should be standardised and aligned proactively for the development of national policy, strategy and guidelines, and the supporting health management information systems aligned with these documents.

Measuring National Health Insurance



Over the last 21 years provision of essential health services has improved in South Africa and there has been progress in reducing inequity of access. More needs to be done to ensure access for all South Africans, and to improve quality of services for better treatment outcomes and effective coverage.



The aim

This chapter analyses Universal Health Coverage (UHC) trends and highlights progress in the implementation of National Health Insurance (NHI) towards UHC. It also identifies current information gaps and the implications of these gaps for measurement of NHI in South Africa.



Key findings

South Africa is currently in the second of three phases of NHI implementation. Measuring the transition towards UHC through NHI implementation has been challenging, with many data gaps and serious implications for information systems and measuring progress in the future.



Conclusion

Although South Africa has increased population coverage of healthcare service delivery, challenges have persisted with coverage quality and health systems implementation. Much more will be needed to support the realisation of UHC through NHI implementation, with some key imperatives required including measurement of treatment outcome cascades in order to ensure effective UHC in the future.

Achieving a high-quality health system



The legislative and policy foundation for a well-performing health system in South Africa is largely in place. Strong stewardship, leadership and implementation are the logical next steps to build on the global momentum towards high-quality UHC.



The aim

Drawing on the South African Lancet National Commission Report, this chapter summarises the progress made in the provision of health care and the significant challenges that remain. It describes the methodology used in the Report, as well as the conceptual framework and definition of a high-quality health system in South Africa.



Methodology

The methodology used in the South African Lancet National Commission Report includes:

- Literature review on high-quality health systems
- Interviews with 10 key informants
- Monthly commission meetings, including deliberation on the evidence obtained and inputs received
- Inclusion of the findings and recommendations of three global reports on quality
- Four national consultative workshops held with stakeholders and technical experts.



Conceptual framework

The Report defines what a high-quality South African health system is and anticipates that the outcomes of such a system will include universal access and coverage, quality of care, and responsiveness to patient and community needs and inputs. A conceptual framework is used to highlight the progress of the South African health system, with six key diagnostic findings provided on its present state.

The Health Market Inquiry



The South African private health sector has developed uncompetitively, to the detriment of consumers. Recommendations made in the Health Market Inquiry (HMI) report provide an opportunity to build national capacity for a more rational and equitable healthcare system in South Africa.



The aim

This chapter reviews selected system-wide South African private health sector recommendations made in the recently released HMI report. The chapter focuses on recommendations relevant to more equitable health-systems development in the country.



Key findings

The HMI found that private health care in South Africa is characterised by high and rising costs in a predominantly fee-for-service market. Given multiple market failures, government intervention is required to ensure that consumers are protected. Findings were reported in three categories: facilities, practitioners and funders.



Recommendations

The HMI recommendations are aligned with the ambitions of the NHI Fund. They include:

- Extending demand-side regulation and introducing a new tariff negotiation regimen
- Re-organising existing supply regulatory functions into one body
- Improving value-based purchasing through health technology assessment and outcomes monitoring
- Improving the licensing of hospitals and the practice code numbering system; and investment in and national standardisation of the healthcare intervention codes
- Providing an immediate solution for fee-for-service-price determination between funders and individual practitioners through a multi-lateral negotiating forum while leaving space for innovation on value-based contracts through bilateral negotiations between funders, practitioners and hospitals.

Optimising beneficiary choices



The lack of transparency for medical scheme beneficiaries may lead to suboptimal decision-making by consumers and a less-responsive national healthcare system.



The aim

This review investigates non-health price barriers and their impact on beneficiary benefit option choices. It provides a standardisation policy framework that could improve decision making by beneficiaries and thereby strengthen the national healthcare system.



Methodology

Using data from the Council for Medical Schemes, this review applied empirical methods to test the existence of non-price barriers. Emerging health economics literature was also studied, with a series of analyses applied to the data (descriptive, discriminant and cluster).



Key findings

Benefit option decisions are difficult for consumers. The dimensions used to configure utilisation rationing mechanisms, such as co-payments, levies and deductibles, also add confusion to the decision-making process.



Conclusions and recommendations

Health information exchanges can address selection problems through providing relevant and standardised information. Medical schemes should dovetail their health service benefits with those of the NHI, incrementally phasing in the health service regimen to cover supplementary and complementary healthcare services. There ought to be room for private-public partnerships to augment the administrative and financing capacity of the state with regard to long-term diseases.

Expanding breast cancer care through partnerships and innovation



Clinicians have developed a multi-pronged strategy to increase capacity for breast cancer diagnosis and treatment at the Groote Schuur Hospital Breast Clinic.



The challenge

The number of breast cancer cases at Groote Schuur Hospital (GSH) increased from 320 in 1999 to 608 in 2017. Clinical resources do not match this higher workload at any point of service delivery, resulting in significant delays in diagnosis and treatment.



The aim

This chapter outlines the strategies employed by the GSH breast cancer team to manage increasing demands on clinical resources, and considers long-term interventions needed to resource breast cancer care nationally.



Key developments

Improving breast cancer-related services has involved several strategies:

- Establishment of a satellite breast cancer clinic at Mitchells Plain Hospital
- Reduction in the number of follow-up patients, and emphasis on new referrals
- Establishment of a virtual telephone clinic
- Partnership with two NPOs: PinkDrive and Project Flamingo.



Recommendations

The growing cancer epidemic in South Africa requires:

- Concrete national policies around control and management of breast cancer
- Establishment of one-stop breast clinics at all district and secondary hospitals
- Streamlined flow between district diagnostic services, regional surgical services and tertiary oncology and multidisciplinary team services.

Quality standards for hypertensive disorders in pregnancy



South Africa has high levels of maternal mortality, with hypertensive disorders of pregnancy being the main underlying cause of maternal deaths from 2014 to 2016.



The aim

This review describes the process of developing Quality Standards (QS) for maternal health in South Africa, aimed at improving the management of hypertensive disorders in pregnancy at primary care level. It also outlines lessons learnt and provides recommendations for moving forward.



Methodology

Seven QS were developed by a multi-disciplinary working group by October 2018. These QS were informed by recommendations from the national clinical practice guideline for maternity care and other local and international evidence.



Key findings

QS can bridge the gap between clinical guidelines and their successful implementation. To ensure their success, QS should be:

- Adapted to local conditions such as available skills at facility and district levels
- Developed with engagement of all key role-players and continuous stakeholder involvement
- Focused on local priorities
- Funded for implementation in different healthcare settings.



Conclusions and recommendations

QS can be developed relatively quickly through a stakeholder engagement process. A pilot study is the next step to examine the process of implementation and/or the impact of QS in practice. Successful implementation requires application of several principles including: partnerships and political support; baseline data; training; and documentation.

Understanding barriers to HIV testing and treatment



South African men experience several barriers to HIV testing and treatment that result in worse HIV-related outcomes than found in women.



The aim

This study explores men's experience of accessing HIV services and the experiences of healthcare providers delivering such services, to understand why men at risk often do not test or seek treatment for HIV.



Research approach

Men and healthcare providers (HCPs) from KwaZulu-Natal and Mpumalanga took part in a two-hour in-depth interview to gather data around their experiences of seeking or providing HIV-related health care. The men were at different stages of HIV testing and treatment and the HCPs had experience providing HIV care to men in various healthcare settings.



Key findings

Barriers faced by men include social and cultural norms, the cost/benefit trade-off when engaging with healthcare services, fears around relationships and identity, and past trauma around HIV.

Interactions with HCPs may also present barriers, such as distrust and misunderstanding, issues around counselling and initiating HIV testing, and fears around privacy.



Recommendations

Healthcare services should:

- Take a harm-reduction and empathetic approach
- Understand HCP barriers and challenges
- Be as responsive and relatable as possible
- Prioritise privacy, confidentiality and disclosure support.

A landscape analysis of preterm birth



Preterm birth (PtB) is a syndrome that affects millions of infants annually, with implications for short- and long-term morbidity, mortality and socio-economic liability.



The aim

Using national data sets, this chapter highlights the estimated global, regional and local burden of PtB; challenges with measuring gestational age; PtB-associated complications; and optimal care packages. The chapter also addresses key interventions that prevent and predict PtB, and interventions to manage preterm infants.



Findings

Estimation of PtB has been complicated by a lack of data availability, and inconsistency between PtB definitions across sites. Key interventions, namely kangaroo mother care and antenatal steroids, are effective but not consistently implemented.

Improving the wellbeing of mothers and infants necessitates interventions that target prevention, diagnosis and short- and long-term management. Many of these interventions exist in South African policy but uptake is variable across settings.



Recommendations

The authors support the five objectives of the South African Every Newborn Action Plan, and further recommend the following:

- Address the equipment and supplies gap in the public sector
- Address leadership and governance challenges affecting quality of care
- Provide appropriate training, support and supervision for healthcare workers
- Prioritise key research areas.

Improving the early development of children



Children who receive nurturing care, especially during the first 1 000 days, are more likely to reach full developmental potential and to lead healthy, productive lives.



The aim

This chapter reviews global and national strategies promoting the health, nutrition, development and well-being of young children. It covers the Side-by-Side Campaign implemented by the South African National Department of Health (NDoH) to promote Early Childhood Development (ECD) during the first 1 000 days. The chapter also outlines efforts by the health system to fulfil the 'survive and thrive' agenda for young children.



Key findings

The NDoH has begun the process of re-engineering child health service provision, guided by six main national and international policies and commitments. These policies position the health sector as primarily responsible for spearheading provision of services for young children (0 - 2 years).



Conclusion

Many South African children face continued risk of poor development. Going forward, the health sector has both the obligation and the opportunity to develop and implement a more comprehensive understanding of and approach to child well-being. Substantial changes in how services are organised, delivered and monitored must happen in order to break repeated cycles of adversity, and improve the health, nutrition and well-being of South Africa's children.

Achieving universal health coverage for adolescents



Despite the availability of progressive adolescent-related policies and initiatives in South Africa, implementation challenges exist and are impeding progress towards the achievement of universal health coverage (UHC) for adolescents in the country.



The aim

This chapter reviews progress towards achieving UHC for adolescents within the South African public health sector. It summarises the health risks faced by adolescents, and reviews policies and initiatives that deliver adolescent-responsive, quality health services and create demand for health care among adolescents in the country.



Key findings

For adolescents to benefit from South Africa's progressive human-rights-based policies, healthcare providers must be better prepared to respond to their health needs, and adolescents and young people must be prioritised in global health and social policy. Achieving UHC and optimal health for adolescents will require multi-sectoral collaboration to reduce the number of adolescents who are not employed, educated or in training, and to implement specific health-related interventions.

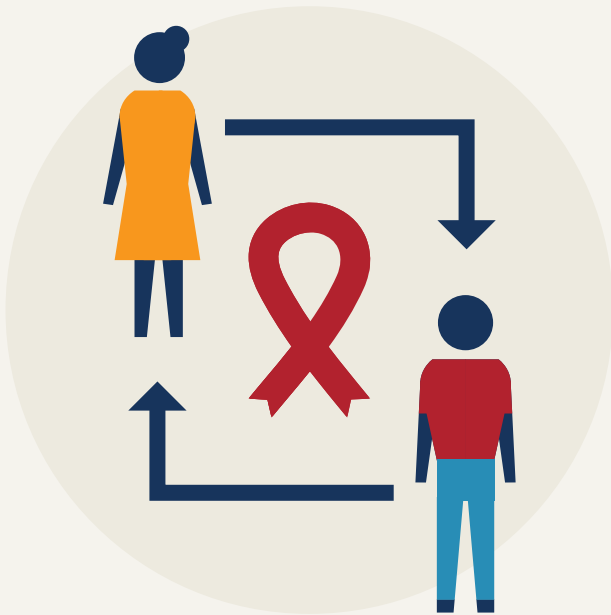


Recommendations

Recommendations include:

- Monitoring and review of South Africa's adolescent-specific policy and programme implementation
- Training of healthcare providers to be adolescent-competent
- Screening and early identification of risk factors among adolescents
- Strengthened referral systems and preventive programmes.

HIV prevention in high-risk adolescent girls and young women



Uptake and adherence to HIV prevention among adolescent girls and young women (AGYW) is often limited by management and preservation of their sexual relationships.



The aim

This chapter identifies the factors influencing the uptake and effective use of HIV prevention, including healthy and habitual HIV prevention behaviours, among AGYW.



Methodology

A sequential mixed-methods study using human centred design and behavioural economics was conducted to explore the decisions and behaviours of AGYW in KwaZulu-Natal and Mpumalanga. The key drivers and barriers to their uptake of HIV prevention behaviours and products were also investigated.



Key findings

- For AGYW, relationship management and preservation are the most important factors driving decision-making around HIV prevention.
- Some barriers to HIV prevention in AGYW include social norms, lack of supportive networks, and their dynamics with male partners, matriarchs and healthcare providers.
- A five-step journey towards achieving healthy relationship management and sexual health was identified for how HIV prevention awareness could be developed.



Conclusions and recommendations

Creating HIV prevention strategies that resonate with AGYW requires an understanding of the factors influencing their decision-making and behaviour, particularly with respect to relationship management.

Population ageing in South Africa



The South African population is ageing rapidly. This increases the need for diagnosis and treatment of chronic diseases, which place a significant burden on the healthcare system.



The aim

This chapter reviews the existing research on ageing and health; examines the challenges this poses to health services; and makes recommendations for proactive planning and intervention to reduce the projected strain on the healthcare system.



Research approach

Stats SA population forecasts were used to assess ageing trends in South Africa. Private-sector data were used to model the possible impact of an ageing population on morbidity and expected healthcare expenditures.



Key findings

South Africa is currently underprepared to respond to increasing chronic disease burden and associated expenditure as the population ages. While population ageing is three times faster in low- and middle-income countries (LMICs) than in developed countries, little is known about the needs of the elderly and existing healthcare gaps in LMICs.



Recommendations

There is an urgent need for research, policy development, planning and implementation to address these challenges.

Suggested solutions include:

- Promotion of self-management and ageing in community settings
- Improved health system response to the needs of older persons
- Improved healthcare worker training
- Promotion of grant-in-aid uptake.

Clinical associates in South Africa



With the right supervision, and collaborative teamwork, clinical associates can contribute to the efficiency, effectiveness and equity goals of the South African health system and help to ensure that NHI implementation reflects a society based on justice, fairness and social solidarity.



The aim

This chapter refers to the Clinical Associate National Task Team Report and provides an overview of clinical associates in South Africa, including their training, scope of practice, and impact on the health system. The chapter provides a comprehensive strategy to increase awareness and understanding of the added value provided by clinical associates. It also considers the role of clinical associates and their contribution to the sustained improvement of the South African health system through the intended implementation of NHI.



Key findings

This chapter summarises the evidence and explores the use and contribution of clinical associates within the South African health system. With appropriate supervision, management, and collaborative teamwork, the clinical associate profession can contribute significantly to quality healthcare delivery and universal healthcare access.



Recommendations

The chapter makes the following recommendations to strengthen the professional role of clinical associates, and to enhance their contribution:

- Strengthen the role of the Professional Association of Clinical Associates in South Africa (PACASA)
- Review the Clinical Associate Scope of Practice and prescription regulations.
- Increase employment numbers/posts for clinical associates
- Develop a human resources strategy for efficient and effective functioning of healthcare teams incorporating clinical associates
- Conduct job re-evaluation and re-grading for clinical associates in the public sector
- Implement an attractive professional career path
- Increase training of clinical associates.

A community worker's autoethnographic account



The contribution of community workers to health science student training and research should be better integrated into formal university and research functioning, and their knowledge of community dynamics should be recognised and utilised.



The aim

This chapter reflects on the challenges, lessons and experiences of a community worker living and working in her community. It describes the challenges of university-community partnerships in the context of university teaching and research requirements and the effects of these challenges on students and community members.



Key findings

Community workers serve as a bridge between institutions such as universities, and communities. To benefit from the valuable, collaborative partnerships linking health science education, research, and the communities they serve, it is important that often-invisible community liaison officers be recognised for their contribution and supported with necessary resources.



Recommendations

Recommendations are presented for decolonised and sustainable community engagement in health science education and research in the South African context.

- Strong and mutually beneficial relationships must be built and maintained among academics, researchers, students, and community workers.
- Researchers and academics must re-engage communities and brief community workers properly on projects before they commence.
- Educators must engage students in an action learning approach and involve community workers in planning community-engagement curricula.
- Universities must be able to hire community liaison officers based on skills and qualities, and they should provide stipends for these workers.

Health, HIV and TB resource allocation and utilisation



The South African health budget allocations to HIV and TB increased from R11 billion in 2013/14 to R20.7 billion in 2018/19.



The aim

This chapter analyses trends in health, HIV and TB budgets and expenditures to understand the allocation and utilisation of investments towards the sustainability of the National Strategic Plan for HIV, TB and Sexually Transmitted Infections.



Methodology

Financial reports on HIV and TB budgets and expenditure were extracted from several national and international data sources and a multisectoral review of HIV and TB spending was conducted from these records. An automated tool was also built to extract HIV and TB transactions from the Basic Accounting System of the South African Government (SAG).



Key findings

HIV and TB are highly prioritised in health spending. The results show that:

- Allocations for HIV and TB have grown by 7% annually and are set to surpass R25 billion in 2020/21.
- The SAG accounted for 76% of total spending, followed by the US Government and the Global Fund. Donor commitments to HIV and TB in South Africa remain strong.



Conclusions and recommendations

HIV and TB budget allocations are expected to grow in the near future. These results inform the management and planning processes of national and international funders, and contribute to improved understanding of efficiency and equity.

Health legislation and policy

Authors

Andy Grayⁱ
Yousuf Vawdaⁱⁱ

The radically transforming terrain of health services demands a high degree of policy coherence, as well as visionary stewardship from government in a participatory and inclusive national effort.

In 2019, the National Health Insurance Bill was tabled, initiating the legislative steps necessary to enable Universal Health Coverage in South Africa. The Bill includes consequential amendments to many other Acts, including the National Health Act of 2003.

This chapter provides a detailed and critical examination of the Bill. The implications for existing constitutional allocations of responsibility for health are examined, with particular focus on the existing and anticipated arrangements for financing, governance and management, as well as public participation and engagement. The implications for the private sector are

explored, with additional consideration given to the final report and recommendations of the Competition Commission Health Market Inquiry.

A brief summary is provided of other health-related primary health legislation (in the form of Bills or Acts of Parliament), selected secondary legislation (Regulations published by the Minister of Health) and tertiary legislation (Board Notices issued by statutory health councils). Relevant major health-related jurisprudence is discussed, with a focus on the Constitutional Court's judgment with regard to cannabis use and its implications for drug policy.

i Division of Pharmacology, Discipline of Pharmaceutical Sciences, University of KwaZulu-Natal; World Health Organization Collaborating Centre on Pharmaceutical Policy and Evidence Based Practice
ii School of Law, University of KwaZulu-Natal

Introduction

The Sustainable Development Goals (SDGs), which were agreed to by the United Nations in 2015, set 17 broad areas of development and targets to be achieved by 2030.¹ In the area of ‘Health’ (SDG3), Goal 3.8 includes a commitment to achieve universal health coverage (UHC).² The South African response to this challenge is encompassed in the proposals for National Health Insurance (NHI).

There were no attempts to create a unified health system for all citizens of the country during the apartheid era, and the proposals of the 1940s Gluckman Commission were never implemented.³ One of the first major policy documents issued in the democratic era was the 1997 White Paper on the Transformation of the Health System in South Africa.⁴ The preface to the White Paper opened with a clear statement of intent, but also a recognition of the enormity of the task ahead: “We have set ourselves the task of developing a unified health system capable of delivering quality health care to all our citizens efficiently and in a caring environment”. In addition to a commitment to Comprehensive Primary Health Care, the White Paper expressed a preference for decentralised management, in the form of a district health system, and sought to “integrate the activities of the public and private health sectors, including NGOs and traditional healers” and to “foster community participation across the health sector”.

The path from the 1997 White Paper to the current stage of development of NHI has not been simple, linear or uncontested. Various ministerially appointed policy committees have developed proposals for Social Health Insurance, Comprehensive Social Services, and ultimately for NHI. This process has been interwoven with the equally contested, and protracted, process of replacing apartheid-era health legislation with, inter alia, the National Health Act (61 of 2003).⁵ Although the National Health Act (NHA) has already been amended once,⁶ it has not yet been brought into effect in its entirety. In particular, the highly contested chapter 6 (sections 36 - 40) was prematurely promulgated, before the necessary regulations were in place, and that promulgation was reversed by the Constitutional Court in 2015.⁷ No further attempt to bring these provisions into effect has yet been made.

After the publication of a Green Paper on National Health Insurance in 2011,⁸ a White Paper followed in 2015.⁹ Somewhat unusually, a subsequent policy document followed in 2017,¹⁰ accompanied by a Gazette notice about the “institutions, bodies and commissions” to be created to enable its implementation.¹¹ Although these structures have not been appointed, the internal policy development process within government has continued. In particular, the central role of the Minister and the National Department of Health (NDoH) has been shifted to the Presidency, and an

‘NHI War Room’, headed by a previous Director-General.¹² Senior staff of the NDoH have been seconded to the ‘War Room’, with the expected challenges to lines of reporting and authority.¹³ More recently, Dr Nicholas Crisp has been appointed by the Minister of Health to manage a new NHI office.¹⁴

This analysis focuses, primarily, on the content of the NHI Bill (11 of 2019), published on 6 August 2019.¹⁵ A draft NHI Bill was published for public comment in June 2018,¹⁶ and elicited 197 written submissions. The Bill has been proposed as a section 76 Bill (an ordinary Bill affecting the provinces), which implies that public hearings will not only be held by the National Assembly Portfolio Committee on Health, but also in the provinces.

National Health Insurance Bill, 2019

This analysis of the NHI Bill focuses specifically on the provisions describing the governance of the proposed NHI Fund and its relationship with governance and management bodies created in terms of the NHA. In addition, it draws on two publicly accessible inputs: the Hospital Association of South Africa’s (HASA) input on the White Paper,¹⁷ and the SECTION27/Treatment Action Campaign (TAC) submission on the draft Bill.¹⁸ Unlike the Competition Commission’s Health Market Inquiry (HMI), the NDoH does not make submissions received in response to policy documents or draft Bills publicly accessible.^a The two submissions cited represent widely differing positions on key issues.

Following publication of the NHI Bill, numerous opinions have been proffered, both in favour of and in opposition to its contents. Two other documents are inextricably linked with the Bill: the report on the Presidential Health Compact,¹⁹ released in July 2019, and the external evaluation report on the phase 1 NHI pilot projects,²⁰ released in the same month. Importantly, the latter noted that “[t]he first phase of NHI did not involve developing new funding arrangements for health care in South Africa, but rather piloted various health system strengthening interventions focused at the primary health care (PHC) level”. Attempting to predict the feasibility of the proposed NHI reforms on the basis of these limited health systems strengthening interventions in 10 districts is therefore questionable. Lastly, in late September 2019, the final findings report and recommendations of the HMI were released.²¹

Preamble and definitions

The preamble to the Bill echoes the key elements of UHC (access to quality services, and financial protection), but also of the 1997 White Paper, in that it seeks to “create a single framework throughout the Republic for the public funding

a The submissions received in response to the Competition Commission’s HMI provisional report are accessible at <http://www.compcom.co.za/12138-2/>

and public purchasing of health care services, medicines, health goods and health related products, and to eliminate as far as is reasonably possible the fragmentation of health care funding in South Africa”.

The definitions in a Bill should, where possible, be in concert with the terminology in related legislation. The Bill includes a new variant to the term “health care provider” (defined in the NHA as a registered health professional), namely “health care service provider”, defined as “a natural or juristic person in the public or private sector providing health care services in terms of any law”.

Two other definitions are key to understanding the Bill: “‘health goods’, in respect of the delivery of healthcare services, includes medical equipment, medical devices and supplies, health technology or health research intended for use or consumption by, application to, or for the promotion, preservation, diagnosis or improvement of, the health status of a human being”; and “‘health related product’ means any commodity other than orthodox medicine, complementary medicine, veterinary medicine, medical device or scheduled substance which is produced by human effort or some mechanical, chemical, electrical or other human engineering process for medicinal purposes or other preventive, curative, therapeutic or diagnostic purposes in connection with human health”. Unless these terms and their definitions are aligned and standardised by consequent amendments to the Bill and related legislation, these anomalies will continue to cause confusion or, worse, result in litigation.

Purpose and application

Chapter 1 of the Bill deals with the purpose and application of the Act, re-stating the goal of a single purchaser and single payer system, applicable to all health establishments other than those serving the military and State Security Agency. Section 3(3) proposes a hierarchy of legislation, in that “If any conflict, relating to the matters dealt with in this Act, arises between this Act and the provisions of any other law, except the Constitution and the Public Finance Management Act or any Act expressly amending this Act, the provisions of this Act prevail”. This immediately challenges the status of the NHA, as the overarching piece of health legislation defining the structure and function of the health system, despite the following section: “The Act does not in any way amend, change or affect the funding and functions of any organs of state in respect of health care services until legislation contemplated in sections 77 and 214, read with section 227, of the Constitution and any other relevant legislation have been enacted or amended”.

Section 77 of the Constitution deals with money Bills, whereas section 214 governs the allocation of resources in terms of the equitable share concept and section 227 covers sources of provincial and local government funding. The Constitution has allocated concurrent competency for “Health services” to the national and provincial spheres, with the NHA clarifying what is meant by “municipal health services”, allocated to the local government sphere.²²

The 2016 HASA input on the White Paper focused on the restrictions to be placed on the private sector, argued that these “infringe upon or unduly limit fundamental rights contemplated in the Constitution”, including “the right to freedom of association in section 18 of the Constitution as well as the rights to self-determination and security of a person in section 12”.¹⁷

The SECTION27/TAC response to the draft Bill took a different line, arguing that the “proposals are neither coherent nor are they reasonably conceived”, and therefore that implementation as proposed “risks regression in access to health care services, a violation of section 27 of the Constitution”.¹⁸ The most significant change regarding the provinces is the proposed shift of the provincial equitable share of funds to the NHI Fund. The current situation has been criticised for the inability of the NDoH to monitor and direct appropriate distribution of these funds to pressing health needs, such as human resources, hospital maintenance and outreach services.²³ The proposed shift holds the prospect of improved allocation for urgent health interventions, particularly in resource-poor settings.

Access to services

Chapter 2 of the Bill describes access to healthcare services funded by NHI, and specifically limits access for asylum seekers and “illegal foreigners” to emergency medical services and those required for “notifiable conditions of public health concern”. Visitors without health insurance would also have access only to these limited services. The most contentious component of the chapter is that related to the future role of medical schemes. In terms of section 6(o) a user may purchase services that are not covered by the Fund through a “complementary voluntary medical insurance scheme register in terms of the Medical Schemes Act, any other private health insurance scheme or out of pocket payment”. Section 58 of the Bill enables consequent amendments to other legislation, as listed in the Schedule. The proposed amendment to the Medical Schemes Act (131 of 1998) would alter the definition of the “business of a medical scheme”, restricting such schemes to services “not covered by” NHI. This change would fundamentally alter the functioning of medical schemes over time (section 58 is also subject to the phased transition covered in section 57 of the Bill). Section 33 states: “Once National Health Insurance has been fully implemented as determined by the Minister through regulations in the Gazette, medical schemes may only offer complementary cover to services not reimbursable by the Fund”. Importantly, section 3(5) of the Bill states that the Competition Act (89 of 1998) is not applicable to any transactions concluded in terms of the NHI Act, presumably clearing the way for tariff-setting and collective engagement with healthcare service providers.

Governance of the NHI Fund

The key institution created by chapter 3 of the Bill is the NHI Fund, established as an “autonomous public entity”, in accordance with Schedule 3A of the Public Finance

Management Act (1 of 1999). Whether the Fund, as proposed, fundamentally alters the co-operative governance of health, as required by the Constitution and enshrined in the NHA, is open to question. Governance of the NHI Fund is to be entrusted to an independent Board, that is, nonetheless, “accountable to the Minister” (section 12). Whereas the draft Bill stated that members of the Board would be “recommended by the Minister of Health and appointed by the Cabinet” (section 14), the final Bill now entrusts this process entirely to the Minister (section 13), following a process of public nominations.

The question that arises is whether this process would yield a Board that is truly independent, and free from any political influence. In particular, one of the Board members is specifically appointed to represent the Minister. The requirements for appointment are largely technical (“appropriate technical expertise, skills and knowledge or experience, including health care financing, health economics, public health planning, monitoring and evaluation, law, labour, actuarial sciences, information technology and communication”). While the draft Bill stated that the chairperson and deputy would be chosen by the Board, the final Bill now enables the Minister to appoint the chairperson. Neither option is sufficient to ensure that no ‘sand’ fouls the gears of this multi-billion Rand Fund. There are other tell-tale signs of intended close engagement: for example, the Board is enjoined to “inform the Minister of any advice it gives to the Chief Executive Officer” (section 15(4)(d)). The Board may only determine its own procedures “in consultation with the Minister” (section 17).

One possible alternative is to construct a Board from representatives of key stakeholders. A 2017 input prepared for the High Level Panel on the Assessment of Key Legislation and the Acceleration of Fundamental Change argued that “[a]s the NHIF will be tax funded, it is not appropriate to appoint members representing specific interest groups”.²⁴ The source for that advice was a World Bank document that described the elements of effective governance as including, among others, that “[s]takeholders have effective representation in the governing bodies”.²⁵ This source recommended that the governance structures of mandatory health insurance (MHI) bodies include “representatives of government agencies, regulatory bodies, MHI entities, unions, employers’ organizations, beneficiaries, providers, and independent experts”. The authors recognised the risks, stating: “The representation of stakeholder interests can be functional or dysfunctional depending on which groups it includes and in what proportion; beneficiaries, employers, and medical professionals each often bring different perspectives regarding cost containment and financial sustainability versus service provision. To be successful, representation should attempt to achieve inclusiveness, participation, and consensus orientation”.

Principle 7 in the King IV Report would seem to offer a way forward: “The governing body should comprise the appropriate balance of knowledge, skills, experience, diversity and independence for it to discharge its governance role and responsibilities objectively and effectively”.²⁶ It would seem premature, therefore, to construct a governance body only of technical experts, and preclude the balancing inputs of stakeholders, including government agencies and regulatory bodies, such as the Council for Medical Schemes, let alone beneficiaries and healthcare providers. Nonetheless, the principle that needs to be emphasised is that the required “objectivity and effectiveness” can only be achieved if the appointees (whether “expert” or drawn from particular stakeholders) bring their experience and expertise into, but leave their stakeholder interests outside, the boardroom.

Management and structures

The Chief Executive Officer (CEO) of the Board is to be appointed through a convoluted process. After interviewing shortlisted candidates, the Board would forward recommendations to the Minister “for approval by the Cabinet”. The Minister would inform Parliament of the appointment within 30 days, and give notice in the Government Gazette. The notion of overly close engagement is continued in section 21, which requires the CEO to meet with the Minister, Director-General of Health and CEO of the Office of Health Standards Compliance (OHSC) at least four times per year, yet still be accountable to the Board. The CEO may not appoint or dismiss executive management staff without the prior written approval of the Board (section 22). The CEO is also enjoined to report to Parliament annually (section 20(1)(d)). Confusingly, section 51(1) requires the Board to submit an annual report to the Minister and Parliament, and section 51(4) requires the Minister to “without delay” table a copy of the report in both the National Assembly and National Council of Provinces.

The degree to which community participation in planning and decision-making is enabled by the Bill can be explored with reference to the proposed ministerial committees. How these would differ from the technical committees that the Board is entitled to appoint (section 24) is unclear, as these would not be sub-committees of the Board, composed only of Board members, but would involve external appointees. Chapter 7 of the Bill (sections 25 - 30) outlines three specified committees, and then the ability to establish additional technical committees. Section 29 requires the Minister to gazette the “composition, functions and working procedures” for any committee established under this chapter. While no size is stipulated for the Benefits Advisory Committee or the Stakeholder Advisory Committee, the Health Care Benefits Pricing Committee is to be composed of no fewer than 16 members and no more than 24. The remit of each committee and the requirements for membership/representation are shown in Table 1.

The role of these advisory structures is complicated by the additional structures outlined in the transitional arrangements (section 57). A particularly ill-advised decision has seen the inclusion of timelines in the Act itself (Phase 1: 2017 - 2022; Phase 2: 2022 - 2026). In Phase 1, the following interim structures are prescribed:

- National Tertiary Services Committee;
- National Governing Body on Training and Development;
- Ministerial Advisory Committee on Health Care Benefits for NHI (as a precursor to the Benefits Advisory Committee); and
- Ministerial Advisory Committee on Health Technology Assessment for NHI (as a precursor to the Health Technology Assessment Agency, which is mentioned nowhere else in the Bill).

It is only in Phase 2 that “selective contracting of health care services from private providers” will commence.

Interestingly, while the Stakeholder Advisory Committee appeared to be an optional structure in terms of the draft Bill (the Minister “may appoint”), and its remit also appears to be limited to advice and comments without any decision-making power, the composition is now to be prescribed, and the remit is unstated. In addition, it is unclear how this body would differ from the National Consultative Health Forum already established in terms of the NHA.

In the draft Bill, the appointment of technical committees was not only optional, but would occur only “after consultation with” the National Health Council (NHC). That the private sector has no representation on the NHC, as constituted by the NHA, was seemingly ignored. A larger

question was left unanswered, namely: what is the place of the NHC in a health system unified under NHI where the majority of funds for healthcare services are not disbursed by means of the equitable share formula to the provinces? The attempt in the final Bill to resolve this conundrum is less than convincing. Firstly, section 31 attempts to define the role of the Minister as being “governance and stewardship of the national health system” and “governance and stewardship of the Fund”. These two allocations are followed by an instruction that the Minister “must clearly delineate in appropriate legislation the respective roles and responsibilities of the Fund and the national and provincial Departments, taking into consideration the Constitution, this Act and the National Health Act”.

SECTION27/TAC expressed their concern directly in relation to the construct in the draft Bill: “Having all health funding and most decisions on health largely in the hands of one politician is dangerous”.¹⁸ The powers of the NDoH are described as being those provided by the NHA (section 32). However, it is the powers of the provincial Departments of Health that seem to be most severely constrained, although the detail is left for later amendments: “Without derogating from the Constitution or any other law, the functions of a provincial Department must be amended to comply with the purpose and provisions of this Act, subject to the provisions of section 57”. The Minister of Health is enabled to intervene directly in provincial affairs, by for example, designating “provincial tertiary and regional hospitals or groups of hospitals as autonomous legal entities accountable to the Minister through regulation” (section 32(2)(b)). Most importantly, the Minister will establish the District Health Management Offices (DHMOs) as “government components

Table 1: Ministerial Advisory Committees for the NHI Fund to be established in terms of Chapter 7 of the NHI Bill, South Africa, 2019

Ministerial Advisory Committee	Membership	Remit
Benefits Advisory Committee	Persons with expertise in medicine, public health, health economics, epidemiology, and the rights of patients. One member to represent the Minister.	To determine, in consultation with the Minister and Board, the health service benefits provided by the NHI Fund, at each level of care. To “determine and review” “detailed and cost-effective treatment guidelines that take into account the emergence of new technologies”.
Health Care Benefits Pricing Committee	Persons with expertise in actuarial science, medicine, epidemiology, health management, health economics, health financing, labour and rights of patients. One member to represent the Minister.	To recommend the prices of health service benefits to the Fund.
Stakeholder Advisory Committee	Representatives from the statutory health professions councils, health public entities, organised labour, civil society organisations, associations of health professionals and providers as well as patient advocacy groups.	Not explicitly stated.

to manage personal and non-personal health care services” (section 32(2)(c)). Section 36 further emphasises that the DHMOs are a “national government component”, established by a new section of the NHA (section 31A), and entrusted to “manage, facilitate, support and coordinate the provision of primary health care services” at district level. Whereas the NHA required the head of a provincial department to “control the quality of all health services and facilities” in the province, this is altered to read “assist the District Health Management Office in controlling” such quality.

Contracting for services

A key design feature of the proposed Fund is that of a purchaser-provider split. Section 35(2) indicates that the Fund must transfer funds directly to “accredited and contracted central, provincial, regional, specialised and district hospitals based on a global budget or Diagnosis Related Groups”. In addition, funds for primary health care services must be transferred to Contracting Units for Primary Health Care (CUPs) “at the sub-district level”. The proposed disbursement mechanism specifically excludes the provincial authorities. How private hospitals might fit into this process is unclear, as their designation fits none of the categories listed.

It is at the primary health care level that the proposed system is most difficult to fathom. Section 35(3) stipulates that at the sub-district level funds are to be transferred to CUPs. Section 36 then describes the role of the DHMOs, which do not yet exist (being introduced by the consequent amendment to the NHA). Section 37 returns to the role of the CUPs, described as being “comprised of a district hospital, clinics or community health centres and ward-based outreach teams and private providers organised in horizontal networks within a specified geographical sub-district area”. As the SECTION27/TAC input notes, “the national structure (the Fund) pays a sub-district level structure (the CUP) which then pays contracted providers (owned privately, by the province, or by the municipality)”.¹⁸

SECTION27/TAC further notes that the CUPs will need to be “sophisticated and multi-skilled structures, capable of performing an extensive role”. The Bill therefore describes the CUPs as including the full range of potential contracted providers, not a structure capable of a highly technical role. The confusion between which body is contracted by the Fund and which body is engaged in the process of the contracting of providers (both public and private) is also revealed in section 41(3)(a), which states that “an accredited primary health care provider must be contracted by” a CUP. In contrast, section 39(3) states that the “Fund must conclude a legally binding contract with a health establishment certified by the Office of Health Standards Compliance”.

Clearly the CUPs are an integral element of the Fund, but they are also the structures to be contracted to deliver services. Further confusion appears in section 31B(6) inserted into the NHA: “To the extent that the Contracting Units for Primary Health Care are not adequately capacitated, the District Health Management Office must perform these functions on its behalf until such time as the Units have been sufficiently capacitated to fulfil their purpose as provided for in this section”. To date, neither the CUPs nor the DHMOs exist, nor have any such structures been explored or tested in the NHI pilot districts. To what extent contracting of providers will be centralised to the Fund or decentralised to DHMOs and/or CUPs therefore remains unclear.

A further new structure is to be created in the form of the Office of Health Products Procurement, to be established by the Board in consultation with the Minister, and “located within the Fund”. Confusingly, while the Benefits Advisory Committee is to be entrusted with developing “detailed and cost-effective treatment guidelines”, the Office of Health Products Procurement is tasked to “determine the selection of health related products to be procured” and “develop a national health products list”. It must also “coordinate the supply chain management process and price negotiations for health related products”. “Health related products” are specifically defined in the Bill as excluding medicines and medical devices, but “health products” are not defined (whereas “health goods” are and appear to include medicines and medical devices).

The process of selection is directly related to pricing, and the Fund is required to “negotiate the lowest possible prices for goods and health care services” (section 11(2)(e)). The Health Care Benefits Pricing Committee must “recommend the prices of health service benefits to the Fund” (section 26(3)). Section 38(4) attempts to outline the selection functions as follows: “The Office of Health Products Procurement must support the Benefits Advisory Committee in the development and maintenance of the Formulary, comprised of the Essential Medicine List and Essential Equipment List as well as a list of health related products used in the delivery of health care services as approved by the Minister in consultation with the National Health Council and the Fund”.

Importantly, section 38(6) states: “An accredited health care service provider and health establishment must procure according to the Formulary, and suppliers listed in the Formulary must deliver directly to the accredited and contracted health service provider and health establishment”. In this regard, the proposed amendment to the Medicines and Related Substances Act (Act 101 of 1965) has enormous implications for the procurement and supply of medicines in particular. Where previously the single exit

price (SEP) was defined in section 22G of that Act as being the “only price at which manufacturers shall sell medicines and Scheduled substances to any person other than the State”, this is amended to read “to the National Health Insurance Fund or any other person”.

The consequences for the current strict separation between state tender stock and private-sector medicines are wide-ranging and call into question the very *raison d’être* of the Centralised Chronic Medicines Dispensing and Distribution (CCMDD) programme. In the meantime, the current separation between the pricing of medicines for the public and private sectors continues, with recent Gazette notices providing for the SEP adjustment for 2019,²⁷ updated dispensing fees for pharmacists²⁸ and dispensing practitioners,²⁹ and exploring amendments to the methods of determining SEP adjustments in future.³⁰

Anticipated regulations

As is usual, the Bill lists an extensive set of regulations to be issued by the Minister, including on the “functions and power” of the DHMOs and CUPs. Two regulations raise questions: the requirement for regulations on the “relationship between public and private health establishments, and the optional contracting in of private health care providers”, and on the “relationship between the Fund and medical insurance schemes registered in terms of the Medical Schemes Act and other private health insurance schemes”. There is no clarity in the policy *per se*, in either the 2015 or 2017 versions, that can inform such regulations.

Consequential amendments

The NHI Bill also includes the proposed amendments to a number of other Acts once section 58 comes into effect (in the form of a listing of laws repealed or amended). Apart from the amendments already described, proposed amendments to the Health Professions Act and Allied Health Professions Act (but not to the Nursing Act or Pharmacy Act) are included, and deal with informing patients about services, and fees to be charged, that are “complementary” in that they are “not covered by the National Health Insurance Fund”.

What is not clear from the NHI Bill is whether medical schemes will be restricted to “complementary” services or allowed to provide “supplementary” or even “duplicative” services. Whether, as is argued in the HASA submission, the Constitution would allow the restriction of existing rights is open to question.¹⁷ It may well be that, as in the United Kingdom, those who wish to may be able to procure all healthcare services privately, and insure against such costs, provided that they also make a full contribution to the NHI Fund, however that will eventually be funded.

Congruence with the HMI?

Although the final findings report of the Competition Commission’s HMI is at pains to point out that its terms of reference were specific to the private sector, the report is clearly cognisant of the NHI Bill and the extent to which its

recommendations need to dovetail with the structures and processes envisaged under NHI.²¹ Nonetheless, the HMI has recommended the establishment of key structures that are not catered for in the NHI Bill, and which in some cases could be duplicative.

The HMI found that the private healthcare sector is currently “subject to distortions which adversely affect competition”, at the level of health facilities, funders and practitioners (p. 201). In particular it noted a “fragmented, poorly enforced regulatory system with weak oversight” of the supply side (p. 212), and accordingly recommended the establishment of an Independent Supply-Side Regulator for Healthcare (SSRH), using the existing enabling provisions in the NHA (section 3, read with section 90(1)(f)).

The SSRH is, among other functions, to be responsible for a strengthened health facility licensing regimen (replacing the current provincial systems, which mostly rely on regulations issued in terms of previous Health Acts). The proposed system would largely supplant that envisaged in chapter 6 of the NHA, which is not yet in effect. The SSRH would also take over the practice code numbering system currently operated by the Board of Healthcare Funders (BHF). In making these proposals, the HMI carefully explained how they would complement, not duplicate, the accreditation and inspectorate role of the OHSC.

However, the recommendation that the SSRH also take on the role of “economic value assessments”, described as akin to health technology assessment (HTA), is less easily located in relation to the proposals included in the NHI Bill (which are also confusing). Likewise, although the need for extensive data on all aspects of the health system is clear, the best location for the proposed “national health data repository” is unclear. The SSRH is also to enable the creation of a multilateral negotiation forum (MLNF) on health services pricing, a process that is also covered in the NHI Bill. In this regard the recommendation that all medical schemes offer a “single, stand-alone, comprehensive, standardised, obligatory base benefit package” (p. 236) has considerable overlaps with the NHI proposals on benefit package design.

The second key new structure to be established, as recommended by the HMI, is the Outcome Measurement and Reporting Organisation (OMRO), described as “a platform for providers, patients and all other stakeholders in the provision of healthcare to generate patient-centred and scientifically robust information on outcomes of healthcare”. Where the SSRH is proposed as a Schedule 3A public entity, the OMRO is envisaged to be an independent and collaborative structure, in the private not-for-profit space (p. 232). Noting that the NHI Fund plans to engage in “strategic purchasing”, which would rely on accurate data on health outcomes and the costs of care, the HMI argued that “OMRO is not only consistent with, but also essential to the operation of the NHI” (p. 206).

Questions of actors, process and context

The degree of uncertainty outlined in the analysis above points to the extent to which engagement by actors outside of the NDoH and Presidency has been severely limited to date. Although material differences between the draft and final Bill are discernible, the existing National Consultative Health Forum has not been used to its maximum potential. Two processes have had the potential to alter this dynamic considerably. The first was the establishment of the Competition Commission's HMI in 2014, which has gathered considerable materials,³¹ issued a draft report,³² and issued its final report and recommendations on 30 September 2019.²¹ There are indications that a wholesale amendment of the Medical Schemes Act of 1998 will only occur in response to that final report. The HMI process, in stark contrast to the NDoH-driven policymaking process, has placed all submissions received in the public domain.

In October 2018, a Presidential Health Summit was held, attended by more than 600 delegates.¹⁹ The report of that Summit lists fine intentions:

- “A coherent and aligned network of ‘structures’ across the health system that spread responsibility downwards in the hierarchy must be developed to improve accountability in leadership and governance”;
- “The community, including health service users must be actively engaged in the processes of unifying the health system”.

As outlined above, the NHI Bill fails to deliver those “structures”, or to meet the requirement for community engagement. Whether the public participation required in a section 76 legislative process will be able to fundamentally alter the final shape of the NHI Fund remains to be seen.

The President's State of the Nation Address in February 2019 contained a relatively lengthy exposition on the state of play, and specifically linked the NHI process to the quality improvement plan.³³ The outlines of that plan were released, in hard copy only, to a consultative meeting with stakeholders held in August 2018. The Draft National Quality Improvement Plan (NQIP) has not been placed in the public domain by the NDoH, but a scanned version is available.³⁴

Implementing the National Health Act

The draft NQIP includes a clear description of the evolution of quality standards applicable to health facilities, from the establishment of the OHSC (by the 2013 amendment of the NHA), through the development of the National Core Standards, to the publication of the regulated standards in February 2018 (which came into effect a year later).

However, most importantly, it contains this statement: “the plan is to enhance the rigor and depth of the regulated standards as experience is gained in the field”. A key part of this development programme is the extension of the Ideal Clinic Realisation and Maintenance (ICRM) programme to the Ideal Hospital Realisation and Maintenance Framework.³⁵ That document and process are still in draft form.

From an actor and process perspective, one of the most intriguing lines in the draft NQIP is this one: “There is already an internationally recognised healthcare facility accreditation organisation in South Africa that could offer the NHI an accreditation system”. It is assumed that this refers to the Council for Health Service Accreditation of Southern Africa (COHSASA), whose founder serves on the OHSC board.³⁶ A rapprochement between the NDoH leadership and this not-for-profit organisation, which has already engaged with a number of public-sector health facilities over the years, is apparent. However, whether the OHSC will render COHSASA obsolete remains to be seen.

The NQIP recognises the scale of the challenge of ensuring that the full range of health establishments meet accreditation standards, in order to be eligible for an NHI contract. In this regard, the final publication of the report of the South African Lancet National Commission, linked to the Lancet Global Health Commission on High-Quality Health Systems in the Sustainable Development Goals Era, is eagerly awaited.^{37,38}

The development of systems at the OHSC continues apace, with the publication of a Code of Conduct for Inspectors in January 2019.³⁹ In March 2019, this was followed by the publication of a draft Enforcement Policy for public comment.⁴⁰ This document is the first to mention the impact of the Protection of Personal Information Act (POPIA) of 2013, which is gradually coming into operation. Explorations of how the POPIA will impact various elements of healthcare practice are beginning to be published.⁴¹

The issuing of regulations in terms of the NHA has, however, slowed down perceptibly. In April 2018, a correction was published to a previous policy guideline on the Licensing of Residential and/or Day Care Facilities for Persons with mental Illness or Severe or Profound Intellectual Disability.⁴² Although this update can be viewed as evidence of a tightening of regulatory measures in the aftermath of the Life Esidimeni tragedy, the consequences of non-adherence to such instruments cannot be ignored.⁴³ In September 2019, the Minister designated “health establishments to provide acute care, rehabilitation and palliative care for cerebral palsy”, the majority of which are central hospitals.⁴⁴ These hospitals and hospital complexes are to provide care “in collaboration with each other”, and “at no cost to the patients”. In July 2018, the format of the Material Transfer Agreement of Human Biological Materials was stipulated.⁴⁵

Other health-related legislation: unfinished business

Following the 2019 General Election, a number of health-related Bills have lapsed. The National Health Laboratory Service Amendment Bill, first introduced in 2017, was passed by Parliament in February 2019, and assented to by the President as Act No. 5 of 2019.⁴⁶ However, the linked National Public Health Institute of South Africa Bill, also introduced in 2017, which passed its Second Reading in the National Assembly in August 2018 and was referred to the National Council of Provinces, has not progressed further.⁴⁷ Both have been described in a previous issue of the *Review*.⁴³

Two Private Member's Bills seeking to amend the NHA have also lapsed but could be revived. Bill 29 of 2018 was introduced by Dr S Thembekwayo, MP (EFF).⁴⁸ The Bill seeks to amend section 4 of the NHA, by adding a sub-section reading: "Clinics funded by the State must provide the services referred to in subsection (3) 24 hours a day and seven days a week". A more substantive proposed change has been tabled by Ms D Carter, MP (COPE), in the form of Bill 9 of 2019,⁴⁹ following the publication of an explanatory memorandum.⁵⁰ The Amendment Bill seeks to "provide for legal recognition, legal certainty and legal enforceability regarding advance health care directives such as the living will and the durable power of attorney for healthcare". It aims to "set out the purpose, scope and format for these advance health care directives and provide for the resolution of disputes related to such directives; clarify whether a 'living will' or a substitute decision-maker's decision may be overridden by a medical practitioner or family members in any circumstances; and clarify whether someone acting upon these directives is immune from criminal and civil prosecutions". The Bill appears to address some of the lacunae exposed by previous cases.⁵¹

No progress has been evident in relation to the draft Control of Tobacco Products and Electronic Delivery Systems Bill, published for comment in May 2018.⁵² However, it has been reported that the Bill has been referred to the state law advisors.⁵³ In this regard, South Africa has been rated as at high risk of interference from tobacco industry lobbying.⁵⁴

The State Liability Amendment Bill (16 of 2018) has also not progressed, after being tabled in the National Assembly in May 2018.⁵⁵ As noted in the last issue of the *Review*, "[w]hile ostensibly aimed at increasing the financial resources of state hospitals in order to provide healthcare services, this legislative attempt in no way addresses the fundamental issue of professional negligence that gives rise to the proliferation of malpractice suits".⁴³ As a section 76 Bill, this proposed amendment will need extensive debate in the provinces in order to pass constitutional muster.

Statutory health councils

In the year since the last *Review*, few legislative instruments have been issued by the statutory health councils, apart from those dealing with routine nominations/elections and the setting of fees. In March 2019, the Minister issued a confusing notice creating two categories of nurse practitioners, namely "enrolled nurse" and "general nurse", which do not appear to match previous categories established in terms of section 31 of the Nursing Act of 2005.⁵⁶ In April 2019, draft regulations were issued in terms of the Nursing Act, specifying the minimum requirements for education and training of learner/student midwives.⁵⁷ The same day saw the publication of the National Policy on Nursing Education and Training by the NDoH.⁵⁸

The South African Pharmacy Council (SAPC) published amendments to the Good Pharmacy Education Standards (Higher Education and Training) in March 2019,⁵⁹ as well as draft amendments covering the Occupational Qualification Sub-Framework.⁶⁰ An example of a change in the Higher Education standard is the insertion of the requirement: "A person who teaches pharmacy practice must be a pharmacist registered in South Africa". Perhaps of greater relevance to the implementation of NHI, the SAPC also updated the schedule of fees that a pharmacist may charge for professional services.⁶¹ As before, the fees relating to dispensing of finished pharmaceutical products are those published in terms of the Medicines and Related Substances Act of 1965. However, for any additional services, such as extemporaneous compounding, sterile preparations, pharmacokinetic consultations, medicines use reviews, chronic medicines authorisation, or pharmacist-initiated therapy, additional fee-for-service rates are prescribed. It is unclear how many of these fees are actually charged by pharmacists or reimbursed by medical schemes. Further draft amendments to the Good Pharmacy Practice standards were published in May 2019.⁶² Also issued in May 2019 were the final regulations governing continuing professional development for those registered with the SAPC.⁶³

Jurisprudence

The most pressing court decision in the past year has undoubtedly been the Constitutional Court judgment in the cannabis cases referred from the Cape High Court.⁶⁴ This judgment poses an existential challenge to the logic underpinning the regulation of so-called "drugs of abuse". That logic rests on the assumption that some substances with psychoactive properties can be deemed to have legitimate medicinal uses (and therefore regulated in terms of the Medicines and Related Substances Act of 1965), whereas others can be designated as having no legitimate

medicinal applications, allowing their possession and use to be proscribed (in terms of the Drugs and Drug Trafficking Act of 1992). In addition to the criminal sanctions applied, there are additional measures prescribed in terms of the Prevention of and Treatment for Substance Abuse Act of 2008.

In essence the Constitutional Court confirmed the ruling of the Cape High Court, finding the restrictions on the possession, cultivation and use of cannabis by an adult, in private, to be inconsistent with the right to privacy entrenched in section 14 of the Constitution. The court therefore found the definition of “deal in” in section 1 and section 4(b) of the Drugs and Drug Trafficking Act of 1992, and section 22A(9)(a)(i) of the Medicines and Related Substances Act of 1965, to be constitutionally invalid. The declaration of invalidity was, however, suspended for a period of 24 months from the date of the handing down of the judgment (18 September 2018), but with specific wording “read in” to the sections listed in the interim.

South Africa is a signatory to the United Nations Single Convention on Narcotic Drugs of 1961, which requires the country to take certain legislative steps to control the possession, use and trade in substances listed in the various Schedules to the Convention. Although amendments to the Schedules in relation to cannabis and cannabinoids were proposed by the World Health Organization Expert Committee on Drug Dependence (ECDD) to the Commission on Narcotic Drugs in March 2019,⁶⁵ and supported by the South African delegation, it appears that a decision to implement them was postponed to later in the year.

The Department of Justice is in the process of drafting a new Cannabis Regulation Bill, but no details are publicly accessible yet. The necessary amendments to the Medicines and Related Substances Act of 1965, have yet to be drafted. However, there is an ongoing process of updating the Schedules to that Act, and also of issuing licences for the cultivation of cannabis for medicinal purposes.⁶⁶ One consequence is that the Constitutional Court judgment has introduced considerable uncertainty, and resulted in a marked increase in the number of under-regulated cannabis-containing products reaching the market, including those that make medicinal claims that might not be justified or safe.⁶⁷ Despite the judgment, the marketing of cannabis-based medicinal products is still subject to the requirements of the Medicines Act.⁶⁸ In May 2019, specified cannabidiol-containing medicinal preparations were exempted from the operation of Schedule 4 to the Medicines Act.⁶⁹

The broader question of how South Africa will approach the question of non-medicinal use of drugs remains unresolved and awaits the update to the National Drug Master Plan (NDMP). The Cabinet statement of 27 March 2019 noted that the evaluation report on the National Drug Master Plan

2013 - 2018 had been approved, and that “the setting up of an Anti-Drug Council, structured similarly to the South African National AIDS Council, to drive the fight against drug addiction” was approved.⁷⁰ The Cabinet noted that the “revised master plan will now be referred to as [the] Anti-Drug Master Plan”, an unfortunate echo of the discredited “war on drugs” rhetoric.

In August 2019, the Supreme Court of Appeal dismissed an appeal against a previous High Court judgment which found that a mother had failed to prove that the damage sustained by her child (due to hypoxaemia during childbirth) was due to the negligent failure of the hospital staff involved in the child’s delivery.⁷¹ Nonetheless, the court expressed its displeasure with the quality of care delivered in the province in question: “Far too often this court is confronted with serious and serial negligence in hospitals falling under the respondent. Whether or not the negligence can be said to have caused harm in the delictual sense, it is clear that studied neglect of standards has become pervasive in many such hospitals” (para. 28).

A recent decision in the Western Cape Division of the High Court⁷² could have far-reaching implications for the way in which amendments are made to schedules to an Act of Parliament, such as the schedules to the Medicines Act. In opposing an application for his extradition to the United Kingdom, where he was suspected of having committed certain criminal offences relating to the production, cultivation, possession, and supply of cannabis, the person concerned challenged, among others, the constitutionality of section 63 of the the Drugs and Drug Trafficking Act (140 of 1992) (Drugs Act). This provision empowers the Minister of Justice and Correctional Services to amend the schedules to the Drugs Act. This authority was challenged as an impermissible delegation of power and a breach of the separation of powers doctrine, on the basis that Minister’s power encroached on the function of parliament to promulgate primary legislation, which, it was argued, included the schedules to the Drugs Act. A single judge bench found that the section was indeed unconstitutional, and ruled that all amendments made pursuant to the passing of the Drugs Act stood to be impugned. However, as the scheduling of cannabis was done concurrently with the promulgation of the Drugs Act, its scheduling was not affected with regard to this case.

Section 37A of the Medicines Act contains a similar provision: “Amendment of Schedules – Notwithstanding the provisions of section 35(2), the Minister may, on the recommendation of the Authority, from time to time by notice in the Gazette amend any Schedule prescribed under section 22A(2) by the inclusion therein or deletion therefrom of any medicine or other substance, or in any other manner”. As amendments to the schedules to the Medicines Act are much more frequent, striking down such a provision could lead to the absurd result of having

to resort to parliament every time an item is added to, or deleted from, the schedule. On the other hand, an important principle of our constitutional democracy has been raised, namely whether a schedule that may be considered an integral part of legislation may be amended without resort to parliament. Ultimately, the Constitutional Court will be required to pronounce on the constitutionality of section 63 of the Drugs Act (and indeed all other similar provisions) and provide directions on the remedy to a possible legal impasse.

Conclusions

South Africa has been poised on the brink of fundamental reform of its health system for a number of years. Many of the principles underpinning the attempt to create a unified health system for the country have remained unchanged since the first health-related White Paper in 1997. That they have proven so difficult to implement is testament not only to the scale of the challenge, but also to the consequences of the quasi-federal Constitutional order confirmed in 1996, and in particular the impact of fiscal federalism. Following the tabling of the NHI Bill, and the recommendations of the almost five-year Health Market Inquiry, it is critical that these processes be aligned, especially in terms of the phased changes envisaged by both sets of proposals. Whether these reforms will see re-invigorated public participation in the planning and provision of healthcare services is also open to question, but such participation is equally crucial to a meaningful application of Comprehensive Primary Health Care, a critical pillar of our healthcare system. The Presidential Health Summit cannot merely be an event, but must signal a new approach to meaningful engagement with all stakeholders.

The radically transforming terrain of health services demands a high degree of policy coherence, as well as visionary stewardship from government in a participatory and inclusive national effort.

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How can we best achieve a universal health system:

a public conversation

Author

Diane McIntyre¹

The NHI Bill can and must be improved. Greater and faster progress in addressing the serious efficiency and equity challenges facing the South African health system can only happen if the public conversation focuses on how best to achieve a Universal Health System.

The recently released National Health Insurance (NHI) Bill has once again led to heated debate about health system reform. Some media coverage of the Bill demonstrates lack of clarity on the nature of these reforms. However, much of the controversy is attributable to different levels of 'buy-in' to the goal of NHI, which is to move towards a universal health system (UHS). South Africa is not alone in pursuing this goal; it is a key element of the health-related Sustainable Development Goals. Underlying the goal of UHS are the principles of: universality (i.e. everyone benefits, not just a privileged few); and social solidarity whereby there are both income and risk cross-subsidies in the overall health system. UHS is fundamentally a redistributive policy and as such it is not surprising that it has generated intense debate.

This chapter explains what the key elements of NHI reform are and unpacks how these elements will contribute to achieving a UHS. It also considers some of the key concerns raised in debates around the Bill, particularly the pace of change; affordability and sustainability of the reforms; and governance issues.

The NHI Bill can and must be improved. It is 25 years since the first democratic elections, and there must be greater and faster progress in addressing the serious efficiency and equity challenges facing the South African health system. This can only happen if the public conversation focuses on how best to achieve a UHS, backed with clear explanations of how any proposed reforms will achieve this goal.

Introduction

Release of the National Health Insurance (NHI) Bill¹ has generated intense debate and considerable negative media coverage. This is partly related to concerns about embarking on major structural reforms, particularly in the current weak macro-economic and fiscal environment and within the context of poor governance. In many cases, criticism is based on lack of understanding of what is being proposed. Many criticise the Bill for providing insufficient detail on the proposed reforms. However, it is not appropriate to provide intricate detail in legislation. While more detail is included in the Green² and White Papers^{3,4} that preceded the Bill, some areas remain unclear.

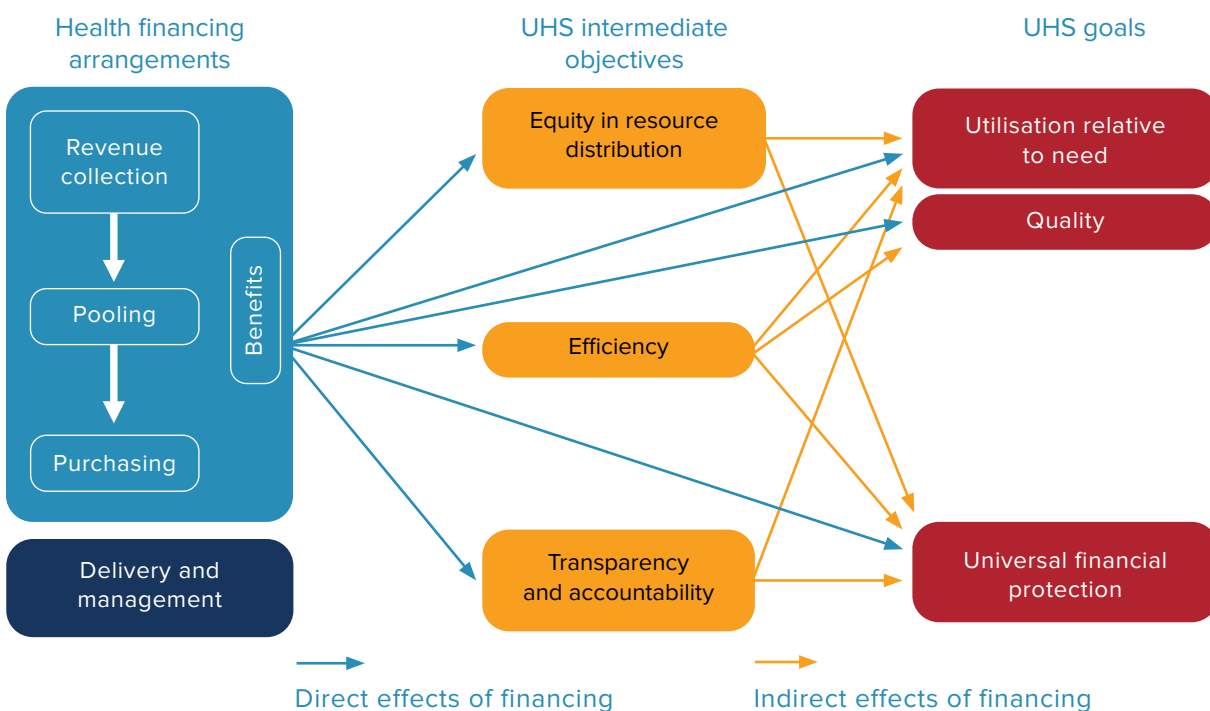
The purpose of this chapter is to provide information on the ‘what’ and ‘how’ of the proposed NHI. Due to space constraints, it is not possible to explore the ‘why’ of the reforms, which relate to current health system challenges in South Africa. These have been documented elsewhere in this *Review*,^{5,6} including in other chapters of this edition of the *SAHR*. It is well recognised that there are challenges in both the public and private health sectors and in the maldistribution of resources between the public and private health sectors relative to the population each serves. There is growing recognition that the NHI proposals are about moving to universal health coverage (UHC), which is a key element in the health-related Sustainable Development Goals (SDGs).⁷ Substantial progress towards a universal health system (UHS) cannot be achieved by ‘fiddling

around the edges’ of a status quo system. Instead, fundamental system-wide changes are required.

The term ‘NHI’ may have contributed to the confusion around the proposed reforms, as the word ‘insurance’ leads many to assume that NHI is about creating a large medical scheme. Although the term ‘UHC’ is widely used internationally, it also has its drawbacks, particularly as the term ‘coverage’ once again creates the impression that the emphasis should be on population coverage by an insurance scheme. This is illustrated in the initial selection of insurance coverage as an indicator of UHC in the SDGs.⁸ As noted by Kutzin, “UHC is a set of objectives that health systems pursue; it is not a scheme”. According to him the focus should be on the “population and system as a whole”.⁹ It may be preferable to use the term Universal Health System (UHS) rather than NHI or UHC as it is more descriptive of the nature of the reform and less open to misinterpretation, while adopting the same internationally accepted UHC goals and objectives.

This chapter reflects the author’s personal understanding of the proposals, based on involvement in some of the health financing policy processes and extensive research into efforts to progress toward a UHS in other countries, particularly middle- and high-income countries.

Figure 1: Intermediate objectives and final goals of a universal health system (UHS) influenced by health financing



Source: Adapted from Kutzin, 2013.⁹

Conceptual framework

The proposed reforms are largely, but not exclusively, related to reform of healthcare financing arrangements. Figure 1 presents an overview of the internationally accepted goals of a UHS, which are to enable everyone in a country to access and use the health services they need; these services should be of sufficiently high quality to be effective, and no one should face financial hardship through using these services. The figure also shows that health-financing arrangements are not only about how to generate funds for the health sector (the revenue collection function), but also about how these funds are pooled and how they are used to ensure that there are accessible, quality health services through active or strategic purchasing. Finally, the figure shows that the health-financing arrangements within a country can contribute directly to achieving UHS goals and contribute indirectly through influencing the UHS intermediate objectives of equity in resource distribution, efficiency, and transparency and accountability.

Before outlining the key proposed changes in health-financing arrangements in South Africa and considering how they are expected to contribute to UHS objectives and goals, it is important to recognise explicitly that UHS is fundamentally redistributive. Universality and social solidarity are core principles of a UHS. Social solidarity implies income and risk cross-subsidies within the overall health system, with individuals contributing towards health service funding based on their ability to pay but benefiting according to their need for health services. This is effectively a net transfer of financial resources for health care within a funding pool between groups with different socio-economic status and different health-risk profiles. As there is a strong relationship between low socio-economic status and a greater need for health care, and substantial income inequalities in South Africa, the net transfer required can be represented as in Figure 2.

What are the NHI reforms about?

Figure 3 provides a visual overview of the main health-financing changes envisaged in the NHI Bill, organised in relation to the three key functions of healthcare financing, namely revenue collection, pooling, and purchasing. The figure also indicates key changes required in service delivery and management.

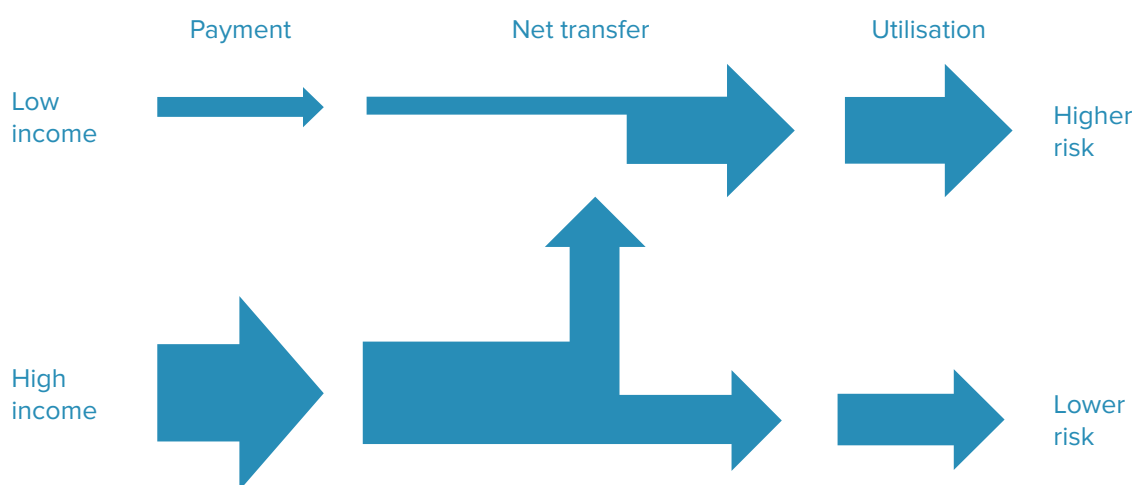
Revenue collection

Revenue collection changes relate mainly to gradually increasing the allocation of tax funding to the health sector, including ultimately increasing tax rates or introducing new 'NHI-related' taxes. This would be in line with international evidence that mandatory pre-payment financing is critical for a UHS. It would not simply represent an absolute increase in tax funding, but more importantly, a change in the relative share of tax funding in overall health financing, as contributions to medical schemes are likely to decline over time. There would also be a decline in out-of-pocket (OOP) payments for health services, both through removing user fees at public sector hospitals and through a relative shift away from voluntary private health insurance (medical schemes) and the associated co-payments and restrictions on benefit packages.

Pooling

The NHI Bill proposes a change in pooling arrangements through the introduction of a single pool of tax funds, allocated to the NHI Fund (NHIF), for health services to benefit the entire population. It is proposed that once the reforms are fully implemented, medical schemes will only provide 'complementary cover', i.e. will cover services not funded under the UHS (e.g. elective caesarean section deliveries). The overall intention is to reduce fragmentation in funding pools to maximise income and risk cross-subsidies.

Figure 2: Illustration of income and risk cross-subsidies in a universal health system



Source: Adapted from WHO, 2000.¹⁰

Purchasing

Probably the most important aspect of the proposed changes relates to purchasing, particularly the creation of an autonomous institution (the NHIF) to strategically purchase health services for the whole population. Key characteristics of strategic purchasing (as opposed to passive purchasing) include:

- Specifying service benefits – this does not require an exhaustive itemised list of services covered, but it is likely to include detailed specification of the type and range of services to be provided at different facilities, the use of standard treatment guidelines (STGs), and primary care gatekeeping with a requirement to follow referral pathways.
- Having formal service-level agreements or contracts that indicate explicitly to providers the range, quantity and quality of services they are expected to deliver.
- Allocating funds and paying providers using mechanisms that provide appropriate signals

and incentives for quality, efficiency and equity in service provision.

- Actively monitoring quality and other aspects of service provision.

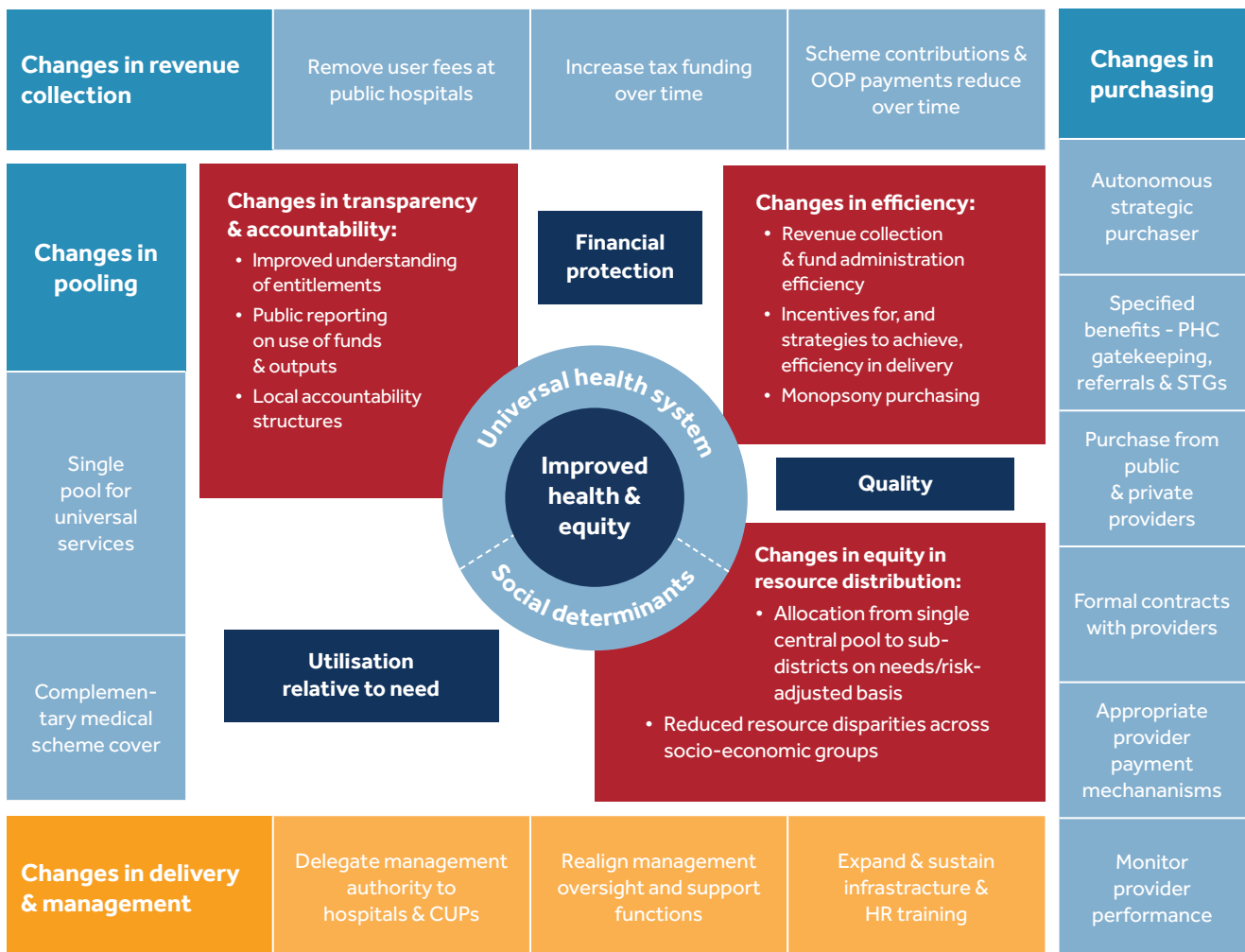
Given the sectoral distribution of health professionals in South Africa, the NHIF will purchase from both public and private service providers, with the emphasis initially on the primary health care (PHC) level, given that most health service needs can be addressed at this level.

Service delivery and management

In addition to these financing changes, several changes are required in service delivery and management.

Most importantly, operational management of service delivery must be delegated to individual hospitals and geographically defined groupings of PHC providers, called Contracting Units for PHC (CUPs) in the NHI Bill. Such delegation is necessary to enable facility managers to be responsive to strategic purchasing incentives

Figure 3: Overview of proposed health-financing changes in South Africa and their relationship with UHS goals and intermediate objectives



CUP = contracting unit for primary health care; HR = human resources; OOP = out-of-pocket; PHC = primary health care; STG = Standard Treatment Guidelines.

and population needs, and to be held accountable for performance.¹¹ This will in turn require a realignment of service delivery management functions in provincial health departments towards an increased emphasis on oversight and support functions. There will be an ongoing need for National Department of Health (NDoH) involvement in ensuring an adequate supply of health service infrastructure and human resources.

How will the NHI reforms promote UHS?

This section elaborates on the proposed changes outlined in the previous section through exploring how they can contribute to achieving the intermediary objectives and goals of a UHS. Explored in the next section are some of the key concerns raised in the media and public debates, particularly the pace of change; affordability and sustainability; and governance issues.

Promoting efficiency

The proposed changes will promote administrative and service delivery efficiency in the following ways:

- Using the existing tax system will minimise revenue collection costs.
- International experience demonstrates very low administration costs where a single institution purchases services for the population (e.g. 3.6% of total health expenditure in the South Korean NHI and 1.2% in Thailand's Universal Coverage scheme).^{12,13}
- Moving away from fee-for-service payment of private providers and line-item budgets in the public sector, to provider payment mechanisms such as capitation at the PHC level and diagnosis-related groups (DRGs) or other case-based payments at hospitals, will promote efficiency in service delivery.¹⁴
- Requiring contracted providers to comply with STGs and with formularies or lists of drugs, medical devices and other medical supplies will also contribute to efficient service delivery and improved cost-effectiveness. STGs will cover all interventions, including surgical procedures, in contrast to the current focus in the public health sector on interventions requiring medicine prescription.
- A single, large (monopsony) purchaser will hold considerable power in managing increases in provider payment rates.¹¹
- PHC gatekeeping and clear referral pathways will promote service provision at the lowest cost possible.¹⁴

A potential source of inefficiency could be multiple layers of management and duplication of management responsibilities. This must be avoided by realigning the functions of existing health department structures (national, provincial and district) in line with delegation of service delivery management to hospitals and CUPs

and centralisation of purchasing responsibilities within the NHIF.

Promoting equity in resource distribution

Equity in resource distribution will be promoted by:

- Having a single pool of funding for the whole population, with medical schemes only providing complementary cover; this will greatly reduce disparities in funding available to meet health needs across socio-economic groups.¹⁵
- Allocation of funds for PHC services by the strategic purchaser (NHIF) on a risk-adjusted (i.e. needs-based) capitation basis will promote equity in PHC services across geographical areas.
- Equitable distribution of service providers will be promoted through taking account of providers' location relative to population health needs in that area when contracting providers, and the equitable allocation of financial resources. Expressed differently, if there is an oversupply of providers in a specific area then some providers may not be contracted (called selective contracting), while areas with an undersupply can attract new providers as they will have funds to contract with more providers than are currently located in that area. This must be supported by NDoH actions to ensure an equitable distribution of health facilities and health workers, including regulation of the supply of new private facilities in line with the recommendations of the recent Health Market Inquiry.⁵

Equitable distribution of resources for specialist and inpatient hospital care could be undermined by a case-based payment system, which allocates funds according to use of services rather than need for care. Research has indicated much greater use of hospital services, particularly at the highest referral level, among higher socio-economic groups.¹⁶ While removal of user fees at hospitals will improve access to referral services, the cost of transport to referral facilities will remain an access barrier for poorer groups.¹⁷ Therefore, to promote equity it will be necessary for the UHS to include patient transport to referral facilities as a service benefit, particularly for those living in rural areas.

Promoting transparency and accountability

This is an area where many commentators believe that there are inadequacies in the NHI Bill (see discussion on governance). Nevertheless, certain important UHS design elements will promote transparency and accountability, including:

- Clarity that UHS service users will not be required to make any payment at point of service; this will be a major improvement in transparency about entitlements (i.e. it will prevent informal or 'under-the-counter' payment demands, or balance-billing, by providers).
- Annual reporting by the NHIF to parliament will promote transparency and accountability in the use of resources.
- Delegation of management authority to CUP and hospital level will be accompanied by improved local accountability structures. As delegation is likely to require a change in organisational form for hospitals and CUPs

(e.g. to specialised service delivery units), more effective local accountability structures can be established through associated regulation than exist at present.¹⁸

Achieving UHS goals

The main way in which financial protection will be enhanced is through the removal of user fees at public hospitals and through having no out-of-pocket payments at point of service use. A potential challenge to financial protection relates to services not funded through the UHS. This will depend on how medical schemes structure their complementary cover packages, such as the extent to which co-payments are required, and the affordability of such cover.

Many of the ways in which service utilisation based on need and quality service provision will be promoted are covered above, particularly in terms of equity in resource distribution. Tax funding of the UHS, rather than via health insurance contributions, means that entitlement to use health services is not directly tied to contributions/payments. Having a single pool of funds will maximise income and risk cross-subsidies, which as indicated in Figure 2, is fundamental to service use in line with need. Strategic purchasing is critical to promote quality health services, particularly through making quality expectations clear in contracts with providers, using provider payment mechanisms that incentivise provision of quality health services, and that monitor service quality and act on poor performance.

Is UHS feasible?

The proposed reforms are in line with recommendations from international organisations for moving towards a UHS, based on detailed review of experience worldwide. For example, the World Health Organization (WHO) notes that: “Three broad principles guide health financing reforms to accelerate progress towards universal health coverage. The first is to move towards a predominant reliance on compulsory (i.e. public) funding sources. The second is to reduce fragmentation in pooling to enhance the redistributive capacity of these prepaid funds. The third is to move towards strategic purchasing, which seeks to align

funding and incentives with promised health services.”¹¹ Nevertheless, many media reports question the feasibility of the reforms. In this section, three areas of concern most frequently raised in media reports are briefly considered: the pace of change; affordability and sustainability of the reforms; and governance issues.

Pace of change and phased implementation

There is concern that the NHI Bill implies full implementation by 2026. Reforms of the magnitude envisaged must be phased in gradually and sequenced appropriately, particularly within the current context of serious macro-economic and fiscal challenges. While explicit timelines can be helpful in maintaining momentum and engendering a sense of urgency, they should be linked to detailed implementation plans; however, it is inappropriate to include these plans in legislation such as the NHI Bill. In the absence of an implementation plan in the public domain, suggestions and questions are presented in this section around the phasing and pace of implementation.

A critical first step, which could be implemented alongside piloting key reform elements, is to develop an integrated information system to ensure all data necessary for strategic purchasing are available before wide-scale UHS reforms are implemented.¹¹

While there were some achievements on the NHI Green and White Paper ‘first phase’ and associated ‘NHI pilot district’ initiative, these did not focus on piloting the core components of financing and service management arrangements that are critical for progressing towards a UHS. Therefore, it would be advisable to pilot some of the proposed reforms to ‘learn by doing’ through careful monitoring and evaluation of pilots, particularly in terms of delegation of management authority to hospitals and CUPs along with appropriate governance and accountability mechanisms, and initiating strategic purchasing.

Delegation of management authority to public hospitals must be phased in gradually to develop adequate management capacity within each hospital. Delegating all management responsibilities to individual PHC

Box 1: What are CUPs?

A CUP is envisaged as a grouping of PHC providers within a defined geographical area, including all public clinics and/or community health centres and the ward-based outreach teams (WBOTs) in that area. As first-level referral hospitals are an integral part of comprehensive, integrated PHC services, each CUP should ideally include a district hospital. CUPs can also

include private PHC providers where this will promote access to comprehensive, quality PHC services for all in the area. The concept of a CUP is likely to function best at what is currently the sub-district level; districts are too large to allow truly decentralised and cooperative management. Thailand has successfully used CUPs in its universal system.¹³

facilities such as clinics would result in unsustainably high management costs. It is within this context that the NHI White Paper and Bill have proposed CUPs (Box 1).

The Minister of Health has appointed an expert in public sector change management to design and develop the organisational structure for the NHIF. While it will take time to establish the NHIF as an autonomous entity, it is anticipated that the core capacity for strategic purchasing will begin to be assembled in the near future, possibly as a 'NHIF Office' within the NDoH.

A key question is how to phase in the NHIF's strategic purchasing function. It is evident that Treasury's preference is to contract out services to private providers to plug perceived holes in current service delivery, and to designate almost all 'NHI grant' funding for this purpose. Treasury officials have indicated that priorities in this respect are:

- Contracting private GPs to see patients in their own practices;
- Expanding the Central Chronic Medicines Dispensing and Distribution (CCMDD) programme through private pharmacies;
- Contracting (presumably with private hospitals and specialists) to address backlogs in cataract surgery, cancer care and other high-priority areas; and
- Creating a mixed public and private platform for maternity and obstetric services.

Emphasis on private-sector contracting in use of NHI funding was also pointed to in the recently released Medium Term Budget Policy Statement (MTBPS), which stated that "given the macroeconomic and fiscal outlook, the estimates to roll out NHI that were published in the NHI Green Paper in 2011 and White Paper in 2017 are no longer affordable" and that instead "National Treasury assisted the Department of Health to develop an actuarial model with updated fiscal costs and *limited policy reforms* to strengthen the current healthcare system" (author's emphasis).¹⁹ This implies a change in implementation emphasis from that outlined in the Green and White Papers. The MTBPS also indicates that the NDoH has been required to "reprioritise funds *within its 2019/20 budget* to establish an NHI Office" (author's emphasis).¹⁹ The only reference to *additional* funds for the health sector is that "Provinces will receive a direct grant to *contract* health professionals" (author's emphasis) and that "from 2021/22 new components will be added to the [conditional] grant for mental health and oncology".¹⁹

This approach raises several questions and concerns about how implementation of the reforms will be phased in. While there is no question about the severity of the macro-economic and fiscal constraints faced at present, a key question is whether the way forward is the "limited policy reforms" referred to in the MTBPS, contracting out some services to private providers, or whether it is better to proceed with the trajectory envisaged in the White Paper, but at a far more gradual pace and over a longer

timeframe. One of the concerns about Treasury's preferred approach is that it is somewhat 'piecemeal' and could detract from integrated, comprehensive service provision, creating vertical programmes and entrenching separation of public and private sector provision. A related concern is that the efficiency gains of strategic purchasing are very unlikely to be achieved by contracting out a few services to private providers via direct grants to provinces rather than through building the strategic purchasing capacity of the NHIF.

An important element of the proposed reforms is to be able to draw on the human resources in the private health sector to assist in meeting the needs of the entire population. Given the importance of improving access to quality PHC services (see later section on affordability), the emphasis should be on drawing on private primary care providers such as GPs for services requiring a doctor, pharmacists for dispensing of medicines, and on providing access to dental, optometry, physiotherapy, mental health and other services. While this is to some extent in line with Treasury's priorities, to promote integrated provision of comprehensive PHC services it would be ideal for these providers to be part of the local CUP. In this way, the NHIF would purchase services from the CUP, which would include all relevant public and private providers, with co-operative governance and shared responsibility for ensuring access to quality PHC to the population in that area. This would also enable peer clinical and operational support across providers. It is unclear how contracting out services to GPs and pharmacists as proposed by Treasury would promote an integrated public and private delivery platform.

It is also important to recognise that the public health sector is the largest provider of services at present and will remain the backbone of the future service delivery system. Public sector services are under severe financial pressure, most evident in the many frozen posts in public health facilities. In addition, there has been limited implementation of the WBOTs in some areas due to funding constraints.²⁰ In this context, it may be prudent to prioritise purchasing from public providers, and at payment rates that ensure adequate resourcing to achieve the MTBPS's vision of "strengthening the current healthcare system".

As the NHIF's primary role would be to purchase comprehensive services for the entire population, it would surely be preferable to pilot its strategic purchasing function through purchasing comprehensive services from the outset, such as from the pilot delegated management hospitals and newly established CUPs. One of the priority uses of NHI allocations from Treasury should be to establish a well-capacitated NHIF Office and ensure that services purchased from pilot hospitals and CUPs (which could include private PHC providers) are adequately funded. NHIF staffing can be expanded over time as the number of contracted providers increases.

As the macro-economic and fiscal context gradually improves, more CUPs can be established and management authority delegated to more public hospitals, with simultaneous expansion of the NHIF's role in strategically purchasing from each of these hospitals and CUPs. The pace of expansion would be influenced by funding availability.

Once the NHIF is purchasing health services in all geographical areas and for the entire population, medical schemes will be expected to transition to provision of complementary cover. For this to happen, there must be confidence in the UHS, particularly that quality health services are accessible to all when needed. This can be achieved by piloting major reforms; gradual expansion of these reforms along with improved resourcing for public providers; and drawing on private providers to ensure accessible comprehensive services. Given the apparent divergence of perspectives on what reforms should be prioritised for implementation, there is an urgent need for open engagement on how best to sequence and phase in reforms to move towards a UHS efficiently and equitably.

Affordability and sustainability of a UHS

A frequent claim in media reports is that a UHS will be unaffordable. This is largely based on a fundamental misunderstanding of the nature of the proposed reforms, particularly the misconception that medical scheme coverage will be expanded to all South Africans. Given that over R200 billion is spent currently on less than 16% of the population who are currently medical scheme beneficiaries, this would indeed be an unaffordable reform pathway. Even if some 'savings' could be achieved through making medical scheme membership mandatory for everyone, it is simply not feasible to spend over a trillion Rand on health care in South Africa.

The Competition Commission's Health Market Inquiry highlights a range of factors contributing to affordability problems in the 'medical scheme and current private provision model'.⁵ To ensure affordability of a UHS, it is essential to explicitly move away from this model, which focuses on curative care; allows direct access to specialists even though most health services could be provided by PHC providers; pays providers on a fee-for-service basis; and is plagued by uncontained increases in provider fees and supplier-induced demand related to over-supply.⁵

International experience, particularly in middle-income countries, indicates that an affordable and sustainable UHS is feasible if the following approach is adopted:

- There must be a strong focus on preventive and promotive services, with Community Health Workers (CHWs) being a key element in the PHC team in this regard.¹³ This is particularly important in limiting the increasing incidence of non-communicable diseases in South Africa, as this could pose a long-term sustainability challenge to a UHS.
- There will also need to be a strong focus on primary

care services, with strict PHC gatekeeping and adherence to referral pathways. This is essential to ensure that health services are accessed at the appropriate and lowest cost level at which effective interventions can be provided.¹⁴ Further, within PHC facilities, services should be provided by the least skilled health worker capable of providing that service.

- An extensive set of STGs covering the full range of health interventions, medicine formularies or essential drug lists (EDLs) and medical device lists must be developed. Public and private providers contracted by the NHIF must be required to comply with these STGs and lists. This will ensure that the most cost-effective interventions are delivered. New technologies should only be made available after cost-effectiveness and budget-impact assessments have been done.
- The change in provider payment mechanisms outlined in an earlier section will contain costs more effectively than the predominantly fee-for-service payment system currently used in the private sector.
- As a single/monopsony purchaser, the NHIF will have strong negotiating power in establishing and maintaining affordable provider payment rates.
- Selective contracting in geographical areas with an over-supply will limit the potential for supplier-induced demand.

There are also frequent demands to know exactly how much a UHS will cost. It will cost what we can afford in terms of how much funding is available as there will be a global budget cap on the NHIF.¹⁴ The NHIF will be funded through annual allocations from Treasury, and the NHIF as a strategic purchaser will have to operate within the constraints of that pool of funds. This funding limit will influence the pace of transition to a UHS and will ensure its affordability and long-term sustainability. It is critical to recognise that the UHS reforms do not imply 'writing a blank cheque'. The emphasis in costing should be on obtaining accurate cost data for each new phase of roll-out to allow careful budget impact analysis before implementation.

An issue that requires clarification in the NHI Bill is how the activities of the Benefits Advisory Committee (BAC) and the Health Care Benefits Pricing Committee (HCBPC) will intersect, and the involvement of the NHIF in these committees. If they operate in isolation from each other and from the NHIF, this is likely to create unfunded mandates and make the UHS unaffordable and unsustainable. Indeed, the role of the HCBPC requires clarification as it could undermine the NHIF in exercising its purchasing power.

A final issue in relation to affordability is the concern that increased tax funding for the UHS will unduly burden personal income taxpayers. At present, many personal income taxpayers belong to medical schemes and are faced with contributions that account for a relatively high percentage of their income^{a,21} and that have increased annually at rates far exceeding inflation for several decades. As the UHS is rolled out and medical schemes move to

a The most recent estimates are that medical scheme contributions range from 15.8% of income before tax credits (and 9.2% after tax credits) for the lowest income medical scheme members to 5.5% before and 4.7% after tax credits for the highest income scheme members. This also indicates that scheme contributions are regressive across scheme members from different socio-economic groups.

providing complementary cover (Box 2), increased personal income tax payments for the UHS will be less than current medical scheme contributions for the majority of current scheme members.

Governance issues

There is an understandable lack of trust in government and legitimate governance concerns given the last decade of extensive misuse of public funds and weak governance. But this should not prevent efforts to make substantial progress towards fulfilling the Constitutional commitment that “everyone has the right to have access to health care services”.²²

Instead, the focus should be on how to ensure good governance. There will hopefully be many submissions to the Parliamentary Portfolio Committee on Health with valuable suggestions on how the process of appointing the NHIF CEO, and appointments to NHIF governance bodies and related committees, can be done in a transparent and accountable way. Similarly, there are likely to be many submissions on how proposed governance structures can

be broadened to ensure the inclusion of a range of health sector actors, particularly civil society groups that have played a critical role in exposing corruption and insisting on accountability. However, international experience has found that having representation of specific interest groups has made oversight and governance structures “incapable of making hard choices or serving as an adequate and timely forum for decision-making”. International experience also indicates that rather than securing the interests of specific economic groups, representation should incorporate a range of social actors, increase transparency, and involve technical experts.²³ The emphasis should be on individuals whose interest is serving the public good. Internationally, there is growing emphasis on governance “being grounded in citizen/population representation”.¹¹

Transparency and accountability can also be promoted through annual public reports that are accessible to the public. The reports should not only indicate how public funds have been used but also the NHIF’s performance in expanding access to quality health services in line with the

Box 2: Role of medical schemes/private health insurance in a universal health system in South Africa

There has also been debate about the most appropriate future role for private health insurance (PHI), i.e. medical schemes in South Africa. At present, PHI in this country is completely out of line with the rest of the world. The WHO’s Global Health Expenditure Database^a indicates that PHI as a share of total current spending on health is higher in South Africa (47%) than in any other country in the world. Globally, the share of total health spending on PHI averages at a mere 4% and it accounts for more than 20% of health spending in only six countries and for more than 10% in only 25 countries. The PHI share of financial resources for health in South Africa is particularly disproportionate given that less than 16% of the population benefit from these resources.

This not only creates substantial disparities in financial resources for health across socio-economic groups but also impacts on the functioning of the overall health system. For example, it promotes a maldistribution of health professionals, with far higher health professional to population ratios for those covered by PHI than for those who are not members of PHI, drawing healthcare resources away from those who need them most. International experience¹⁵ highlights other challenges where PHI does not focus on complementary cover,

such as: higher incomes for health professionals serving PHI members, which creates constant upward pressure on overall health expenditure; preferential treatment for PHI members (e.g. going to the head of the queue, receiving longer consultations, etc.); and wastage of capacity and resources trying (generally unsuccessfully) to regulate PHI and providers effectively. It also fragments risk in the overall health system, which is difficult and costly to address successfully via risk-equalisation or risk-adjustment mechanisms.

As indicated earlier, the medical scheme model is not an affordable basis for a UHS in South Africa and it is, therefore, not an option to make scheme membership mandatory. Complementary PHI would ‘right-size’ the relative share of total health expenditure on PHI, bringing South Africa in line with the international norm. It also avoids the adverse impacts on the overall health system outlined above; it is in line with the fundamental principle of UHS, namely social solidarity and maximal income and risk cross-subsidies; and it is more effective in promoting efficiency, affordability and equity in the overall health system.

a <https://apps.who.int/nha/database>

healthcare needs of the population. While it is inappropriate to specify the indicators and other information to include in such reports within the NHI Bill, these details should be specified in regulations.

Finally, governance and accountability structures should not only be seen to be important at the level of the NHIF, but also at the service-delivery and management levels. The delegation of management authority to individual hospitals and CUPs must be accompanied by appropriate mechanisms to promote good governance and accountability to local communities. If managers of hospitals and CUPs are to meet the priority health needs of their communities through provision of quality services, then inputs from the community are required.

Conclusion

Some stakeholders criticise the NHI Bill for not reflecting or taking account of their inputs on the Green and White Papers, which were the forerunners to the Bill. In reviewing submissions on these Papers, policy-makers will have had to assess carefully whether each input was in line with the ultimate goal of the reforms, namely to move to a UHS. If aspects of the NHI policy were opposed or criticised, but either no alternative was suggested, or the alternative suggested would detract from progressing towards a UHS, it is unclear how these inputs could have been accommodated.

It must be recognised that many of the criticisms of the proposed reforms are coming from the perspective of seeking to protect vested interests or a privileged position and are generally at odds with the principle of social solidarity that underpins a UHS.

The health system status quo is not acceptable; 25 years since our first democratic elections, very little has changed for the worst-off in our society. Indeed, inequalities in income and across many sectors have increased. Taking explicit policy steps to move toward a UHS will not only improve access to quality health care for all but will contribute to the redistributive agenda of the country.

There are undoubtedly ways in which the NHI Bill can and must be improved. However, the policy approach explained in this chapter is fundamentally in line with international experience on how to progress to a UHS as speedily as possible. Instead of trying to prevent progress to a UHS, if those criticising the NHI Bill truly believe that the underlying policy approach is incorrect, the onus is on them to provide detailed proposals for systemic change and demonstrate how it will achieve a truly UHS. The focus of the public conversation should be firmly placed on how best to achieve a UHS.

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National Health Insurance:

vision, challenges, and potential solutions

Authors

Mark S. Blecherⁱ
Jonatan Davénⁱⁱ
Stephen Harrisonⁱⁱⁱ
Wendy Fanoëⁱ
Tafara Ngwaru^{iv}
Thulani Matsebula^v
Nikhil Khanna^{vi}

NHI has the potential to fundamentally transform the South African health sector to a more integrated, equitable and cost-effective system. While the end goals of NHI are laid out in the White Paper, the immediate practical steps to move in this direction need to be articulated more clearly.

National Health Insurance (NHI) is a reform aimed to move South Africa towards universal health coverage, and to bridge the current two-tiered health system in which the public and private sectors operate largely in silos. While some progress has been made over the past decade, with the NHI Green Paper and White Paper envisaging a phased implementation approach, progress has arguably been considerably slower than anticipated. This chapter provides a technical review of the NHI vision, progress and key challenges, and proposes solutions to overcome these challenges in the hope of assisting the South African Government to unblock bottlenecks impeding NHI implementation.

The chapter identifies several important challenges and potential solutions in the areas of revenue raising, pooling,

purchasing and provision, which are critical to a health financing system. Key identified challenges include but are not limited to: difficulties in centralising funding in a national NHI Fund given the existing provincialised health financing system; insufficient progress in building capacity to manage NHI; distrust of the private health sector and slow progress in building a mixed delivery platform, such as capitation arrangements with independent general practitioners; and weaknesses in public sector provision and quality.

The chapter recommends potential solutions to these challenges, including practical steps that can be taken in the medium term to accelerate progress towards the long-term vision of NHI.

i South African National Treasury
ii Health Economics and Epidemiology Research Office, University of the Witwatersrand, Johannesburg
iii Independent legal practitioner
iv Oxford Policy Management
v World Bank Group
vi Clinton Health Access Initiative

Introduction

National Health Insurance (NHI) is a highly anticipated reform and is likely to be the most significant reorganisation of the South African health system ever undertaken. The reform as outlined in the NHI White Paper of 2017¹ aims to move South Africa towards Universal Health Coverage (UHC), meaning that all people and communities have equitable access to the quality health services they need, without exposing users to financial hardship.² At its core, the reform aims to bridge the current two-tiered health system, in which the vast majority of citizens rely on a public health system plagued by lack of access and quality of care, and a predominantly affluent minority access health care in a better-resourced private sector. The Government seeks to achieve this reform by introducing a purchaser-provider split and establishing an NHI Fund as a single public purchaser, which will purchase health services on behalf of the Government for the entire population from a mixed provision platform that will include both public and private providers.

The NHI Green Paper³ and subsequent White Paper envisage a phased implementation of NHI over a 15-year period. The first phase, from 2012 to 2016, mostly entailed piloting and health-system-strengthening initiatives, while the second and current phase from 2017 to 2022 will lay the legal and institutional foundation for NHI, including establishing the NHI Fund, contracting units for primary care (CUPs), and several ministerial advisory committees. The

NHI Bill⁴ was published in July 2019, a key step towards creating the legal framework of NHI. However, while some advances have been made, the reform has arguably been slow to progress after almost a decade of policy making and more than six years of piloting. Few of the activities envisaged in the White Paper for implementation in phase two have taken off substantially.

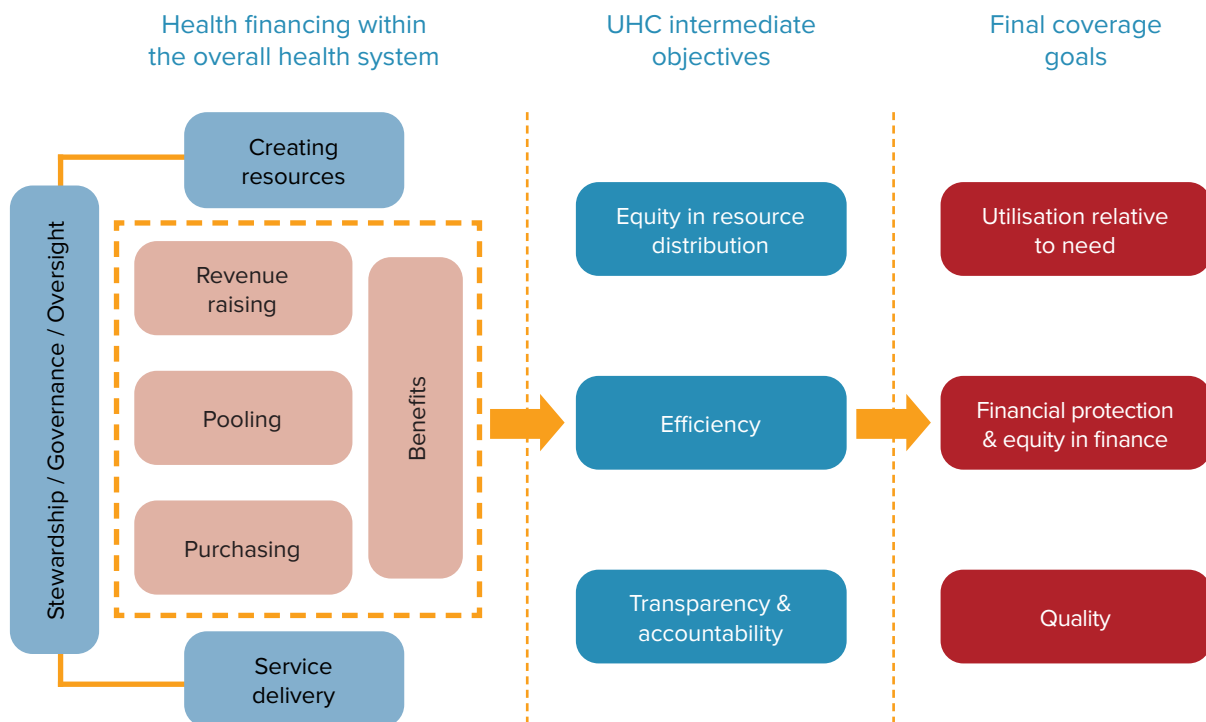
This chapter aims to provide a technical review of the NHI vision and key challenges to achieving this vision, and proposes solutions to overcome these. The review covers key dimensions of health financing, including revenue raising, pooling, purchasing and provision, and includes challenges and potential solutions for financial, policy, legislative and political issues. The hope is that this analysis will assist the South African Government to unblock bottlenecks and take practical steps to make progress with the phased implementation of NHI.

Analytical framework

The World Health Organization (WHO) identifies three key dimensions of health financing within health systems, namely revenue raising, pooling, and purchasing, which are intrinsically linked to the other three core health-system functions, namely provision/service delivery, stewardship/governance, and creating resources⁵ (Figure 1).

In this chapter, the three health-financing functions and provision were used to form the analytical framework. These are generally defined as follows:

Figure 1 : Health financing systems and UHC objectives and goals, WHO, 2017



Source: Kutzin et al, 2017⁵
 UHC = universal health coverage; WHO = World Health Organization.

- **Revenue raising** means the process of raising funds for the health system; this includes sourcing of funds and the mechanisms by which revenue may be raised. Reliability and sustainability of the revenue sources are critical.
- **Pooling** refers to the accumulation and management of revenue so that members of the pool share collective health risks, thereby protecting individual pool members from large, unpredictable health expenditures. Bigger and diverse pools provide better risk adjustment.
- **Purchasing** refers to processes by which funds are transferred from the purchasing authority to healthcare providers, including the management and contractual arrangements that guide these processes. Purchasing can be either active or passive and has implications for efficiency and targeting of health expenditure. Strategic purchasing is essential to ensure value for money.
- **Provision** refers to the arrangements for delivering health services through a platform that can include various types of healthcare providers, both public and private, who are reimbursed by the purchasing authority or authorities. Quality of services and responsiveness towards people's expectations are vital.

Vision, challenges and potential solutions are presented and discussed for each of the dimensions. The vision for each dimension draws primarily on the NHI White Paper, and where relevant, other publicly available policy documents and guidelines. Challenges to realising the vision were identified by the authors drawing on their knowledge and experience as senior managers and experts from government and international organisations. Finally, potential solutions to these challenges were identified to assist the country in progressing towards the vision of NHI. This approach may include a degree of subjectivity and other authors will undoubtedly have prioritised other aspects, such as the political economy of these reforms. The chapter was largely written and submitted before the publication of the NHI Bill in July 2019 and may therefore not fully reflect some of the latest developments.

Key findings

Revenue raising



Vision

The NHI White Paper envisages a significant increase in public financing of health care, both in absolute terms and as a percentage of total healthcare financing. It was projected that public health financing would increase from around 4% of gross domestic product (GDP) to 6.2% of GDP by 2025/26. Although this will require additional funding, total health expenditure may not grow to the same extent as a result of beneficiaries voluntarily leaving medical schemes and instead using publicly funded services as the NHI matures.

It is, however, difficult to predict how much healthcare spending will decrease in the private sector over the same period if the medical aids are losing members. The increased obligation on the public sector must be financed through general taxation. At some point tax revenue for health services must rise. Specific tax mechanisms could be introduced in later stages to finance the impact of this transition to NHI, most likely some combination of payroll tax, surcharge on taxable income, and/or value-added tax (VAT). It is also envisaged that user fees will be abolished under NHI.¹



Challenge: constrained fiscal climate and competing budget priorities

South Africa is in a period of low economic growth, exceeding 1% in only one of the past four years. In the first few years following the global financial crisis of 2008, Government ran large deficits and accumulated large debts, which led to the decision in 2012 to close the fiscal gap (Figure 2). Government expenditure growth has since been contained, and tax increases (both VAT and personal income tax) have already been necessary to address the fiscal deficit.⁶⁻⁸ Nevertheless, national debt (R2.7 trillion in 2019/20) is still rising, with interest payments (R202 billion in 2019/20) being one of the fastest-growing expenditure areas, approaching the level of the entire public health budget. The fiscal deficit is 4.7% of GDP in 2019/20 and exceeds 4% throughout the medium-term expenditure framework (MTEF).

Health's share of the national budget in 2019/20 is 14% of consolidated public spending excluding interest payments.⁶ South Africa's level of public health spending, per capita and as a percentage of government's overall spending, is comparable to that of other upper middle-income countries⁹ but the system is inefficient and better outcomes can be achieved even within these levels. At the same time, several major spending pressures have arisen, such as increasing public sector salaries, fee-free higher education and, more recently, financial support to the national power utility Eskom.⁶ This has limited the possibility of increased funding to the health sector, and given the current economic outlook, these factors are likely to influence health budgets for the foreseeable future.

The White Paper estimates a funding shortfall of R72 billion for NHI by 2025/26, based on an assumption of 3.5% annual economic growth.¹ This model was based on significant increases in utilisation and unit costs of public sector services and a significant degree of private sector provider contracting at discounted private sector prices. Noting that government budgets until 2021/22 are already published and that national growth is significantly below 3.5%, it seems unlikely that the gap identified in the White Paper can be achieved by 2025/26.

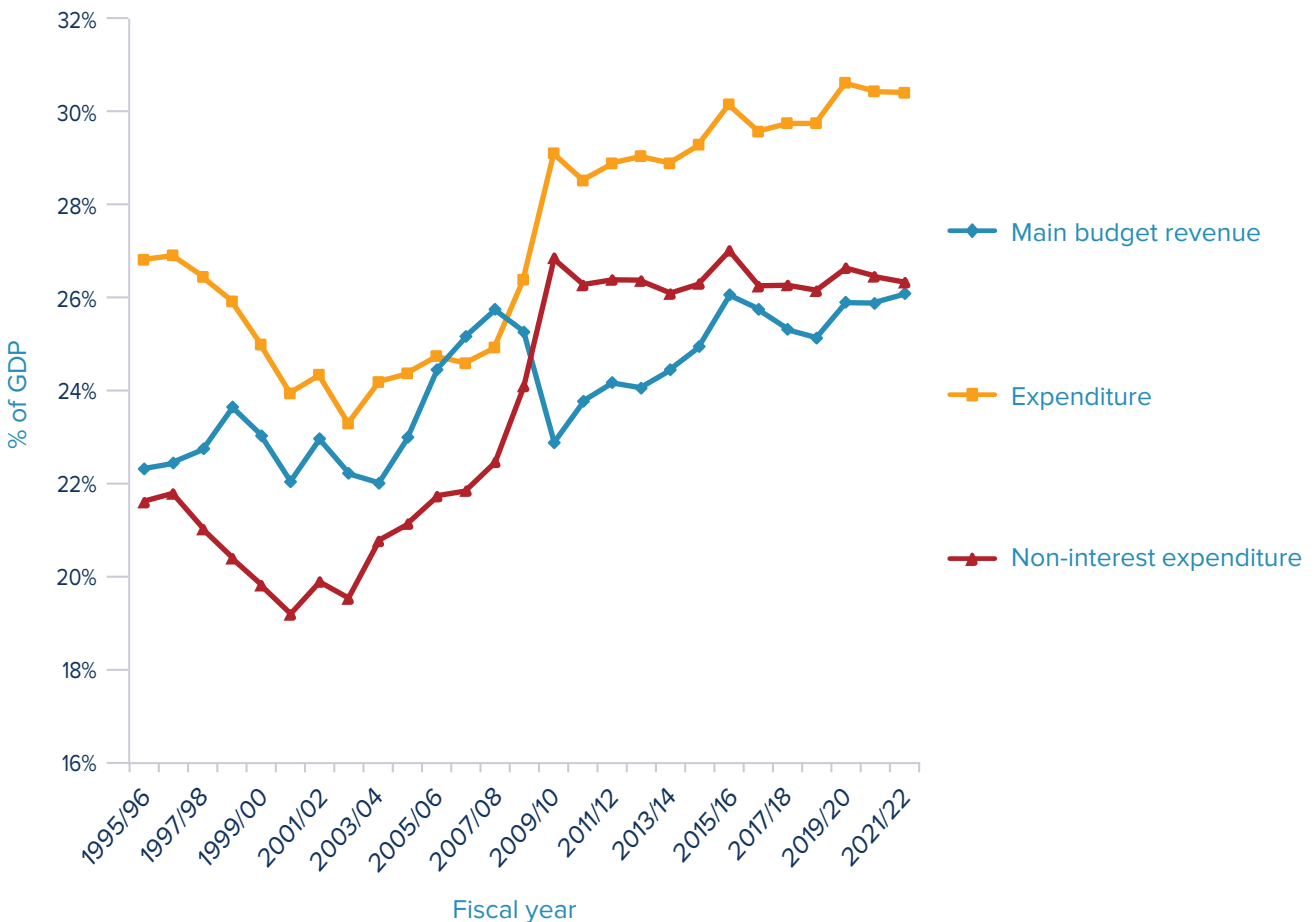


Potential solutions

The authors commissioned and reviewed several updated cost models on NHI. Several tentative conclusions were drawn:

- We see the direction of travel as more important than the duration, and we do not view economic challenges as the main binding constraint in making progress on NHI because full rollout of NHI can be done over a longer timeframe than initially envisaged. The timetable for the funding increases up to 2025 presented in the White Paper are likely not affordable and may therefore need to be extended.
- Some existing costing models for NHI may overestimate the required financial resources because they assume that a high proportion of NHI beneficiaries will use private providers at existing high prices. NHI should rather be conceptualised as gradually and progressively extending patient choices, with attention to building economies of scale, quality and competition. A revised cost model for NHI shows that substantial reforms, including expansion of some services are possible within an additional cost of around R33 billion per annum by 2025/26, with potential further progress over time as more funds become available.⁴ The revised model includes 10 - 15 high-priority interventions that could initially be prioritised in the rollout of NHI, such as progressive involvement of general practitioners (GPs) through a capitation-based model, and further rollout of the Centralised Chronic Medicine Dispensing and Distribution (CCMDD) model.
- NHI holds the potential to bring down costs of expensive private services and make them more accessible by leveraging purchasing power and economies of scale. However, for this to happen Government needs to begin contracting with the private sector and prove these efficiency gains, for example through capitation-based arrangements with independent GPs.
- Government must regulate the private sector more effectively, for example, as laid out recently, by the Competition Commission’s market inquiry and by rejecting unjustified new hospital licenses putting in place stricter policies for public servants working for the private sector, and tightening a range of provisions relating to medical aids.
- Linked to this, progress must be made with development of a mixed public-private delivery platform, also to build greater acceptance for new taxes linked to NHI.

Figure 2 : Government revenue and expenditure as a percentage of GDP, South Africa, 1995/96 - 2021/22



Source: Based on National Treasury data, 2019.¹⁰ GDP = gross domestic product.

In the longer term, economic growth is important, as internationally there is a very strong correlation between GDP and health expenditure.¹¹⁻¹⁴ Efforts to improve growth should be encouraged but have a longer time perspective. In the medium- to long-term, it may be more feasible for Government to increase health financing by increasing prioritisation of health in budget allocations to bring South Africa closer to the Abuja target, namely allocating 15% of government's budget to health.¹⁵ Reference to potential new taxes were made above under the vision for revenue raising. Given that chronic diseases have become the largest national burden of disease, consideration may also be given to increasing excise taxes on unhealthy goods ('sin-taxes'), such as alcohol, tobacco and the recently introduced sugary beverage tax. Although a hard earmarking of this revenue is unlikely to be implemented, some international experience shows that public support for such taxes is stronger when a portion of the revenue is allocated to health interventions.^{16,17} For example, in the Philippines, increases in alcohol taxes helped to fund recent reforms in their health system.^{18,19} The pros of sin-taxes include reduced consumption of harmful substances, whereas cons include that they often do not raise large enough sums of revenue. Other longer-term options might include ultimately raising the tax-to-GDP ratio above 26% of GDP on main budget or introducing new mandatory social security contributions.²⁰ Although the tax-to-GDP ratio in South Africa is already slightly above the average for upper-middle income countries, it falls below that of high-income countries,²¹ and South Africa has a relatively poorly developed mandatory contributory social security system.²⁰

Gradual introduction of a pay-roll tax may be palatable if it accompanies improved quality and benefits, while the private sector fails to contain costs and therefore loses members. Such a tax can be a part of total revenue and need not be ring-fenced for health.



Challenge: low utilisation and performance of existing NHI allocations

Dedicated funding for NHI was first introduced in Budget 2012,²² through a direct conditional grant to provinces, which the following year was largely centralised to a new indirect conditional grant managed by the national Department.²³ The grant initially focused on contracting of GPs to work in public clinics and on infrastructure improvements in the 11 NHI pilot districts. The scope of the grant has, however, broadened over time, and in Budget 2018⁸ it received additional allocations of R4.2 billion and was restructured to have three components (Health Facility Revitalisation, Non-Personal Services, and Personal Services). Some of the funding (R12 million in 2019/20) was also earmarked in the NDoH's core budget to establish interim NHI management structures. As shown in Table 1, there has been considerable underspending of the NHI Grant.

Spending was to some degree increased by introducing new priorities in-year, such as the creation of three new components (HR Capacitation, Beds and Laundry Services, and HPV Vaccine) and shifting budgets away from underspending areas for this purpose.²⁴ Part of the reason why existing allocations are underspent is that the NHI Fund has not been established and capacity to contract services has not been sufficiently strengthened. In addition, there have been concerns about additional funding being dedicated to contracting private sector services when the public health sector is under significant financial strain (leading to some funding in the NHI grant being reallocated to human resource capacitation in the provinces).²⁵



Potential solutions

Given that underspending is largely a result of capacity limitations, addressing these limitations should be prioritised. Adequate financial and institutional

Table 1: South African health expenditure against NHI indirect grant allocations in 2018/19

Components	Original budget (R'000)	Adjusted budget (R'000)	Expenditure (R'000)	% spent (v. adjusted budget)
Health Facility Revitalisation Component	891 359	836 359	648 051	77%
Non-Personal Services Component	700 000	700 000	499 889	71%
Personal Services Component	712 500	391 500	247 234	63%
HR Capacitation Component	0	350 000	339 744	97%
Beds and Laundry Services Component	0	150 000	515	0.3%
HPV Vaccines Component	0	30 000	29 809	99%
Grand Total	2 303 859	2 457 859	1 765 241	77%

Source: National Treasury, 2019.²⁶
NHI = National Health Insurance.

capacities of the agencies managing NHI are essential, as seen in experience from other countries.²⁷ In order to improve spending and performance, existing and potentially additional allocations should be used to scale up capacity in the Department and build contracting and purchasing expertise, which can later be transitioned into the NHI Fund once it has been established as a public entity.

Pooling



Vision

The vision of NHI is to establish an NHI Fund as a single purchaser, where the majority of public funding for personal health services is pooled into the Fund to strategically (actively) purchase health services on behalf of the entire population. Revenue pooling is intended to maximise risk and income cross-subsidisation, increase purchasing power, reduce inefficiencies, and simplify funding flows.¹

Achievement of this vision will likely entail consolidation of a large portion of public revenue currently directed to health care, including through the equitable share paid to provincial and local governments, conditional grants, health service components of compensation funds such as the Road Accident Fund, medical scheme subsidies of public sector employees, and medical tax credits.

This vision also encompasses a degree of migration of medical scheme beneficiaries to NHI; once NHI is fully developed, it is envisaged that medical schemes will play a limited role.



Challenge: intergovernmental financing arrangements and legal provisions

While provincial-level pooling exists in countries such as Canada and Australia, South Africa has decided to create a national NHI Fund (along the lines of Thailand and South Korea). The pooling of health funding into a single NHI Fund will require changes to the current intergovernmental distribution of functions given that functional assignments and funding are integrally linked, i.e. 'funds' follow 'function'.

Section 227 of the Constitution²⁸ specifically entitles provinces (and local government) to an equitable share of revenue raised nationally to enable them to provide basic services and perform the functions allocated to them. Section 213 further stipulates that a province's equitable share must be a direct charge against the National Revenue Fund, meaning that it cannot be paid to the province via a national department or public entity. Substantial public funding for health can be pooled into a single NHI Fund through centralisation of those health functions that need to be centralised for NHI to work, including some functions currently assigned to provinces. This can be done through amendments to relevant health legislation. Schedule 4 of the Constitution only lists the broad areas of concurrent legislative competence ('health' for provinces and 'municipal health services' for local government), and the details

thereof are defined in the National Health Act of 2003.²⁹ It is therefore likely that no constitutional amendments are required for this shift and that amendments to health legislation would suffice. Ambulance services can, however, only be shifted from the provincial sphere through constitutional amendment, as this is listed as a functional area of exclusive provincial legislative competence in Schedule 5 of the Constitution.

The National Health Act (2003) currently assigns substantial health functions to provinces, including hospital services and comprehensive primary health services, and following basic education, health is the second largest expenditure item on provincial budgets. On average, provinces spend around a third of their budgets on health.³⁰ Though local government is predominantly responsible for the environmental health function, larger municipalities (mainly metropolitan municipalities) continue to provide personal health services in terms of specific transitional measures in the National Health Act, where the supporting service-level agreements with provinces for rendering these services are often seen by municipalities as insufficient to pay for all the services they provide.³¹ Appropriately assigning or re-assigning health functions between the three spheres of government is therefore critical for the successful implementation of NHI. Despite this, this topic has not been the focus of many discussions in recent years, largely because of its sensitive nature, i.e. this restructuring could substantially reconfigure the scope/mandate of provincial governments.



Potential solutions

In order to centralise public funding for personal health services to a public entity in the national sphere of government, such as the envisaged NHI Fund, the focus should first be on sorting out the functional assignments between the three spheres of government rather than on the funding mechanism, which is presently the case. This will require extensive legislative change around the functions of the spheres.

When a function is shifted, all funding attached to the identified function will shift, including equitable share and health conditional grants, and the relinquishing sphere is generally required to transfer all concomitant resources to the receiving sphere of government. When social grants and Further Education and Training (FET) colleges were centralised, provinces had no more responsibilities, nor received any funding for such functions. A more complex system could be envisaged for health under NHI, where the intention is to centralise certain functions in full (e.g. central hospitals), and with others (e.g. primary health care (PHC) and other hospitals) to appoint provincial administrations to perform the functions on behalf of the national sphere through delegation. Under a delegation arrangement, it may be possible to shift the funding to the NHI Fund without transferring personnel, infrastructure and other assets to the national sphere of government.

The complexity of re-assigning functions (with or without re-delegation) between spheres should, however, not be underestimated, but will vary in complexity. Shifting of the 10 central hospitals from provinces to the national sphere would be less complex legally than the reconfiguration of PHC, but one of the challenges to be resolved with the central hospital shift is that these hospitals generally also provide regional and district hospital services. The PHC platform currently includes approximately 3 500 clinics,³² a massive number of staff, and a budget exceeding R60 billion per annum (including HIV and AIDS),²⁵ which will need to be shifted to 52 new government components (District Health Management Offices), or potentially even 350 CUPs, while at the same time ensuring continued service delivery.

The transition towards centralised health functions required for central pooling holds major risk, given the decentralised nature of healthcare provision. Considerable attention will need to be given to establish decentralised structures such as districts, CUPs and semi-autonomous hospitals, as well as an improved system of delegations.



Challenge: potential reluctance of some medical scheme members to shift to NHI

A potential obstacle to NHI implementation may be reluctance of medical scheme members to give up their medical schemes and shift to NHI. While previous research has found that there is broad acceptance of NHI among the general population, medical scheme members have been found to be less supportive of NHI than public sector users.^{33,34} Such resistance may emanate from a number of factors, including perceptions among medical scheme beneficiaries that the shift may result in interruption of benefits or decreased access to private health care and the presumed lower quality of health services offered by the public sector. It may also emanate from a lack of trust in the integrity or sustainability of a publicly administered NHI Fund in the context of revelations of corruption, state capture and failing public entities within Government more broadly. The diagnostic report of the National Planning Commission and NHI White Paper identified leadership and governance challenges at various levels of Government.³⁵ Involuntarily compelling movement *en masse* to NHI by statutorily limiting benefit coverage of medical schemes is likely to risk widespread opposition among the 8.8 million beneficiaries³⁶ of medical schemes, potentially impeding or delaying NHI implementation through protracted litigation or tax avoidance.



Potential solutions

Universal health care reforms are complex, long-term policy engagements, and international experience shows step-by-step approaches are often preferable in order to gain political support from key interest groups.³⁷ Acceptance of NHI by healthcare users is likely to evolve over time and will depend on the benefits and quality of services offered. It is advisable to introduce NHI incrementally, starting with consolidation of public funding sources and demonstrating the capacity of the Fund to

manage funds effectively and ensure access to health services for beneficiaries, focusing also on services that are likely to be attractive (e.g. access to their own GPs through the capitation model). It has previously been argued that the acceptability of NHI depends on its ability to demonstrate significant advantages over existing services offered in the public sector.³⁸ In this way, beneficiaries of medical schemes will progressively gain confidence in NHI. In addition, many people are finding it progressively difficult to afford private medical aids and membership is now stagnating.³⁶ Once NHI is fully rolled out and widely trusted, statutory restriction of the role of medical schemes could be considered.

The virtual absence of strategic purchasing (discussed further below) from private providers makes it difficult to proceed rapidly with mandatory pooling of resources currently paid by members to private medical schemes.

Purchasing



Vision

The idea of a purchaser/provider split is central to the NHI reform. Purchasing/budgeting and provision are currently institutionally integrated in the public sector, and the idea is to split these functions in order to contractually tie funding to specific outputs and services. The NHI Fund will act as a purchaser of health services for and on behalf of the population, while provinces/institutions and private entities will act as providers. CUPs are to be the contracting party on the provider side for PHC services, which will simplify contracting compared with individual contracts between the NHI Fund and each of the 3 500 PHC facilities in the public sector.¹ In the event that the CUP system proves impracticable or where specific CUPs do not have sufficient capacity, the district health management office will contract with the NHI Fund. The way in which health services are purchased will be reformed and become more strategic and active, by contractually linking this to performance, efficiency, workloads and case-mix. More specifically:

- PHC services will be purchased using risk-based capitation.
- Hospital services will be purchased through Diagnosis-Related Groups (DRGs).

The White Paper envisages that the NHI Fund will purchase services from both public and private providers, and by virtue of its size take advantage of its bargaining power to improve efficiencies and value for money. As a single purchaser, one of the main objectives of its purchasing functions will be to improve geographical and socio-economic equity in access to healthcare services.



Challenge: lack of technical skills and information systems for strategic purchasing

International experience shows that movement towards UHC requires significant technical know-how.³⁷ Weak technical skills and understanding of strategic purchasing and its relevance at all levels of government

remains a key challenge in the roll-out of NHI. Currently, purchasing and provision function in an integrated manner, with no purchaser/provider split introduced, little strategic purchasing, and DRGs and capitation payment methods have not yet been implemented.

While some efforts have been made to develop both capitation models for PHC purchasing and a DRG model for hospital purchasing, piloting or implementation of these models has not taken off and there is still little practical know-how of strategic purchasing in government.

Strategic purchasing is data-driven³⁹ and requires intensified collection and use of data and improved information systems. There has been some notable progress with the roll-out of a health patient registration system in over 3 000 public health facilities, with approximately 40 million patients registered and assigned a unique identifier.⁴⁰ However, there are still issues related to information and communications technology (ICT) infrastructure, connectivity, basic ICT literacy, and centralised registries with unique identifiers for providers and facilities. Previous research also found International Classification of Disease (ICD) coding, generally a requirement for implementing DRGs at central hospitals, to be both incomplete and inaccurate.⁴¹ The introduction of strategic purchasing within the public sector entails a substantial set of reforms, and the way these are designed and implemented will determine the degree to which these reforms will end up generating greater efficiency.



Potential solutions

There is an urgent need to build purchasing capacity within government, which will transition to the NHI Fund once this is set up. In the short term, this will improve management and implementation of existing NHI allocations and activities. The new Minister of Health's plan to rapidly establish an NHI implementation unit could be a game changer in this regard.⁴² Over the long term, it will provide the expertise required during the transition from the current delivery model to NHI. Contracting out services to independent GPs has not yet taken place and needs to be fast-tracked, as the model needs constant refinement through a number of iterations. In the public sector, increased use of needs-adjusted population-based allocation of resources across districts should be encouraged. Under the current arrangement, this can be done by provincial departments of health with national technical support, and more formally later by the NHI Fund. In addition to improving readiness for NHI, this has the potential to improve equity in resource distribution, also in the short to medium term.^{43,44}

Establishment and further development and linkage of patient, provider and facility registries and agreement on adoption of coding systems for diagnosis (e.g. ICD) and interventions (e.g. International Classification of Health Interventions (ICHI)) are fundamental for enrolment,

electronic health records and provider contacting/payments. Plans to upgrade ICT infrastructure and digital health skills across the levels of care need to be further developed and rolled out urgently. An all-encompassing national data system is not necessarily needed or preferable, but certain components of it, such as patient and provider registries, should be centrally developed. Most other systems do not have to be the same for the whole country, so long as they are interoperable and provide minimum data needed such as diagnostic and therapeutic coding required for strategic purchasing.



Challenge: lack of progress with purchasing from private providers

Despite funds being allocated for this purpose, very little strategic purchasing from private providers has taken place as part of NHI piloting and implementation to date. This may partly be the result of a preference towards public sector strengthening, but may also be due to the private sector often being significantly more expensive than the public sector. Direct comparisons of cost across the private and public sectors are confounded by a number of factors, but gross health per capita expenditure in South Africa is approximately four to five times higher in the private sector than the public sector.^a Reasons for the higher costs vary, but some of the key ones include higher doctor-to-patient ratio, lack of cost-effectiveness considerations (e.g. the caesarean section rate of >60% in 2017,³⁶ compared with 26% in the public sector⁴⁵ and 21% globally,⁴⁶ and an intensive care unit (ICU) bed hospitalisation rate that is much higher than that in most Organisation for Economic Co-operation and Development (OECD) countries⁴⁷), and lower pharmaceutical prices in the public sector. Lack of price regulation and fee-for-service payment are also a problem in the private sector in South Africa, like in several other countries.⁴⁸ The Preliminary Health Market Inquiry Report⁴⁷ has been critical of Government's failure at 'multiple levels' to regulate the private sector effectively and safeguard the rights of health service users.



Potential solutions

Strategic purchasing has at its heart the objective of bringing down high prices and achieving greater value for money. The ability of NHI to substitute some of the existing 4% of GDP for private health financing with a common NHI pool, is substantially dependent on its ability to offer services, such as GPs, medicine and specialist services that existing medical scheme members want to use, but at prices that allow for wider population access. Strategic purchasing under NHI could be an effective instrument for influencing provider behaviours, requiring them to share data and information to foster transparency and accountability. In return, private sector providers get access to a larger market of users under NHI. The design of purchasing mechanisms and geographical selection of providers will need to take socio-economic and geographical equity implications into account.

a Authors' calculations based on National Treasury data.

Implementation of capitation-based contracts with private PHC providers, such as GPs, either through CUPs or through other arrangements, is a priority. Research has shown that GPs in solo and group practices can contract with NHI at competitive rates.⁴⁹ A risk-adjusted capitation-based model would incentivise providers to ration service provision with more affordable criteria, standards and protocols and nudge providers towards the most cost-effective services, such as preventive care and PHC services. In designing and implementing GP capitation arrangements, consideration needs to be given to avoiding some of the problems of episodic and largely curative-based care that existed under the old district surgeon system.

Attempts to develop a DRG reimbursement system for hospitals have been slow to progress and need to be put back on track urgently. The data needs for DRG implementation require accurate diagnosis and procedural coding and it is therefore important that such systems are put in place urgently.

A positive example of contracting with the private sector where progress has been made is the Centralised Chronic Medicine Dispensing and Distribution (CCMDD) model; this has allowed stable patients on antiretroviral therapy (ART) and chronic treatment to collect their medicine from private pharmacies and other selected pick-up-points instead of visiting public sector clinics every month. This model has significantly decreased the need to queue and reduced waiting times for patients to collect medicines, which is of obvious benefit to patients, public facilities and private service providers.



Challenge: lack of progress with purchasing from public providers

There has also been little progress in implementing strategic purchasing mechanisms within the public sector. Healthcare services are funded through annual budget allocations and on an input basis rather than via mechanisms that reimburse providers based on services provided. There are no case-based payments for hospital services or risk-adjusted capitation-based payments for PHC. Insufficient attention has been given to the future institutional form of public hospitals to enable them to contract directly with the future NHI Fund. The NHI Bill⁴ outlines the legal framework, powers and functions for CUPs in broad terms, but more detailed plans for their configuration are still to be developed.



Potential solutions

The vision of NHI is for provider-payment mechanisms such as DRGs and capitation to be applied also to public providers, and steps in this direction do not need to wait for the NHI Fund to be established. Greater use of contracting at all levels of the public health system would improve accountability, and link financing to performance more successfully. Cleverly designed purchasing arrangements within the public sector have

the potential to improve efficiency and could make the public sector more responsive to user demands. These arrangements must have safeguards to ensure improved equity and that the needs of the poor and rural public are addressed. Although there are practical implementation difficulties in implementing strategic purchasing within the public sector environment, there are good international examples of such models in middle-income countries, for example the DRG and capitation systems in Thailand.⁵⁰ One area where DRGs could potentially be implemented in the medium term is the National Tertiary Services Grant, which subsidises public tertiary and central hospitals. Provinces could also introduce some form of capitation-like system for district budgeting for PHC services, by using needs-based formulae based on the size and risk profile of the district population in resource allocations. Capitation payments can be complemented with performance-based payments, e.g. for reducing unnecessary referrals and meeting targets for prevention services. Consideration needs to be given to the structure and resourcing required to enable functioning CUPs and to the legislative changes mentioned above.

Provision



Vision

The NHI White Paper devotes significant attention to the provision and reorganisation of healthcare service delivery to achieve coverage of the population for comprehensive healthcare services. It envisages an integrated provision platform where the NHI Fund contracts directly with accredited providers in both the public and private sectors.

The vision of NHI is to place PHC providers at the core of healthcare services and ensure that individuals access care as close as possible to where they reside. In addition to PHC, NHI will contract with accredited hospitals in both the public and private sectors and ensure that access to hospital services will be through referral by PHC providers.



Challenge: inadequate quality of care in the public sector

While supportive of NHI, some stakeholders are of the view that NHI will not function optimally until quality in the public sector is first drastically improved.^{51,52} Similar points have been made by international scholars, who have argued that expanding coverage must go hand in hand with improving health system performance, often including strengthening of the public sector.⁵³ Several assessments, including those performed by the Office of Health Standards Compliance (OHSC), have exposed severe challenges in the public sector that include fragmentation, non-responsiveness, poor performance, and wasteful allocation and use of resources. Of the facilities inspected, 62.5% were found to be either non-compliant or critically non-compliant with norms and standards, and an additional 23% were conditionally compliant with serious concerns. Figure 3 shows that in 2016/17, the average score across 851 facility inspections was only 52%.⁵⁴



Potential solutions

The Government has launched several programmes to strengthen PHC services, the most recent being the Ideal Clinic programme. While an important step in recent years was the establishment of the OHSC, Government needs a stronger system for addressing the shortfalls identified during OHSC inspections, through complaints and elsewhere. This will be important to enable public facilities to meet prescribed standards for certification by the OHSC and contracting by the NHI. The OHSC is a new institution in South Africa and there is a need to develop a culture of learning in the public sector.

In 2018, stewardship of the NHI reform was partly moved to the Presidency,^{55,56} and since then both the Presidency and the NDoH have increasingly focused on improving quality of public health facilities.⁵⁷ This will require additional resources to address problems identified during OHSC audits and improve quality of care. Among other things, funds have already been reprioritised from the NHI Grant towards frontline service provision through filling critical posts at various levels of care and procuring beds and linen for hospitals.²⁴ A greatly strengthened system of

delegations is required to enable public sector managers to better manage and take accountability for their institutions, and legal reforms are required to create new statutory forms for public hospitals to enable them to contract formally with the NHI Fund.

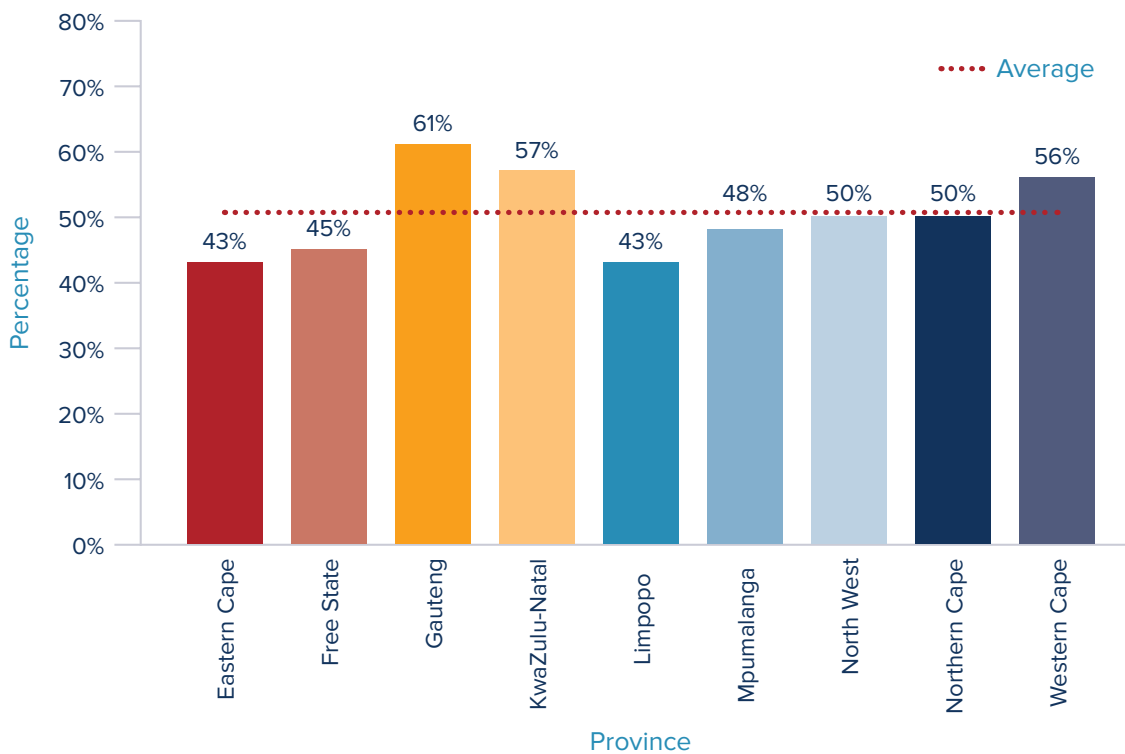


Challenge: limited integration of private providers in the publicly funded provision platform

Although the White Paper envisages private providers as an integral part of the provision platform under NHI, in practice the private sector's involvement to date has been very limited, and ambiguous messages about the role of the private sector have been projected, as noted by both civil society and comments from industry stakeholders.^{58,59} Contracting with private providers during the NHI pilots has largely been limited to contracting doctors to work sessions in public PHC facilities rather than strategic purchasing of services in private facilities.

Development of the NHI policy has been done almost in isolation of private providers, and consultation with private sector providers has largely been indirect, often through

Figure 3: Average OHSC inspection scores by province, South Africa, 2016/17



Source: OHSC, 2018.⁵⁴
OHSC = Office of Health Standards Compliance.

them submitting public comments in response to the release of policy papers. This has resulted in mistrust and confusion between private providers and Government when it comes to NHI.⁶⁰⁻⁶² There are also insufficient platforms, arrangements or clinical pathways in place for ensuring continuum of care across the service delivery levels (primary, secondary and tertiary) and across the public and private sectors.



Potential solutions

Going forward, it could benefit the NHI process for Government to collaborate more closely with private providers and to recognise them as critical partners in rolling out NHI. The private sector should also be prepared to progressively take a bigger role in service provision beyond the medical scheme population by, for instance, showing a willingness to offer more favourable prices in exchange for higher patient volumes from the public sector and the poor, who are unable to afford medical scheme contributions.

If Government starts purchasing strategically from private providers, this can provide a lever to incentivise reform of the sector. For example, incentives for private solo GP practices to arrange themselves in multidisciplinary group practices or to utilise nurse practitioners, and for hospitals and doctors to work in a more integrated manner, should be explored. Purchasing services for the entire population will create a demand for private providers to establish in rural and less affluent areas of the country, perhaps also through specific incentives in reimbursement rates.

Conclusions

NHI has the potential to fundamentally transform the South African health sector to a more integrated, equitable and cost-effective system than the two-tiered system currently in place. While the end goals of NHI are laid out in the White Paper, the immediate practical steps to move in this direction need to be articulated more clearly and few such steps have been taken substantially. Providers and users of health services are critical NHI partners and there is anxiety among stakeholders as the Government has not managed to effectively and coherently communicate what NHI means, what range of health services will be provided, what the financial contributions will be, how the quality of services will be ensured, and what the role of health providers and workers will be in public and private sectors.⁶³ An NHI implementation roadmap must be finalised urgently, outlining a time-bound framework of how NHI will be rolled out, namely what the key activities and tangible deliverables are, and how these activities will be completed and by whom.

The chapter has identified several important challenges impeding progress on NHI, including:

- Difficulties in centralising funding in a national NHI Fund given the existing provincialised health financing system.
- Insufficient progress in building capacity to manage NHI, especially in strategic purchasing, management and information systems.
- Mistrust between government and the private sector and slow progress in building a mixed delivery platform, such as capitation arrangements with independent GPs.
- Weaknesses in public sector provision and quality.

There are no definitive answers to several of the key questions related to the reform, such as the ideal balance between public and private provision and the pace at which to phase in the reform. However, the chapter has attempted to propose some practical solutions to the challenges identified, in the hope that these can help accelerate implementation of NHI.

Recommendations

Key recommendations emanating from this analysis include the following:

- The legal aspects pertaining to the allocation of health functions under NHI need to be resolved urgently.
- The sector should scale up contracting and strategic purchasing from both public and private providers. This can be done incrementally under the current health system arrangements and does not have to wait until the NHI Fund is legally established.
- Capacity needs to be developed, primarily in the NDoH, to perform these purchasing functions. A strong NHI unit needs to be built within the NDoH, which can later be transferred to the NHI Fund once established.
- There is a need to accelerate the groundwork related to ICT-based integrated information systems, including further development or creation of registries as well as agreement on adoption of standardised coding systems for classification of diagnoses and interventions.
- NHI should be built incrementally and demonstrate benefits to the public. Priority should be given to gradually increasing access to a wider range of providers, such as private GPs contracted through capitation.
- The quality agenda driven jointly by the Presidency and the NDoH should be prioritised in order to strengthen the public sector in preparation for accreditation and contracting under NHI.

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Establishing the NHI Service Benefits Framework: lessons learnt and stakeholder engagement

Authors

Jeanne-Marie Tuckerⁱ
Kalipso Chalkidouⁱⁱ
Yogan Pillayⁱⁱⁱ

The NHI Service Benefits Framework documents the conditions, services, and care pathways reflected in existing national clinical policy, and the minimum or average required resources.

The South African Government has committed to accelerated progress towards universal health coverage, ensuring equitable access to quality and affordable healthcare services for all South Africans, based on need. This goal is being pursued through the phased introduction of National Health Insurance and alignment of what have historically been two parallel health systems in South Africa – public and private. It is a critical step towards addressing one of the most enduring structural legacies of apartheid, which is a key factor underlying South Africa’s status as the country with the highest level of inequality in the world. In August 2019, the NHI Bill was presented to Parliament, marking the latest step in the process of legislative reform.

This chapter provides an overview of ongoing work by the National Department of Health to develop what is internationally referred to as a ‘health benefits package’ but what in South Africa is referred to as the ‘Service Benefits’ to be provided under NHI. This is an explicit definition or list

of conditions and the associated healthcare services that will be purchased by the NHI Fund on behalf of all South Africans, and provided by public and private providers across the country.

An overview is given of the process of designing and developing the Service Benefits Framework, and the role of the Framework as a tool supporting good governance in benefit design. The chapter outlines lessons learnt by the National Department of Health including the critical role of stakeholder engagement; the need for the adoption of standardised nomenclature and classification systems to support definition of the service benefits; the need to strengthen and align the process of policy development across all areas of health; and the establishment of health-management information systems that are aligned with the service benefits and that can thereby support planning for and delivery of these services, as well as monitoring and evaluation of results.

Introduction

South Africa is grappling with the immense task of transforming what have historically been two parallel health systems – public and private – into a unified health system that serves the needs of all South Africans and accelerates progress towards universal health coverage (UHC).¹ The policy driving this transformation is National Health Insurance (NHI).

From the start it was intended that NHI implementation would be phased; however, the rate of progress has been slower than anticipated.² Arguably, one of the reasons has been the absence of an explicit definition or list of conditions and associated healthcare services to be covered under NHI and provided by public and private sector providers in South Africa. If positioned at the centre of NHI reform, an explicit list of benefits would have enabled a wide range of national health sector stakeholders to engage actively in a discourse on what NHI will offer and what their respective roles could and should be in this new paradigm.

In recognition of this gap and building on the work of NHI Workstream 2 (2015 - 2017),³ the National Department of Health (NDoH) developed the NHI Service Benefits Framework (SBF), which documents the conditions, services, and care pathways reflected in existing national clinical policy, and the minimum or average required resources associated with their delivery, also as per existing national health policy. This is considered a key starting point given the commitment by the NDoH that the range of services funded under NHI will be no less than currently available in the public sector.⁴ The SBF will also provide a definitive baseline from which to revise these services over time.

The initial intended audience of the SBF is policymakers and planners in the NDoH who will use the Framework to drive alignment across policy, and operational and financial planning, both under the current health system and through the transition to full implementation of NHI. The content of the SBF will also be used together with data on burden of disease and demography to inform needs-based scenario analysis/forecasting (e.g. human resources, commodities, etc.) for units of analysis ranging from contracting units for primary health care (CUPs), to district, provincial, and national level. In this way, the SBF will enable ongoing costing of scenarios for NHI delivery in South Africa.

However, the intention is ultimately for this information to be made available to all health sector stakeholders, including the general public (to look up what services are available and where); public and private providers (to provide transparency on cost assumptions and inform resource planning); clinicians (to utilise clinical protocols and care pathways and support adherence to referral policies); medical schemes (to provide market certainty on what are ‘complementary’ services);¹ and regulators

(to support governance, including clinical governance), etc. Having access to this information will ensure that these stakeholders have a common understanding of current policy and guidelines, and in this way support them to participate actively in discussion and debate on where and how these should be revised over time.

This chapter provides an overview of the development of the NHI SBF since its inception in 2016. It describes the origin and the resulting design or ‘shape’ of the service benefits; and lists three lessons learnt by the NDoH, with particular focus on the critical role of stakeholder engagement across NDoH directorates. The review provides a recommendation linked to this lesson, namely to similarly implement engagement with all national health sector stakeholders as the structure and content of the SBF is further refined and expanded. This process will make provision for incremental reduction in fragmentation of service benefit definition across the public and private sector, but also help to build trust, establish buy-in, leverage complementary expertise held in the private sector, and build a common understanding that will enable a smoother transition to NHI. This engagement should focus on the development of a single set of service benefits funded under NHI and delivered by public and private sector providers to all South Africans, and discussion on how existing roles and responsibilities must evolve to allow for the establishment of a single unified health system.

Development of the NHI Service Benefits Framework

Origin: NHI Workstream 2

Technical work to define the NHI service benefits started in the Ministerial Committee on NHI.⁴ Thereafter, the NHI SBF was conceived by one of the six NHI workstreams (2015 - 2017) established by the Minister of Health.³ The terms of reference for Workstream 2 included directives to develop an approach to health benefits policy drawing on best practice; to cost these services; and to establish health technology assessment (HTA) capacity for clinical interventions, pharmaceuticals and technologies. Emphasis was placed on the need to build on the extensive work already done by the NDoH on “packages of services in Primary Health Care (PHC) and priority programmes”.³

The Workstream drew guidance from the 2017 NHI White Paper,⁵ which indicated that the service benefits should be defined by level of care and with particular emphasis on driving efficiency through establishment of gate-keeping at the PHC level; the White Paper also stated the need to ensure equitable access and patient-centred care through the articulation of patient care pathways aligned with clinical practice guidelines, thereby highlighting the relationship between the service benefits and referral policy. Members of

the Workstream agreed that the Framework should provide the baseline against which to identify and begin application of priority setting for resource allocation, including through use of HTA.

The 18-month timeframe of Workstream 2 was sufficient to deliver a first iteration of the NHI SBF as well as costed scenarios for development of an HTA body to support national HTA capacity development and ongoing review of these services through a defined and transparent priority-setting process. Thereafter, further resources were dedicated to expanding and refining the SBF in preparation for the establishment of the gazetted national advisory committees on healthcare benefits intended to advance the work of Workstream 2, as well as the advisory committees for pricing and HTA.⁶ This work was done in consultation with the medical scheme regulator, the Council for Medical Schemes (CMS) and the prescribed minimum benefits (PMB) Advisory Committee formed in 2017.⁷ Publishing of the NHI Bill in August 2019 and establishment of the NHI Fund Office have reaffirmed commitment to the establishment of an HTA agency, benefits advisory and pricing committees as well as interim ministerial committees for healthcare benefits and HTA.¹

Benefits structure: services and care pathways

Development of the Framework started with the definition of facility-based PHC services; to this end a review was done of the available national clinical guidelines to assess which, if any, could provide the foundation for the Framework. The 2014 edition of the national Standard Treatment Guidelines for PHC (STG-PHC) (later updated to reflect the 2018 edition) was chosen as the primary clinical data source.⁸ The STG-PHC is one of the implementation tools for the Essential Medicines List (EML)⁹, together with Standard Treatment Guidelines for Hospitals (Adult⁹ and Paediatric¹⁰ versions), and the EML for Tertiary and Quaternary Level.¹¹

The STG-PHC was chosen based on three characteristics. Firstly, in terms of the burden of disease addressed at PHC level, this one document reflects the widest scope of clinical guidelines applicable in South Africa. Secondly, as a foundational element of the EML development process, the medicine-related content has been driven by a selection process that incorporates priority-setting. Thirdly, the extent of detail provided over and above treatment directives supports efforts to align clinical guidance with resource input-related policy and thereby generate evidence-linked costing specific to the South African public sector setting. Although not uniformly available or explicit, this detail in the STG-PHC includes data on the condition and/or service for which care is available including International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), the body system to which this applies, the average number of visits, key clinical steps per visit, and referral criteria. The primary limitation of using the STG-PHC is that as an implementation tool for the EML, the conditions listed are facility-based and treatment oriented. Therefore, it was acknowledged that to complete a full list

of PHC services, subsequent supplementation with other community-based and prevention-service guidelines would be required.

South Africa experiences what is often referred to as a 'quadruple burden of disease'.¹² This includes HIV and TB; maternal and communicable diseases; non-communicable diseases; and injury and trauma. Development of the Framework began by linking each condition with associated at-risk populations defined in terms of the quadruple burden categories, and the relevant age groups or life stages. Thereafter, the care pathway associated with each condition and at-risk population was translated from clinical terminology into lay-person terms. The intention was to ensure that any person working in the health sector without a clinical background, could understand the content, and thereby engage with the Framework and use the data it provided. For example, a non-clinical manager working in a district office or a CUP would be able track PHC gate-keeping by understanding which patients could be seen at PHC level, and which required referral to a higher level. Similarly, a public health professional could analyse the conditions for which care was available for a particular at-risk population, e.g. neonate, infants, pregnant women. The result was a data structure that supports an explicitly defined and easy-to-communicate set of service benefits, reflected in Figure 1. The SBF includes the total number of visits expected for a condition or service as it applies to an age group or life stage and for each visit; the lowest level of the health system at which the care can be provided; and the associated clinical steps and referral criteria.

Costing structure: per-patient clinical resource inputs

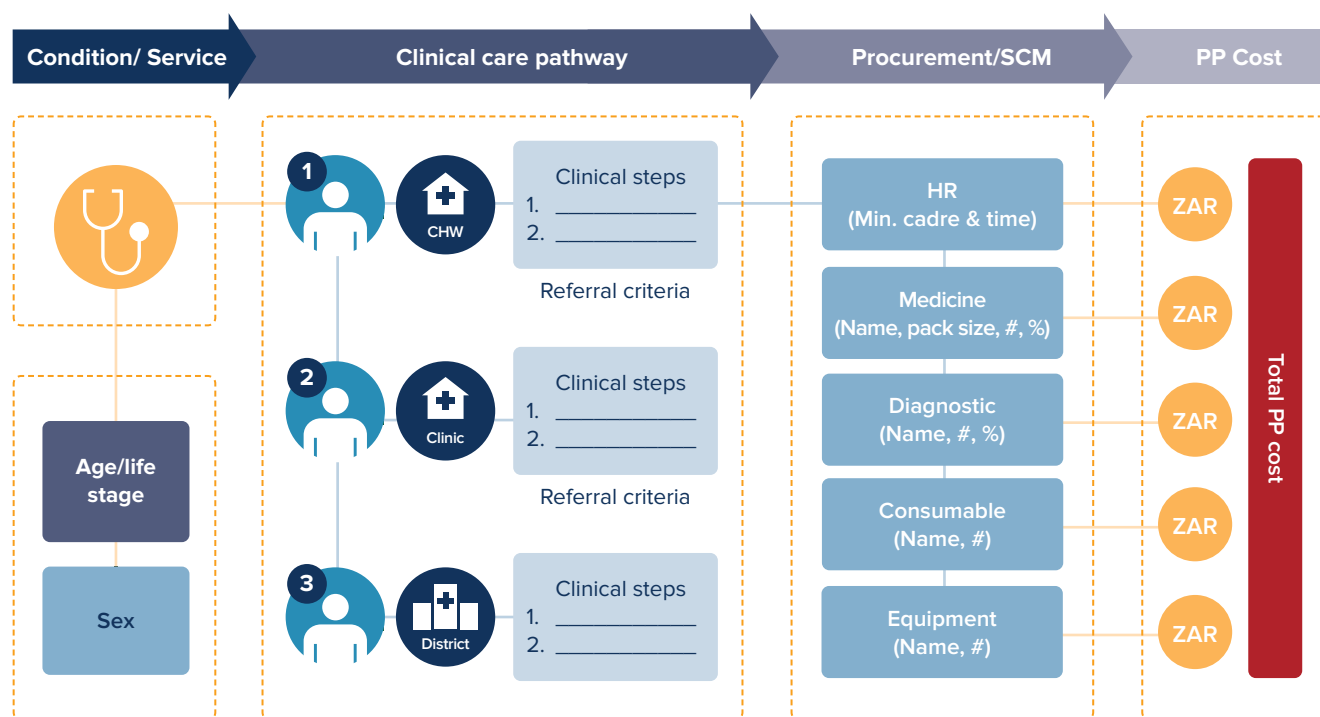
Having an explicitly defined set of PHC benefits provided the first opportunity to build a costings database for NHI in South Africa. The proposed approach was to focus initially on the direct clinical resources required per patient visit (i.e. medicines, consumables, and diagnostics) to which unit costs could be linked so as to calculate per-patient direct costs. The intention was to then add further inputs reflecting shared clinical resources (i.e. equipment and human resources), which together with population and burden-of-disease data, could be used to estimate the additional per-patient cost for a defined population. It was acknowledged that the per-patient costing methodology would ultimately also have to account for a range of co-morbidities. The approach excluded fixed capital and left calculation of overhead/administration costs to the final step, suggesting that this be dependent on the final management structure supporting NHI rollout and that it be capped at a percentage of service-delivery cost.

Work to date has culminated in the determination of all direct and shared per-patient resource inputs required to provide services at each visit, as shown in Figure 1. These resource inputs were initially deduced from the STG-PHC and then mapped to explicit items as reflected in the available resource-related policy documents.

The intention was to ensure that the content is recognisable to procurement, supply chain and finance managers, and enables them to understand how the resources they oversee link to delivery of care for specific patient conditions seen at specific levels of the health system. All data sources are listed in Table 1.

The next step in development of the SBF is to assign unit costs to each input. These will be the national cost as per current awarded tenders and the Department of Public Service and Administration personnel rates. The intention is to establish a baseline of current or 'actual' per-patient costs and an estimate of total cost against which to conduct a

Figure 1: South African NHI Service Benefits Framework structure, 2019



HR = human resources; PP = per patient; SCM = supply chain management.

Table 1: South African NHI Service Benefits Framework data sources, 2019

Data	National policy or guideline data source	Unit cost data source
Health condition/service	Essential Medicines List and Standard Treatment Guidelines, 2018 ⁸	N/A (Calculated)
Human resources	Profession: Subset based on Department of Public Service and Administration cadres and Clinical Scopes of Practise Time: Clinical expertise (No existing policy)	Department of Public Service and Administration Salary Scale
Medicine	Name and dosage: Essential Medicines List and Standard Treatment Guidelines, 2018 ⁸	Master Procurement Catalogue
Laboratory	Essential Laboratory List for PHC	National Health Laboratory Tariff List
Consumables	National Health Commodities Catalogue for PHC ¹³	Master Procurement Catalogue
Equipment	National Health Commodities Catalogue for PHC ¹³	National Tenders

range of comparative analyses within the public sector. One of the analyses would be to compare the total estimated cost of full coverage with the current size and distribution of the health budget to estimate the discrepancies in funded priorities (allocative efficiency). Another analysis would be to identify where/how savings could be achieved through improved pricing and procurement negotiations (technical efficiency). A further analysis would assess the equity implications of subnational procurement by comparing national commodity price lists with provincial ones to assess the current range in costs of particular services across provinces. The process of linking these costs to resource inputs is currently underway.

Expanding beyond PHC

Beginning the development of the SBF with a focus on PHC was an explicit decision taken for three reasons. The first reason was the explicit directive in the Workstream 2 terms of reference to build on existing work already done by the NDoH on PHC programmes.³ A second was the recognition of PHC as the foundation and ‘heart-beat’ of NHI and that a focus on this would help address equity considerations.⁵ A third reason was that in defining the service benefits to align with national clinical guidelines and care pathways, this necessarily required beginning with the entry point to the health system for each condition, which outside of emergency, would be PHC. Beginning with PHC also had the benefit of providing a clear picture of how and where gate-keeping should apply which, when compared with current practices, would highlight the extent of efficiencies that could be realised by seeing patients at the appropriate level of care.

That said, it is envisaged that the SBF will extend beyond PHC to hospital services. This will introduce a greater level of complexity to the structure and costing methodology employed. At the same time, it will ensure that the full set of service benefits are articulated including priority programmes that involve specialised care. This means that, compared with the typically high volume but low cost services provided at PHC level, low volume and high cost services would also be explicitly defined and are likely to be the content to which HTA is applied as a priority. The latter is the content to which full HTA included in the Bill is likely to be applied.

Early lessons learnt

Development of the SBF is ongoing and iterative, but three early lessons can and should inform how this work is taken forward. The first lesson relates to the critical role of stakeholder engagement in benefit design and review. The second and third lessons relate to the structure of the SBF and the need for national alignment across policy, strategy, guidelines, and associated health-management information systems (HMIS).

Firstly, as the initial terms of reference for Workstream 2 indicated, there was indeed extensive groundwork on which to build; however, it has quickly become apparent that the current national guidelines and policy documents do not always speak to one another. This has, in turn, highlighted the extent of broad stakeholder engagement and participation required across directorates within the NDoH to develop the SBF, i.e. before turning to wider stakeholders at provincial level or in the private sector and civil society.

In the case of clinical guidance, the documentation review highlighted the existence of more than a hundred national clinical practice guidelines variously developed, adopted or endorsed by the NDoH but with little or no documented guidance on the role or development process of these guidelines compared with the STG-PHC. There was concern that in the absence of such guidance there may be ambiguities at best or misalignment at worst.

In the case of resource input policies and guidelines, the document review showed an essential laboratory list for PHC and the Workload Indicator of Staffing Norms (WISN) for particular levels of care, but there was no documentation on how or whether these were aligned with the clinical guidelines. The National Health Commodities Catalogue for PHC Facilities¹³ developed in 2019, which details the equipment and consumables to be available in PHC facilities, is similarly not aligned with clinical guidelines. Furthermore, these lists do not appear to be systematically linked to HMIS supporting procurement or supply chain management of the listed items, resulting in further ambiguity.

A second lesson drawn from stakeholder consultations with NDoH directorates was that the structure of the SBF, based directly on the STG-PHC, will not be fit for purpose as a national data structure for service benefits in the long term. One reason is that the current structure is not consistent or hierarchical, as the STG-PHC was not designed with this objective. However, stakeholder engagement has provided valuable knowledge on the extent of data required by different directorates. This will need to be consolidated using standardised nomenclature, and in time adoption of national coding and classification schema, to create a single national data architecture that supports national coordination of healthcare services. It will be critical that the schema together provide a level of detail that supports clinical governance to address quality of care; however, the schema should also provide sufficient scope and thereby incentives for providers to pursue and realise efficiency gains in the public sector and drive down prices in the private sector. This work will be led by the NHI Fund Office and Advisory Committees, with preparatory work on an alignment process for the public and private sector benefits underway through collaboration between the NDoH and CMS. This is in recognition that the structure of the private sector PMBs are also not fit for purpose to pursue UHC.

A third lesson was the need to standardise and align processes proactively for the development of national policy, strategy and guidelines, and to ensure that the content of these documents is used to inform the design of all associated HMIS. This is to ensure a linkage between policy decisions on adoption and roll-out of services on the one hand (e.g. feasibility or scenario analyses), and subsequent monitoring and evaluation of service delivery on the other. Work is already underway with the development by the NDoH of a Policy Information Management System that will serve two purposes, namely to store and manage all health-related policy, strategy and guidelines and ultimately feed directly into the SBF, and to provide a standardised protocol for development of each of these types of documents.

Finally, while not a lesson in itself, what has become increasingly apparent is the role that the SBF can play in supporting good governance as it applies to benefit design. Following a multi-stakeholder engagement process involving researchers and policymakers from a range of countries including South Africa, all committed to UHC, the Center for Global Development (CGD) defines good governance as an environment that upholds three principles: transparency, consistency or coherence, and participation.¹⁴

- **Transparency** means that people are not only able to access information and understand the service entitlements, but also the implications of these entitlements for themselves and the wider population. In this way, transparency becomes a prerequisite for social solidarity and legitimacy of decisions as well as a necessary condition for holding those who make the decisions accountable against the national commitment to UHC and equity. Ensuring transparency must therefore extend beyond ensuring that information is available to ensuring that it is relevant, timely, up-to-date and understandable to the range of national health sector audiences. The CGD notes that this has been shown to not only build awareness and offer an opportunity for health education, but also to strengthen public trust in the health system and reduce any margin for bias. This was the initial thinking behind translating the clinical content of the STG-PHC into a format that could be understood by non-clinicians.
- **Consistency** relates to ensuring that where information is provided, there are no contradictions or ambiguity. This means ensuring that all stakeholders have a clear and common understanding of the services, which in turn supports coordination and allows for improved decision-making. This was exactly the challenge identified in the wide range of national clinical guidelines and policy, and addressed through stakeholder engagement across the NDoH directorates. Finally, transparency and consistency ultimately enable participation.

- **Participation** ensures that the service benefits are defensible in a democratic society. Participation also increases the chance of successful implementation of legitimate and defensible, albeit difficult, allocation decisions.

Recommendation: national stakeholder engagement and participation

The need for stakeholder engagement in benefit design across the different directorates within the NDoH is equally, if not more, relevant than bringing alignment across the spheres of government and across the public and private sector as NHI is implemented. However, each of these stakeholder engagements will be that much more complex than the NDoH directorate engagements, for different reasons.

In the first case, engagement across NDoH directorates was intended to understand and drive alignment of existing policy related purely to service delivery. Therefore, the primary objective of the process was to gather and synthesise existing policy, guidelines and supporting documentation. In contrast, the objective of stakeholder consultation with the different spheres of Government will be to unpack inherently complex systems and concurrent functions between national and provincial government with a view to restructuring them. This will also be related not just to service delivery, but also to management of funds. This is particularly critical given the imperative to ensure that the funds available are sufficient to address population health needs, which will likely differ across the country based on factors such as population size and distribution, burden of disease, and unmet need. For this reason, introduction of the NHI Bill will itself require the repeal or amendment of multiple other laws.¹

In the second case, while there was fragmentation across NDoH directorates, the directorates were centralised around a single reporting authority and centrally located. In contrast, engagement with the private sector will involve an infinitely more fragmented group of stakeholders both geographically and in terms of allegiance. For example, the different types of private sector providers will need to come together to discuss how the combined benefits they currently provide, and/or their mode of delivery, will change to align with the NHI service benefits. This in turn will require balancing the need to ensure that existing medical scheme members are not disenfranchised, with recognition that the current mode of service delivery and supporting cost structures in the private sector are not sustainable.

A proactive approach to stakeholder engagement will also not be complete without establishment of a research agenda encompassing both methods and process-related research questions relating to the service benefits, but also a formative monitoring, evaluation and learning (MEL) framework that can help course-correct and demonstrate to all stakeholders the value of the approach to service benefits design and implementation. For example, specific research and capacity-building efforts can be assigned to a wide range of independent parties such as universities, the Medical Research Council, the Human Sciences Research Council, and civil society organisations, which are hardwired into the country's research and capacity-building infrastructure. The Department of Planning, Monitoring and Evaluation may also be able to make valuable contributions to the MEL framework by helping to review, evaluate and refine implementation in a constructive fashion.

As a result, the approach to stakeholder engagement on the NHI service benefits will necessarily depend on development and implementation of a clearly defined process for that engagement. In preparation for that time, the following section reflects on who the national health sector stakeholders are in South Africa and how they can be engaged most effectively to bring incremental alignment of service benefits under NHI.

Who are the stakeholder groups in South Africa?

Identification of stakeholder groups is crucial in any successful engagement process. A rule of thumb is to seek input from all those with a stake in the decisions of the policy in question. In South Africa, as in most countries introducing healthcare benefits reform, the first group must be citizens, who ought to know what healthcare services they can expect from providers under NHI. This issue of information asymmetry has been raised increasingly in public discourse in recent years and confirmed in the Competition Commission Health Market Inquiry (HMI) that found consumers to be “disempowered and uninformed”.¹⁵ Therefore, service users and their caregivers, and the broader citizenry who must navigate the health system, form a major stakeholder group.

Healthcare professionals across the public and private sector are another important constituency given their role in the implementation and scaling of the services benefits. They are represented by different national professional societies and the Health Professions and Nursing Councils of South Africa. Healthcare providers or establishments, both public and private, are similarly important constituencies. In the private sector, they are typically represented by hospital and general practitioner networks. Indeed, the private sector as a whole, including the healthcare products industry and the private medical scheme and insurance industry, currently account for over half of the total healthcare spending. These stakeholders are diverse, fragmented and often have controversial perspectives, but they are better understood

following completion of the Competition Commission HMI in 2019, and constitute an altogether crucial group of stakeholders with whom to engage.

In a country like South Africa where provinces have historically played a role in financing and overseeing the delivery of care, provincial authorities form another major group to be consulted. District health authorities, and the planned district health management offices, will also play an equally critical role as providers of the lowest level of service delivery coordination. The engagement of national regulators such as the Office of Health Standards Compliance, the Health Ombudsman and CMS are equally critical as are academia and the national research institutions listed earlier, which can support the creation of knowledge and provide evidence and thereby credibility to support implementation of particular initiatives. Several other groups situated further from the focus of the process but central to its success include a wide range of civil society organisations and the media, which are active and vocal in South Africa, as well as the Judiciary, Parliament and the leading political parties. Development partners will also be relevant from a local and global advocacy and market-shaping perspective.

Last, but not least, is the country's National Treasury. The National Treasury is a major commissioner and client of the ambitious effort to rationalise, make explicit, and cost the country's list of service benefits. Figure 2 shows some of the stakeholders crucial to the engagement process and tailoring of information in the NHI SBF.

What is the best way to engage with each of these stakeholders?

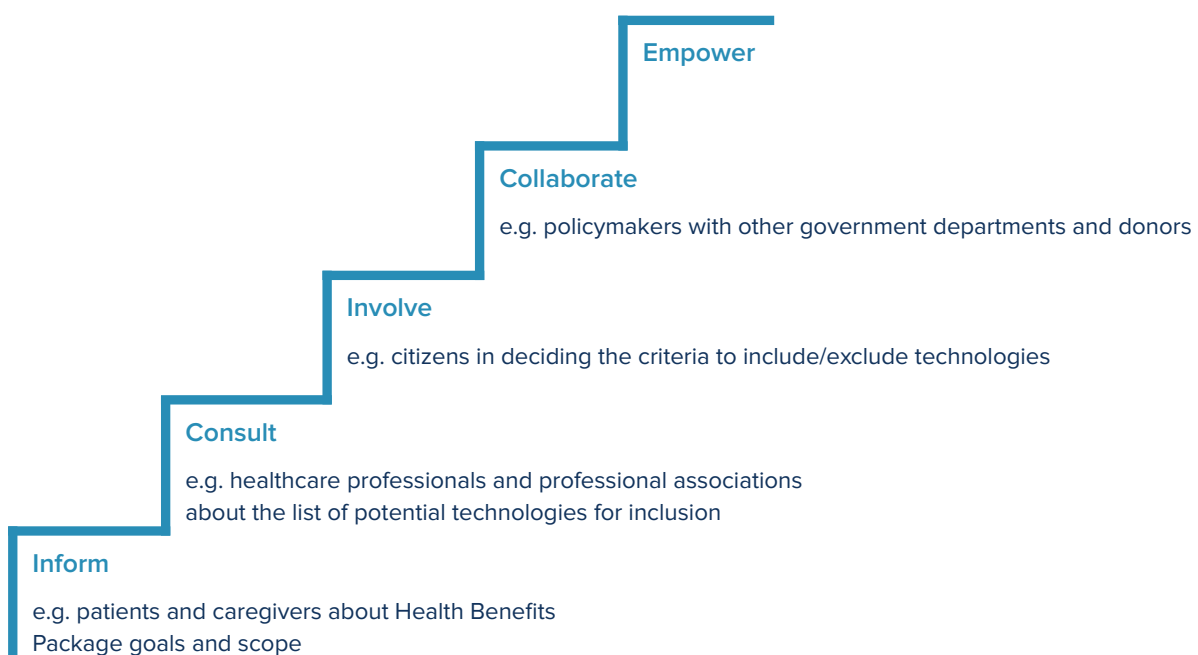
There is no one way to engage with stakeholders. This will depend on the role a specific stakeholder is expected to play in benefit design under NHI. It will also depend on the extent to which there is a need to build a stakeholder's capacity to fulfil that role, and the stage at which their engagement is relevant (e.g. design, methods, content development, updating, identification of priorities, production or commenting on evidence, etc.). Table 2 presents examples of different stakeholders and different capacities required all the way from the individual to the institutional and broader healthcare and policy system levels.¹⁶ Figure 3 presents examples of the different levels of stakeholder participation, which range from 'Informing' at one end of the spectrum to 'Empowering' at the other.¹⁴

One final way to approach stakeholder engagement further is through what is referred to as 'deliberative' processes.¹⁷ Deliberation is not the same as consultation; while there is limited evidence on what best practice is when it comes to deliberation, there is consensus that inclusive, evidence-informed deliberative processes accounting for medical and social science evidence and people's values, are most likely to produce the best guidance for the healthcare system and provide “balanced consensus”.^{17,18} This is an aspiration

Figure 2: National health sector stakeholders to the South African NHI Service Benefits



Figure 3: Examples of levels of stakeholder participation



Source: Glassman et al.; 2017.¹⁴

Table 2: Examples of target stakeholders and capacity needs

Stakeholder group	Capacities required
Environment	
Health system	<ul style="list-style-type: none"> To support the capacities required at the different INNE levels by institutionalising evidence-informed priority-setting agencies at provincial, national and regional levels (as deemed appropriate). This perhaps can be seen as one of the goals for the capacity-building activities. Other activities or interventions at the health system level may help or hinder the development and uptake of evidence.
Networks	
Funders and development partners	<ul style="list-style-type: none"> To commission, receive, interpret and use (as they judge to be appropriate) the methods and outcomes of HTA/priority-setting research to inform decisions about both investment choices in global health and single technology or program choices at a national level, including investments to support effective priority-setting and health system strengthening. To have common understanding, for instance through a common theory of change, of the outcomes, preconditions, and underlying assumptions of investments to support priority-setting and health system strengthening; and to support knowledge translation efforts towards those outcomes.
Nodes (organisations) and individuals	
Consumers of evidence	
Policy and professional decision-makers	<ul style="list-style-type: none"> To commission, receive, interpret and use (as they deem appropriate) the methods and outcomes of HTA and priority-setting research. To disseminate the outcomes of HTA research, and follow-up/monitor impact.
Health service managers	<ul style="list-style-type: none"> To understand implications of competing spending options and to manage resources accordingly. To create and manage local capacity for communications, knowledge translation and setting clinical standards.
Courts and the judiciary	<ul style="list-style-type: none"> To understand the rationale for priority setting, and the tools and processes for evidence-informed priority-setting. To respect and rely on the government's healthcare coverage choices where these have been made through evidence-informed priority-setting mechanisms in a procedurally legitimate manner as set out in law, while maintaining appropriate independence. To hold decision-makers accountable in the priority-setting process, for example through engaging in judicial review.
Patients and the public	<ul style="list-style-type: none"> To understand the implications of policy and clinical decisions, identify the extent to which they are evidence-informed and represent efficient and ethical use of public monies. To understand that unavoidable trade-offs have to be made in priority-setting and the associated ethical implications. To participate in the process of decision-making, recognising the need that decisions have to be made, and highlighting the extent to which they reflect societal values.
Producers of evidence	
Academic institutions, researchers and research managers	<ul style="list-style-type: none"> To understand policy and professional decision-makers' needs. To identify those needs that can be satisfied by HTA research. To conduct and manage the required research without partisan advocacy and to the required standards. To communicate research effectively to meet the needs of decision-makers.
Knowledge brokers	
Knowledge brokers, including priority-setting institutions	<ul style="list-style-type: none"> To understand the cultures of both research and decision-making environments. To assess and communicate research evidence and policy needs. To identify the 'right' stakeholders from both sides and to convene, facilitate and mediate between them such that there is meaningful knowledge transfer between researchers and decision-makers (and between government agencies and local hospitals, professional organisations and community workers, and so on).
Media organisations and journalists	<ul style="list-style-type: none"> To report in an objective and impartial manner stories linked to priority-setting in health and to institutions set up by governments to make such decisions. To encourage public debate in a positive way, and improve policymaking through holding decision-makers accountable to the general public.

Source: Li et al.; 2019.¹⁶

HTA = health technology assessment; INNE = Individual, Node, Network, Environment.

that those driving development of the NHI service benefits as a central feature of the NHI vision ought to pursue while monitoring its effectiveness and cost effectiveness.

Finally, there is a financial cost to stakeholder engagement processes, and money going towards engagement is money not spent on frontline services. Therefore, engagement and participation by different groups must be organised in a way that maximises the impact of their input and minimises the costs. This is a daunting task, but the wide range of independent parties available in South Africa to support the NDoH in this work represents an invaluable resource. Box 1 provides two brief examples of stakeholder engagement in other countries.

Conclusions

This chapter gave an overview of the development of the NHI SBF as an innovative approach to establish a national health benefits package, or what in South Africa is referred to as 'Service Benefits', that is situated at the centre of NHI reform. It provides an explicit list of the conditions and healthcare services to be covered under NHI and provided by public and private sector providers in South Africa, as well as the per patient resources required to deliver those services, as reflected in existing national clinical guidelines and policy. The SBF represents a new and unique contribution to the global UHC movement with consequent potential as a global public good. The chapter reviewed the design and development of the SBF and outlined lessons learnt to date. These include the role of stakeholder

engagement across NDoH directorates; the need to restructure the SBF and provide for common nomenclature and coding systems to support national health sector coordination; and the role of alignment and standardisation in the development and implementation of health policy, guidelines and HMIS. The chapter also highlights the role of the SBF as a tool to support good governance in benefit design.

Finally, a recommendation was made linked to the first lesson, namely that a wider set of national health sector stakeholders be engaged to address fragmentation in understanding the service benefits available across the spheres of Government and current differences in the service benefits available across the public and private sectors. This will be critical to drive incremental alignment, but equally to build trust, establish buy-in, leverage complementary expertise held in the private sector and build a common understanding that will ultimately enable a smoother transition to NHI.

The design and implementation of NHI is a political process as much as a technical one. Therefore, while much of the preparatory technical groundwork is being done, implementation is contingent on progress with the necessary legislative processes to finalise the NHI Bill and establish the NHI Fund. As this progresses, however, stakeholder engagement in the NHI service benefits will be key, including discussion on how existing roles and responsibilities must evolve and capacities be built under NHI to allow for the establishment of a single unified health system that accelerates progress towards UHC in South Africa.

Box 1: International examples of stakeholder engagement

A good international example of stakeholder engagement is the National Institute for Health and Care Excellence (NICE) in the United Kingdom, the National Health Service (NHS) priority-setting body. Public engagement has played a major role and the Institute has had a dedicated budget line since its establishment in 1999.¹⁹ But even in a well-resourced system, engagement can threaten the legitimacy of the process. A recent study found that almost 80% of the financial interests of public and patient organisations actively contributing to NICE guidance were not known to NICE decision-making committees.²⁰ Amid increasing pressure on the NHS to do more with less, NICE seems to have backed away from its longstanding commitment to explicitly acknowledging societal values in its decision-making process.^{21,22}

This is a cautionary tale for a country with fewer resources and a deeply rooted sense of solidarity and commitment to equity as to how best to design and sustainably finance stakeholder engagement processes.

Another example is the Health Intervention and Technology Assessment Programme (HITAP) in Thailand, responsible for informing updates in the country's Essential Medicines List and the service benefits set by the National Health Security Office. The HITAP is highly participatory: it is involved in selecting interventions and technologies for assessment, through to final decisions, and beyond that to communicating decisions and running awareness-raising and capacity-building events for stakeholders.²³

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Measuring National Health Insurance: towards Universal Health Coverage in South Africa

Authors

Thulile Zondiⁱ
Candy Dayⁱⁱ

Quantification of UHC trends in South Africa suggests that significant progress was made overall between 1998 and 2019 in terms of increasing population coverage for most categories of health services. Inequity between groups has declined. However, improvement in service quality to provide effective coverage has been slow.

Universal Health Coverage (UHC) is concerned with removing finance as a barrier to healthcare access; it is also concerned with reducing poverty through ensuring that the vulnerable are not pushed more deeply into poverty after paying for health services.

South Africa is pursuing UHC through the implementation of National Health Insurance (NHI). NHI is defined as a health-financing system that pools funds to provide access to quality health services for all South Africans, based on their health needs and irrespective of their socio-economic status.

South Africa is currently in the second year of Phase 2 NHI implementation (2018 - 2022), which focuses on development of NHI legislation, a functional NHI Fund and its structures, and purchasing of personal healthcare services for vulnerable groups. The NHI Phase 1 Evaluation (2019) concluded that there were both successes and challenges, and lessons learnt were identified.

This chapter analyses UHC coverage trends, and identifies information gaps and implications for the future in South Africa.

According to the World Health Organization analytic framework, quantification of UHC trends in South Africa suggests that significant progress was made overall between 1998 and 2019 in terms of increasing population coverage for most categories of health services. In general, inequity between groups has declined. However, improvement in service quality to provide effective coverage (where it is possible to measure this) has been slow. It will be imperative to focus on outcomes at all levels of treatment cascades to ensure effective UHC in the future.

i South African National Department of Health
ii Health Systems Trust

Introduction

South Africa is pursuing Universal Health Coverage (UHC) through the implementation of National Health Insurance (NHI).^{1,2} NHI is defined as a health-financing system that pools funds to provide access to quality health services for all South Africans, based on their health needs and irrespective of their socio-economic status.³

The World Health Organization (WHO) defined UHC as “access to key promotive, preventive, curative and rehabilitative health interventions for all at an affordable cost, thereby achieving equity in access”.⁴ UHC is concerned with removing finance as a barrier to healthcare access; it is also concerned with reducing poverty through ensuring that the vulnerable are not pushed more deeply into poverty after paying for health services.

Access to health care is a fundamental human right, as enshrined in Chapter 2 of the Constitution (Act No. 108 of 1996) of the Republic of South Africa, which stipulates that “everyone has the right to have access to health care services, including reproductive health care”. Section 27(2) of the Constitution requires that “the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights”.⁵

South Africa is a signatory to the United Nations Sustainable Development Goals (SDGs) for 2030, and will be monitored and compared with other countries on progress made.⁶ Target 3.8 (within SDG 3 on health) aims to achieve UHC, including financial risk protection, access to quality essential healthcare services, and access to safe, effective, quality and affordable essential medicines and vaccines for all.

Measurement of UHC needs careful consideration since it includes several effective service-delivery coverage-tracer indicators, with data availability and quality varying globally as well as sub-nationally.⁷ The purpose of this chapter is to highlight progress made in the implementation of NHI towards UHC, identify current information gaps and the implications of these gaps for measurement of NHI in South Africa.

NHI implementation in context

Post 1994, the democratic government inherited a fragmented, inequitable, racially segregated, predominantly curative, and hospital-centric health system, with a quadruple burden of disease.⁸ Good progress has been made over the years on certain health status outcomes, such as life expectancy, and certain mortality rates have dropped. However, the high burden of disease, the persistent challenge of poor service quality, overstretched resources in the public sector, and rising costs of private healthcare services, medicines and

commodities, all compromise the NHI goal of increasing access to health care, especially among vulnerable populations.⁹⁻¹¹

NHI needs to deal with the escalating cost of health services and medicines. South Africa currently spends about 8.9% of Gross Domestic Product (GDP) inequitably between public and private health.¹² Public health expenditure is just under 50% of total health expenditure, for 82.6% of the population. Studies have shown higher overall utilisation among members of medical schemes and wealthier groups, as well as differences across rural and urban areas and between provinces.^{11,13,14} NHI implementation is expected to transform the service platform through ensuring access to both public- and private-sector facilities, a comprehensive package of care to citizens, NHI fund prepayment and purchasing of services for citizens, and elimination of out-of-pocket payments.³

The 2019 Competition Commission Health Market Inquiry (HMI) found that the South African market is still characterised by high and rising costs of health care and medical scheme cover, rising out-of-pocket payments, ineffective controls on increasing volumes of care, and poor regulation of the private sector. It also found that there are no measures to report on quality and health outcomes in the private practitioner markets, which is a great challenge given the perceived superiority of private health care.¹¹

Progress on NHI implementation

NHI implementation phases

Measurement of NHI will align with the planned incremental approach to implementation and service delivery coverage. The NHI phases are:³

- **Phase 1 (2012 - 2017)** focused on piloting various health-systems strengthening (HSS) interventions in preparation for the full implementation of NHI.
- **Current Phase 2 (2018 - 2022)** is focused on the development of NHI legislation and amendments to existing legislation, as well as a fully functional NHI Fund and its structures. It also involves purchasing personal healthcare services for vulnerable groups.
- **Phase 3 (2023 - 2026)** will focus on HSS activities to be implemented to full scale, and mobilisation of additional resources. Mandatory payment for NHI through NHI-specific taxes and contracting of accredited service providers will be implemented.

Policy development

It is envisaged that there will be substantive policy and legislative reform for NHI, including the National Health Act and regulation of the private sector, among others.¹⁵ The Green Paper on NHI¹⁶ was published in 2011, followed by the White Paper on NHI on 11 December 2015.³ The final White Paper on NHI Policy¹⁷ was published on

30 June 2017 following approval by Cabinet. The latter aimed to provide a policy framework for transforming the manner in which healthcare services are financed and purchased, as well as how these services are provided in both the public and private health sectors.

The NHI Bill and Medical Schemes Amendment Bill were tabled before Cabinet, and subsequently published on 21 June 2018.^{18,19} The NHI Bill was released in July 2019 for public comment; the Bill seeks to establish the NHI Fund, its powers, functions and governance structures, and makes provision for mandatory prepayment for healthcare services in South Africa. The Medical Schemes Amendment Bill seeks to amend the Medical Schemes Act (No. 131 of 1998),¹⁹ to improve regulation of the medical schemes industry, and to ensure that beneficiaries are better protected, promoting better access to private health funding.

The proposed NHI legislation and policy changes form a highly contested terrain among various groups in the country, and extensive consultations will be necessary.

Piloting NHI

The following 10 priority innovative HSS interventions were implemented in the selected 11 NHI pilot districts during the first phase from 2012 - 2017.²⁰

1. Ward-Based Primary Healthcare Outreach Teams (WBPHCOTS), to provide promotive and preventive health care to households.
2. The Integrated School Health Programme (ISHP), to provide health promotion and preventive services to school-going children.
3. Contracting of General Practitioners (GPs) at primary health care (PHC) facilities, to improve quality of care.
4. The Ideal Clinic Realisation and Maintenance Model (ICRM), to increase quality of services through the establishment of minimum standards.
5. District Clinical Specialist Teams (DCSTs), to support clinical governance, clinical work, research and training.
6. Centralised Chronic Medicine Dispensing and Distribution (CCMDD), to provide chronic medication at designated pick-up points closer to communities.
7. The Health Patient Registration System (HPRS), to provide electronic patient registration in preparation for an electronic patient record.
8. The Stock Visibility System (SVS), to improve oversight of stock through an electronic stock-monitoring system, thereby reducing stockouts by facilitating appropriate and timely ordering.
9. Infrastructure projects, to improve access and quality of care.
10. Workload Indicator for Staffing Needs (WISN), a WHO planning tool for facility staff management.

NHI phase 1 evaluation

External evaluation was undertaken between November 2017 and December 2018, and aimed to evaluate progress and document successes, challenges and lessons learnt.²¹

The evaluation assessed individual intervention coverage and gauged the barriers and enhancers of health system performance.

The evaluation concluded that there were both successes and challenges during phase 1 of NHI implementation, and that lessons learnt should be used to strengthen interventions in phase 2. The main successes were increased coverage of new intervention services, such as 4 339 875 learners screened through the ISHP, and 504 803 of these referred for treatment; 330 GPs contracted to provide care in the public sector; 3 519 WBPHCOTS established, covering 12 816 152 households; 2 182 422 patients enrolled for CCMDD and collecting medicines at over 855 pick-up points; SVS implemented in 3 167 clinics and community health centres; and 20 700 149 people registered on the HPRS in 2 968 PHC facilities. The evaluation found that the success of interventions was driven by strong political will and adequate human and financial resources for implementation, and that strong champions holding the vision at all levels ensured robust implementation, good coordination and communication, and good monitoring systems in place at the time of implementation.

The challenges experienced included inadequate planning, lack of resources, inconsistent communication, silo implementation and lack of coordination, inadequate budgets, and a bureaucratic organisational culture unsupportive of problem solving and innovation.

The overall recommendations fundamental to measuring NHI going forward include a shared common vision for NHI explicitly articulated in a plan, better stakeholder communication, a well-defined results matrix, and strong monitoring and evaluation followed through with corrective action.

The main limitation with this evaluation was that it could only demonstrate short-term improvement in service coverage; more time is required to be able to demonstrate impact.

Measuring UHC

The WHO established the framework for the UHC service coverage index in order to measure progress towards target 3.8.1 of SDG 3.^{22,23} Although countries provide a wide range of services, it is not practical to monitor indicators for all these services, either at a global level, or

at sub-national levels within countries. Tracer indicators were therefore selected to capture the breadth of health services in a measurable way, grouped into four categories, according to documented criteria.²⁴ The index is calculated as the (unweighted) geometric means of the available indicators, firstly within each category and then across the four categories. The index was conceived in such a way as to be transparent, and computationally simple and easy for countries to adopt and adapt to local circumstances and data availability, with key measurement concepts to guide these adaptations.^{24,25}

- Indicators should cover the main health areas of health and disease burden (reproductive, maternal, newborn and child health (RMNCH); infectious diseases; non-communicable diseases (NCDs); and injuries).
- The index should include indicators spanning the types of services such as prevention, treatment, rehabilitation and palliation.
- Effective service coverage, defined as the proportion of people in need of services who receive services of sufficient quality to obtain potential health gains, is the preferred metric for the service coverage dimension. For example, antiretroviral therapy (ART) coverage is a measure of service coverage, whereas viral load suppression captures whether the treatment provided is effective. Quality of health services is critical to achieving improved health outcomes, yet has been much harder to achieve than scaling up coverage.²⁶⁻²⁸
- The index should be disaggregated by key inequality dimensions, and some authors have incorporated measures of inequality into the index construction.²⁹

In order to address major measurement gaps in the Framework, proxy indicators are used, correlated with the provision of services. The category on service capacity and access (including bed density, health worker density and access to medicines) represents the general availability or rate of use of services without providing information on the proportion of people in need of a particular service who actually receive it. These indicators are therefore difficult to interpret because optimum levels are unknown; in the index they are rescaled against a maximum threshold. UHC indicators are intended to reflect actual services received, rather than an entitlement to services,²⁹ a distinction that may be difficult to distinguish with service capacity indicators, and an issue particularly relevant to South Africa where the entire population will be entitled to free access to a basket of healthcare services, while in practice significant barriers to quality healthcare access remain, as reflected in the poor health outcomes.

Alternative UHC indexes have been constructed that use a different selection of indicators, different statistical methods to combine the components into a composite index, and a different principle for framing the component or variations to accommodate data availability or relevance in a country context.³⁰⁻³³ The WHO is also spearheading work to strengthen the use of health facility data and other routine sources in measurement of UHC to address some of the limitations of traditional population-based surveys.³³ These

methodological considerations are beyond the scope of this chapter but should be considered as South Africa seeks further adaptation of the UHC index.

The UHC service coverage index in South Africa

The NHI White Paper outlines how NHI will be configured along the three dimensions described by the WHO for progressing towards UHC, namely population coverage, service coverage, and cost coverage:³⁴

1. Population coverage refers to the proportion of the population that has access to needed health services. NHI will determine comprehensive healthcare service packages of care for various age groups, including vulnerable groups.
2. Service coverage refers to the extent to which there is coverage for a range of quality health services necessary to address the health needs of the population. NHI will cover comprehensive healthcare services.
3. Cost coverage refers to the extent to which the population is protected from direct costs as well as from catastrophic health expenditure. For NHI, financial risk protection will be achieved by increasing government expenditure on health, reducing out-of-pocket payments, and supporting mechanisms for the poor.

Hogan et al. reported the 2015 baseline results based on the service coverage dimensions of the index for 183 countries (including South Africa) in 2018.²⁵ These results were updated by the WHO in 2019,² and Day et al. presented a national and provincial-level update for this index using the most updated and applicable nationally available data sources in 2018.³⁵

This first country effort to calculate the index produced a very similar result of 66.2 (on the scale of 0 - 100), where Hogan et al.²⁵ reported a score of 67. This was understandable since the South African Demographic and Health Survey (SADHS)¹³ was a common data source for several indicators in both calculations, and other indicators varied, but in opposite directions. The index showed relatively strong performance on RMNCH metrics (score of 85.4 nationally) and reasonable performance on capacity and access measures (69.9), but scores below 60 in the domains of infectious diseases and NCDs. Provincial variation in the overall index score ranged from 63.4 in Limpopo to 70.4 in the Western Cape. The real extent of variation may be somewhat masked by the choice of measures, as in the case of four indicators only a single national value was available.

In 2019, a thorough revision of the country UHC index was undertaken to consider trends over time, review alternative data sources, and choose the most suitable tracer indicators for sub-national time series analysis, as well as to incorporate the use of routine health facility data sources. The methodological

considerations and indicator definitions are described elsewhere in this Review and in global metadata reports.^{36,37} Based on the availability of suitable data (with equity stratifiers) between 1998 and 2019, a basket of 15 of the 16 indicators (omitting tracer 7 on malaria prevention) were selected for calculating the national index. The latest or closest data point for each time period was used. Timing of key household surveys was the main determinant in choosing the time periods.

Results

Available data for index and proxy indicators were collated from 1998 to 2019 (Table 1). Although somewhat infrequent, household surveys provide the longest time series for selected tracer indicators that align closely with the globally defined index. The index was thus calculated for five time periods between 1998 and 2018 (Table 2).

Using a combination of survey and routine data sources, South Africa has a reasonably comprehensive set of data available compared with other countries. The overall UHC service coverage index increased steadily from 24.3 in 1998 - 2002 (based on 10/16 indicators) to 61.8 in 2016 - 2018 (based on 15/16 indicators). The latest estimate of 61.8 is 4.4 units lower than the previous estimate of 66.2, mostly due to different

rescaling methods and indicators in the capacity category of the index. Revised calculation of the composite health worker density based on scaling medical practitioners, professional nurses and pharmacists per uninsured population against thresholds of 30, 100 and 5 per 10 000, resulted in a coverage score of 14.9, less than half that estimated using only medical professionals and the threshold suggested by Hogan of 9 per 10 000. The tracer medicine stock-out rate recorded in the District Health Information Software (DHIS) increased, with a concomitant decline in the inverse (which is the proportion of health facilities with essential medicines). Finally, in place of the International Health Regulations core capacity index (91), the Environmental Health Services compliance rate was reported as 62 in 2018/19. These results do not, therefore, suggest a decline in performance towards UHC since last year; trends should be assessed using comparable metrics over time as far as possible.

For the national index constructed here (Table 1), it is apparent that the best service coverage is in the RMNCH category, although service coverage has remained fairly consistent over the 20-year period, with the main increase in the pneumonia case fatality under 5 years index (rescaled according to the maximum observed value). In the infectious disease category, the roll out of ART was the main contributor to progress, while the broad socio-economic determinant of access to safe sanitation has increased steadily. Tuberculosis (TB) effective treatment coverage has stagnated. The relative paucity of

Table 1: Available index and proxy indicators for the UHC index, South Africa, 1998 - 2019

Indicator	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Note		
Reproductive, maternal, newborn and child health	1 Demand for family planning satisfied with modern methods	79.0				81.3												75.7				1		
	Couple year protection rate (index)		25.3	23.4	24.3	24.4	26.0	27.1	29.9	30.1	31.3	32.5	33.5	34.7	41.6	49.3	63.0	66.6	70.1	59.2	61.0		2	
	2 Births attended by skilled health personnel	84.4				91.2					94.3												3	
	Antenatal 1st visit coverage before 20 weeks (index)			23.3	26.3	25.7	27.1	28.7	28.4	26.9	29.2	28.6	30.4	32.1	32.0	41.7	45.0	45.8	48.8	51.4	55.0		4	
	Antenatal 1st visit coverage (index)			76.5	85.7	87.7	93.1	94.0	91.7	87.4	89.7	83.4	81.0	81.6	78.0	83.3	83.6	74.8	74.9	77.2	80.8		5	
	Delivery in facility rate (index)		54.7	65.3	68.1	68.0	74.2	74.5	74.6	73.0	73.8	71.7	71.2	74.1	75.9	76.8	79.2	74.1	72.4	75.7	78.1		6	
	3 DTP3 coverage					67.0					62.6											65.0	7	
			75.0	73.0	71.0	70.0	69.0	74.0	81.0	84.0	85.0	82.0	81.0	77.0	75.0	71.0	81.0	85.0	85.0	76.0	76.0	74.0	8	
		Immunisation under 1 year coverage (index)		71.4	67.0	70.8	71.0	70.3	75.7	76.6	73.4	74.8	77.0	71.1	76.9	78.0	78.1	82.9	79.4	70.9	76.9	81.9	9	
	4 Pneumonia case fatality under 5 years rate (rescaled)							82.4	83.6	82.8	83.0	87.0	88.6	91.8	92.4	93.0	94.2	95.4	96.0	95.2	96.2		10	
								69.3	72.1	74.8	77.3	79.7	81.9	84.0	85.9	87.8	89.5	91.1	92.7	94.1	95.5		11	
		Percentage of children under 5 years of age with suspected pneumonia taken to a health facility																	87.6				12	
	5 Tuberculosis effective treatment coverage								44.8	44.7	50.6	52.8	51.7	56.6	51.8	53.0	52.5	55.1	55.6	51.9			13	
	6 Infectious diseases	Antiretroviral effective coverage (PLHIV on ART and virally suppressed)																			31.9	40.6	42.5	14
																					47.0			15
			0.1	0.3	0.4	0.7	1.6	3.0	5.2	7.9	11.1	15.2	20.2	24.8	29.2	32.8	36.2	40.9	46.9	53.4	59.2		16	
Antiretroviral coverage (2nd 90)									28.0		37.0	55.0	17.9					51.0					17	
			0.2	0.4	0.5	1.0	2.1	3.8	6.6	10.0	14.4	20.1	27.5	34.4	40.9	45.8	49.4	53.3	57.7	61.9	65.3		18	
8 Percentage of households with access to improved sanitation		58.5							64.4				68.9					75.6				20		
				61.7		65.9		68.3		70.0		75.4		77.0		79.5	79.9	81.0	82.4	83.0		21		

Indicator	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Note	
Non-communicable diseases	9 Prevalence of nonraised blood pressure									73.2		73.2		73.3			78.5		78.8			22	
																		62.8					23
	Prevalence of nonraised blood pressure age-standardised (rescaled)										47.7		47.9		49.2			59.0		60.2			24
	Hypertension effective treatment coverage (% hypertensives controlled)														9.1				16.4				25
											35.0		33.2		38.0			46.7		44.7			26
	Hypertension treatment coverage														27.5				41.3				27
10 Percentage of people with diabetes receiving treatment										44.4	43.4	42.4	41.4	40.5	39.5	38.6	37.7	36.7	35.8			28	
														37.5								29	
														19.4								30	
Mean fasting plasma glucose rescaled (index)		75.0								70.0								69.5				31	
11 Cervical cancer screening effective coverage					23.2																	32	
																		37.2				33	
		3.6	6.5	9.4	10.5	13.6	19.8	30.0	34.1	43.2	45.0	49.7	52.2	52.0	55.9	56.7	58.3	63.6	60.8	65.1		34	
12 Tobacco non-smoking prevalence		76.0			77.35					79.1		82.2		80.5			79.6		80.7			35	
														83.8				77.5				36	
13 Hospital beds per 10 000 target population (index)				100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99.5	37
																	3.6	9.2	29.8	43.5	55.3		38
14 Health worker density (index)		8.1	7.9	7.5	7.5		8.5	8.9	9.2	9.7	9.8	11.8	13.0	13.4	14.4	14.7	15.0	14.6	14.8	14.9	15.3	39	
																		61.0	60.6	61.0	61.3	40	
		24.3	22.0	21.1	21.7		24.0	25.7	26.8	28.9	29.5	30.4	32.2	32.2	34.8	34.3	33.7	33.4	33.9	33.6	35.6	41	
15 Proportion of health facilities with essential medicines		95.3	82.6	83.6	85.4	84.6	76.9	68.3	63.8	53.7	46.4	90.8	89.7	84.7	73.2	76.0	77.2	81.9	74.6	62.6		42	
16 Environmental health services compliance rate																		43.1	63.0	62.3		43	
																			91.0	66.0		44	
17 Universal health coverage: service coverage index		29.2					30.8					37.4						43.9	45.0	46.1	47.2	45	
																	67.0		69.1			46	
Count of data points	4	9	13	14	18	12	15	17	18	25	18	24	18	27	17	19	24	32	29	21	7		



Notes (Series, Age, Sex, Category, Reference)

- SADHS, 15-49 years, female, married or sexually active. SADHS reports.
- DHIS, both sexes. DHIS.
- SABSSM and SADHS, doctor or nurse/midwife. HIV Children 2008, SADHS reports.
- DHIS, female. DHIS.
- DHIS, female. DHIS.
- DHIS, female. DHIS.
- SABSSM and SADHS, both sexes. HIV Children 2008, SADHS reports.
- WHO/UNICEF, both sexes. Immunisation. 2019.
- DHIS, both sexes. DHIS.
- DHIS, <5 years, both sexes. DHIS.
- Smoothed, <5 years, both sexes. DHIS.
- SADHS, <5 years, both sexes. SADHS 2016 Full Report.
- ETR, both sexes. Electronic TB Register.
- DHIS-Tier, all ages, both sexes. DHIS.
- Global Report, all ages, both sexes. UNAIDS data, 2018.
- THEMBISA 4.2, all ages, both sexes. ThemBisa v4.2.
- GBD, all ages, both sexes. GBD 2015 HIV, GBD 2017 HIV.
- Global Report, all ages, both sexes. UNAIDS data 2018, Universal Access 2008, 2010, 2011.
- THEMBISA 4.2, all ages, both sexes. ThemBisa v4.2.
- Census and CS. Census 2001, 2011. Community Survey 2007, 2016 Provincial.
- GHS 2018, Stats SA GHS 2018.
- NiDS, 15+ years, both sexes. NiDS Wave 1-5 (latest).
- SADHS, 15+ years, both sexes. SADHS 2016 Full Report.
- NiDS, 15+ years, both sexes. NiDS Wave 1-5 (latest).
- SANHANES, SADHS, 15+ years, both sexes. Geldsetzer et al. 2019, SADHS 2016 Full Report.
- NiDS modelled, 15+ years, both sexes. NiDS Diabetes model.
- SANHANES, 15+ years, both sexes, age-standardised. Stokes et al. 2017.
- SANHANES, 15+ years, both sexes, age-standardised. Stokes et al. 2017.
- 25+ years, both sexes. Danaei et al. 2011b, Hogan et al. 2018.
- PLoS Med 2008 17;5(6).
- SADHS, 15+ years, female. SADHS 2016 Full Report.
- DHIS, 30+ years, female. DHIS.
- NiDS, 15+ years, both sexes. NiDS Wave 1-5 (latest).
- SADHS and SANHANES, 15+ years, both sexes. SANHANES, SADHS reports.
- DHIS, public sector. DHIS.
- Ideal Clinic System.
- Public sector, both sexes. PERSAL.
- Total, both sexes. GBD 2016 SDGs.
- Public sector, both sexes. PERSAL.
- DHIS.
- NDoH.
- WHO. World Health Statistics 2018, 2019.
- GBD 2016. Scaled. GBD 2016 SDGs.
- WHO. World Health Statistics 2019, UHC Global Monitoring 2019.

services and information systems for NCDs is evident in the construction of the NCD category of the index. Analysis of the treatment cascades for hypertension and diabetes show poor treatment coverage and control of these highly prevalent conditions. Screening for cervical cancer has increased steadily, reflecting improvement in one aspect of cancer prevention. Within the capacity category, the threshold for hospital bed density suggests adequate coverage at national level for the entire period; however, health worker density is extremely low overall, when considering those working in the public sector per uninsured population.

Equity

It is not possible to calculate the overall index using any of the equity stratifiers (wealth quintile, race, sex, education level) since none of these are collected across all indicators, or they simply do not make sense for capacity measures of the health system. This section therefore presents equity results for selected component indicators only.

The most dramatic finding is the reduction in inequity by socio-economic quintile (SEQ) between 1998 and 2016 (Figure 1). Satisfied demand for family planning ranged from 55.7 (poorest

quintile) to 90.6 (wealthiest quintile) in 1998, but converged to around 78% for both quintiles in 2016. Similar trends were observed for skilled birth attendance. The different proxies for prevention of cardiovascular disease (CVD) give varied results by SEQ; the lowest prevalence of non-raised blood pressure (BP) is seen in the wealthiest quintile (males), despite hypertension effective treatment coverage being about double in the wealthiest quintile compared with the poorest. Diabetes is significantly concentrated among the rich, and Mutyambizi et al. reported that undiagnosed diabetes was pro-poor, although assessment of effective treatment coverage by wealth quintile was not published.³⁸ Cervical cancer screening still appears to be substantially higher in the wealthiest quintile (59.1% v. 22.4%). As expected, cervical cancer screening is higher in HIV-positive women, and in those with medical insurance (Figure 2) and in urban locations (Figure 3). The gap in service coverage for urban and non-urban areas has narrowed.

Immunisation coverage is similar for male and female infants, but for HIV and hypertension, treatment coverage is higher for females in most age groups. Diabetes prevalence is slightly higher in females than males, and non-smoking prevalence is substantially better in females (Figure 4).

Table 2: Trends in UHC service coverage index for South Africa, 1998 - 2018

	Tracer	Indicator	1998-2002	2003-2007	2008-2011	2012-2015	2016-2018	Source
RMNCH	1	Demand for family planning satisfied with modern methods	79.0	81.3	81.3	81.3	75.7	SADHS
	2	Births attended by skilled health personnel	84.4	91.2	94.3	94.3	96.7	SABSSM & SADHS
	3	Immunisation under 1 year coverage (index)	70.8	73.4	76.9	79.4	81.9	DHIS
	4	Pneumonia case fatality under 5 years rate (rescaled)		74.8	84.0	91.1	95.5	DHIS smoothed
Infectious diseases	5	Tuberculosis effective treatment coverage		44.7	56.6	55.1	51.9	ETR
	6	Antiretroviral effective coverage (PLHIV on ART and virally suppressed)	0.3	5.2	20.2	36.2	53.4	Thembisa
	7	Percentage of population sleeping under insecticide-treated nets	ND	ND	ND	ND	ND	No data
	8	Percentage of households with access to improved sanitation	58.5	64.4	68.9	75.6	75.6	Census & CS
NCDs	9	Prevalence of nonraised blood pressure age-standardised (rescaled)		47.7	47.9	59.0	60.2	NiDS, age-std, rescaled
	10	Percentage of people with diabetes receiving treatment		44.4	41.4	37.7	35.8	NiDS modelled
	11	Cervical cancer screening coverage (index)	9.4	34.1	52.2	58.3	65.1	DHIS
	12	Tobacco non-smoking prevalence	76.0	77.4	83.8	83.8	77.5	SADHS & SANHANES
Service capacity and access	13	Hospital beds per 10 000 target population (index)	100.0	100.0	100.0	100.0	100.0	DHIS
	14	Health worker density (index)	7.5	9.2	13.0	15.0	14.9	PERSAL
	15	Proportion of health facilities with essential medicines	83.6	63.8	84.7	77.2	62.6	DHIS
	16	Environmental health services compliance rate				43.1	63.0	NDoH
		RMNCH	77.9	79.9	83.9	86.3	87.0	
		Infectious	4.2	24.6	42.9	53.2	59.4	
		NCDs	26.7	48.6	54.3	57.4	57.4	
		Capacity	39.7	38.8	48.0	47.2	49.2	
		UHC Index	24.3	43.9	55.3	59.4	61.8	

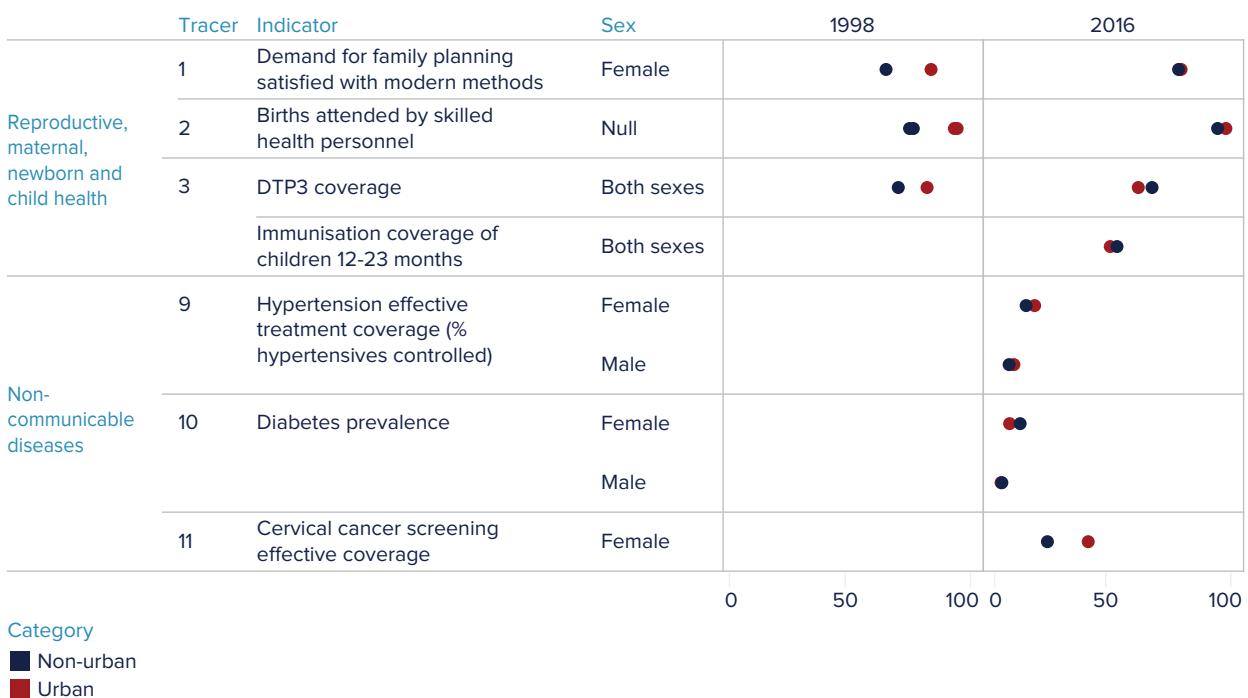
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Implications for future measurement

Some gaps and implications for future measurement that can be drawn from this work include:

- The global index is heavily dependent on survey data sources such as the Demographic and Health Surveys. These cannot be disaggregated below provincial level to enable progress assessment of the district health system, and they are conducted infrequently. The National Income Dynamics Study (NiDS) has filled some of these gaps, with five waves between 2008 and 2017, but as a broad household survey, it has limited health biomarkers. It has been noted that the country has multiple surveys collecting overlapping elements of interest that are not optimally harmonised or are not conducted at the necessary disaggregation or frequency.^{39,40}
- No sub-national information is available for the TB case detection rate, which is used to adjust the treatment success rate for the 'missing patients' who are never diagnosed and started on treatment.^{41,42}
- Diabetes biomarkers have not been collected as widely as biomarkers for hypertension status, and to our knowledge only the South African National Health and Nutrition Examination Survey (SANHANES) has published estimates of effective treatment coverage at national level, despite 'strikingly high levels of unmet need across several key indicators of diabetes diagnosis and care'.^{43,44} A machine learning model was used to estimate the percentage of people with diabetes receiving treatment in order to leverage available data across multiple sources; these techniques are being used increasingly to address data gaps and should be evaluated more comprehensively and systematically to enable the country to monitor progress for hard-to-measure health services at a sub-national level.
- In some cases, South Africa has data available for the preferred effective coverage indicators (which incorporate a measure of quality of service); these are not available in enough countries for inclusion in the global index, for example ART effective coverage (including viral suppression). Generally, these more stringent indicators will result in a lower estimate for the index and divergence between the global and country-generated estimates.
- The International Health Regulations (IHR) core capacity index is a global metric only available at national level. The environmental health services compliance rate has been developed as a sub-national audit of compliance with these regulations and is a proxy available for the country-developed index.⁴⁵

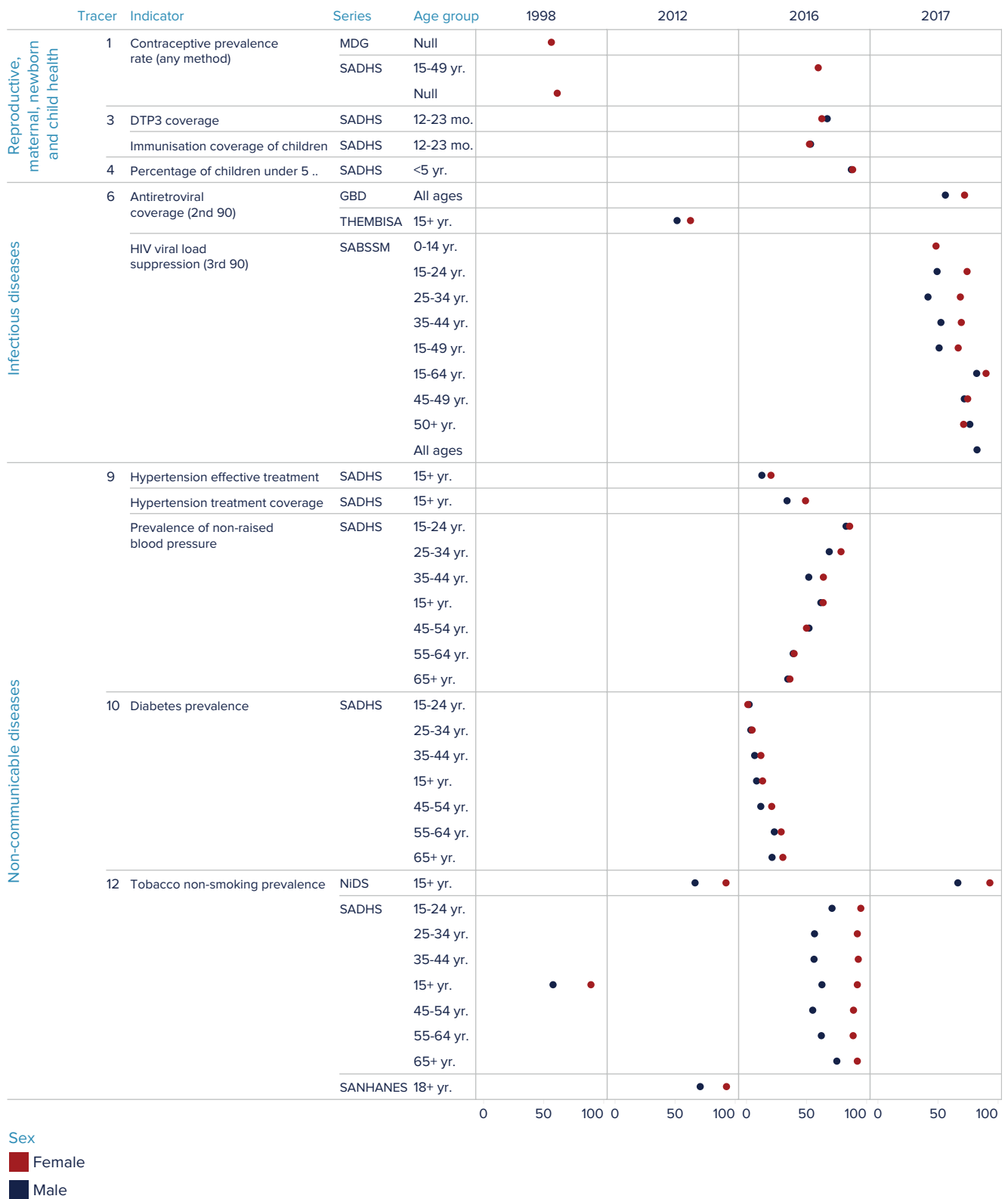
Figure 3: Selected UHC indicators by urban/rural location, 1998 and 2016



Source: SADHS

Note: Diabetes prevalence and cervical cancer screening were not reported in the 1998 DHS.

Figure 4: Selected UHC indicators by sex



- The WHO supports country use of health facility data and is developing guidance documents.³³ The UHC index presented here made use of data from the DHIS for immunisation coverage, pneumonia care, cervical cancer screening, hospital bed density and access to medicines. There are many advantages to using routine data, including the regular availability of a consistent time series that can be disaggregated geographically. Numerous caveats are also generally applicable, and other caveats specific to the individual indicator of interest. Most importantly, facility-based indicators only represent the subset of the population who have sought health care in a facility, and the private sector is still largely omitted from this channel of reporting. Data-quality challenges are numerous and estimation of accurate and valid denominators of the population in need of services based on time-series population estimates is an ongoing challenge. Immunisation coverage is a common example of how the methodological and quality challenges of both survey and routine data sources lead to divergent estimates.⁴⁶
- The use of routine data to measure capacity indicators is also challenging due to the separate public and private sectors and the lack of consolidated and consistently classified information.⁴⁷ The personnel administration system (PERSAL) does not enable identification of specialist categories as required for the UHC index, therefore only the density of medical practitioners was included, and psychiatrist and surgeon density were omitted in the WHO formulation of the health worker density indicator. Although the General Household Surveys⁴⁸ indicate that there is use of the public sector by insured patients and vice versa, the uninsured population was used as the best approximation for the denominator.³⁵ This approach will be even more important when extending the UHC index to sub-national levels, since medical scheme coverage varies widely at district level.
- Availability of equity stratifiers is based primarily on the type of data source, with none being available or meaningful across all the component indicators. Inequities may therefore need to be considered per indicator, or by applying an inequality adjustment.²⁹ More work is required to apply this concept to metrics not derived from household surveys, such as use of an index of multiple deprivation by small areas, as demonstrated in the *District Health Barometer*.⁴⁹
- Very limited assessment of the UHC financial risk-protection measures has been published for South Africa,⁵⁰ and the Income and Expenditure survey data source is infrequent and provides limited disaggregation. Work is needed to develop regular, meaningful measures at sub-national level before this can be included in the overall UHC index.

Quality

Quality is a cross-cutting imperative within the UHC service coverage index, embedded wherever possible in the use of effective coverage indicators. Kruk et al. noted that “poor quality was a larger driver of mortality than non-utilisation of services in 14 of 17 geographic regions and 115 of 137 countries”.²⁷ This is particularly relevant to South Africa, where health outcomes are widely acknowledged to be lower than expected based on socio-demographic status, levels of input, and generally high coverage of health services.^{10,30,51}

The Ideal Clinic framework provides a set of standards for PHC facilities to deliver good-quality health services. Structured assessment linked to programmes for improvement and maintenance represent a major initiative from 2013 to address quality systematically across the health system, focusing initially on PHC.^{52,53} The percentage of ideal clinics, a summary indicator of achievement across multiple components of infrastructure, resourcing and processes, may be an appropriate indicator to include in the capacity category of the UHC index.

Recommendations

- Balance the imperative for a stable baseline and consistent, regular time series with the need to harmonise country assessments with updates in global thinking, advances in technical methods, and availability of new indicators that are useful for inclusion in the index.
- Continue to consult with stakeholders within government and in other sectors to further refine methodological choices, information systems to collect the required data, and analytical techniques to address any limitations in measurement. Key issues requiring development are to:
 - Align the National Indicator Data Set (NIDS) with the requirements for reporting on the SDGs, as well as other national and global reporting commitments.
 - Attempt to collect data elements or variables at small area levels to facilitate sub-national assessment and enable targeting of interventions.
 - Provide leadership and guidance around the harmonisation of surveys so that current duplication and deficiencies can be reduced. Surveys need to be conducted regularly, preferably to district level, and quality data need to be collected, for example on key biomarkers for high burden conditions and financial risk.
 - Continue to expand and develop routine information systems (health facility data, financing, human resources, medicine supply, and electronic patient records) to include all service providers and both the public and private sectors, and improve quality and relevance. Publishing the innovations and challenges in information-systems development should be encouraged to inform global initiatives, and to guide analysis and use of health facility data.³³

- Facilitate the linkage between disparate information systems (such as for human resources for health (HRH)) to enable a holistic view of the actual health worker density by occupation and speciality.
 - Attempt to generate a population view of performance by aligning reporting requirements across the public and private sectors and addressing any other 'missing' population measurements.
 - Develop analytic techniques to capture quality metrics and adjust for measurement limitations, including techniques to combine survey and routine data, regression methods to fill in gaps, and proxy measures where direct measurement is not available.
 - Strengthen systems for patient-level data, including patient registrations and ability to code the reasons for healthcare engagements (Diagnostic Related Groups) to measure outcomes more accurately and comprehensively.
- Consider alternative health priorities for inclusion in the UHC index, for example to replace the malaria tracer indicator.
 - Assess which vulnerable groups or equity dimensions are applicable to each aspect of health services and ensure that data collected can be disaggregated by these stratifiers.
 - Develop a publicly accessible platform to provide interactive access to this consolidated evidence of progress towards UHC.

Conclusion

South Africa has done reasonably well in increasing population coverage – expanding access to the number of services and reaching more of the population, with a general reduction in inequity. However, quality and implementation challenges have persisted. Information systems have improved steadily in scope and data quality over the period, although much more is required to support the realisation of UHC.

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Achieving high-quality and accountable universal health coverage in South Africa: a synopsis of the Lancet National Commission Report

Authors

Laetitia C. Rispelⁱ
 Olive Shisanaⁱⁱ
 Ames Dhaiⁱⁱⁱ
 Lilian Dudley^{iv}
 René English^v
 Gerhard P. Grobler^{vi}
 Thulani C. Masilela^{vii}
 Rajesh H. Patel^{viii}
 Adrian Puren^{ix}
 Russell Rensburg^x
 Jacqui Stewart^{xi}
 Stuart Whittaker^{xii}
 Gustaaf Wolvaardt^{xiii}

Four overarching recommendations are made to ensure high-quality UHC in South Africa: enhance governance and leadership for quality and equity; revolutionise quality of care; invest in and transform human resources in support of a high-quality health system; and measure, monitor and evaluate to ensure high-quality UHC.

A high-quality health system is essential for universal health coverage (UHC), enunciated in the Sustainable Development Goals. In South Africa, the proposed National Health Insurance (NHI) is a health-financing system that pools funds to provide access to quality health services for all South Africans based on health needs and irrespective of socio-economic status. NHI aims to reform the health system towards the achievement of UHC. NHI also aims to give effect to Section 27 of the Constitution, which affirms the right of access to health services for all.

Drawing on the South African Lancet National Commission Report, this chapter summarises the progress made on the provision of quality health care in the 25 years of democracy, notably an enabling legal and policy environment, numerous quality-improvement initiatives, increased life expectancy of the population, and reduced mortality rates. However, significant

challenges remain. The Commission found that gaps in ethical leadership, management and governance contribute to poor quality of care, which results in unnecessary loss of lives. Malpractice and medical litigation are threats to the realisation of the right to health care in South Africa. The Commission underscored the potential of the human resources for health (HRH) crisis to undermine the achievement of high-quality UHC, that fragmentation of quality-of-care initiatives limits their impact, and that health information system gaps hamper the measurement and/or monitoring of quality and its improvements.

Four overarching recommendations are made to ensure high-quality UHC in South Africa: enhance governance and leadership for quality and equity; revolutionise quality of care; invest in and transform human resources in support of a high-quality health system; and measure, monitor and evaluate to ensure high-quality UHC.

i Department of Science and Innovation/ National Research Foundation Research Chair and Professor of Public Health, Centre for Health Policy, School of Public Health, University of the Witwatersrand, Johannesburg
 ii Honorary Professor, University of Cape Town and President's Special Advisor on Social Policy, The Presidency, Pretoria
 iii Steve Biko Centre for Bioethics, University of the Witwatersrand, Johannesburg
 iv Department of Global Health, University of Stellenbosch
 v Division of Health Systems and Public Health, Faculty of Medicine and Health Sciences, Stellenbosch University (previously HST)
 vi Steve Biko Academic Hospital, Pretoria
 vii Department of Planning, Monitoring and Evaluation, The Presidency, Pretoria
 viii Board of Healthcare Funders of Southern Africa
 ix National Institute for Communicable Diseases
 x Rural Health Advocacy Project
 xi The Council for Health Service Accreditation of Southern Africa
 xii Visiting Professor, School of Public Health and Family Medicine, University of Cape Town
 xiii Foundation for Professional Development

Introduction

Globally, universal health coverage (UHC) and quality health care were given renewed impetus with the 2015 United Nations Sustainable Development Goals (SDGs).¹ The values of human dignity and solidarity are central to SDG goal 3, which focuses on healthy lives and the promotion of well-being for all people.¹ In 2018, three global quality reports noted that billions of people will not gain from potential UHC benefits unless improvements in health system quality are realised.² The three reports highlighted the consequences of poor quality, namely patient safety hazards, underuse of evidence-based care, overuse of inappropriate care, lack of patient-centred care, delays, inefficiency, inequity, financial insecurity, collusion, and corruption.² The three reports noted that the “burden of poor quality care” is felt more acutely in low and middle-income countries, because of poverty, suboptimal governance, resource limitations, and lack of, or insufficient accountability.³⁻⁵

In 1994, South Africa emerged from decades of apartheid policies, which have had implications for health policy and for the discourse on a high-quality health system. The proposed National Health Insurance (NHI) is a health-financing system that pools funds to provide access to quality health services for all South Africans based on health needs and irrespective of socio-economic status. NHI aims to reform the health system towards the achievement of UHC.⁶ NHI also aims to give effect to Section 27 of the Constitution, which affirms the right of access to healthcare services for all.⁷

This chapter is a synopsis of the Consensus Report of the South African Lancet National Commission on a High-Quality Health System in the SDG era.⁸ The Commission was launched in May 2017 to conduct country-specific analyses on quality of care consistent with the overall aims and objectives of the Lancet Global Health Commission on High-Quality Health Systems in the SDG Era.⁹ The Commission consisted of 13 members with diverse experience and expertise in academia, health, policy and public and private health sector management.

The methodology of the South African Lancet Commission is described. This is followed by a description of the conceptual framework and definition of a high-quality health system in South Africa. The conceptual framework was used to highlight progress and present the state of quality of care in South Africa, specifically the key diagnostic findings of the Commission. Finally, the chapter presents four overarching recommendations of the Commission.

Methodology

The work of the South African Lancet Commission included several components. A literature review was done on high-quality health systems, including peer-reviewed journal

articles, technical reports, and various health ministerial task team reports. Ten interviews were conducted with key informants in government, the private sector and civil society as part of the Lancet Global Commission subcomponent on “Governing for Quality”. Monthly meetings of the Commission were held, with deliberation on the evidence obtained and inputs received. In December 2017, the Global and all the National Commissions attended a workshop to synthesise the evidence collected on quality of care. The Commission also considered the findings and recommendations of three global reports on quality: The Lancet Global Health Commission Report;³ the World Health Organization (WHO), Organisation for Economic Co-operation and Development (OECD) and World Bank Report;⁵ and the National Academies of Sciences, Engineering and Medicine Report.⁴

The Commission held four national consultative workshops with stakeholders and technical experts in May 2017, November 2017, December 2018 and March 2019. The final report is a synthesis and integration of the evidence and inputs from these processes.

Defining a high-quality health system in South Africa

The South African National Commission deliberated extensively on definitions of quality and a framework appropriate to the South African context. A distinction was made between quality health care and a quality health system, and a definition was developed emphasising an overall health systems approach to quality.

Perceptions of quality vary according to the needs of different stakeholders. Healthcare providers, for example, tend to emphasise the technical quality of care, such as adherence to treatment protocols, infection prevention, and successful treatment outcomes (reduced morbidity, mortality and disability).^{10,11} Patients or community members are more concerned with their experience in the facility, such as cleanliness, amenities, waiting time, and/or the behaviour of staff. Policymakers and healthcare managers focus on health system performance, value for money^{11,12} and population-level outcomes.^{10,11}

The consensus of the National Commission is that a high-quality health system is able to achieve equitable health outcomes and a long and healthy life for all.⁸ The consensus definition is given in Box 1.

The proposed conceptual framework (Figure 1) draws on the definition in Box 1 and takes an overall health systems approach, as proposed by van Olmen et al.¹³ The values of human rights, equity and social justice, enshrined in the South African Constitution,⁷ underpin the conceptual framework. The Commission recognised that the provision of quality health care on its own is unlikely to lead to optimal

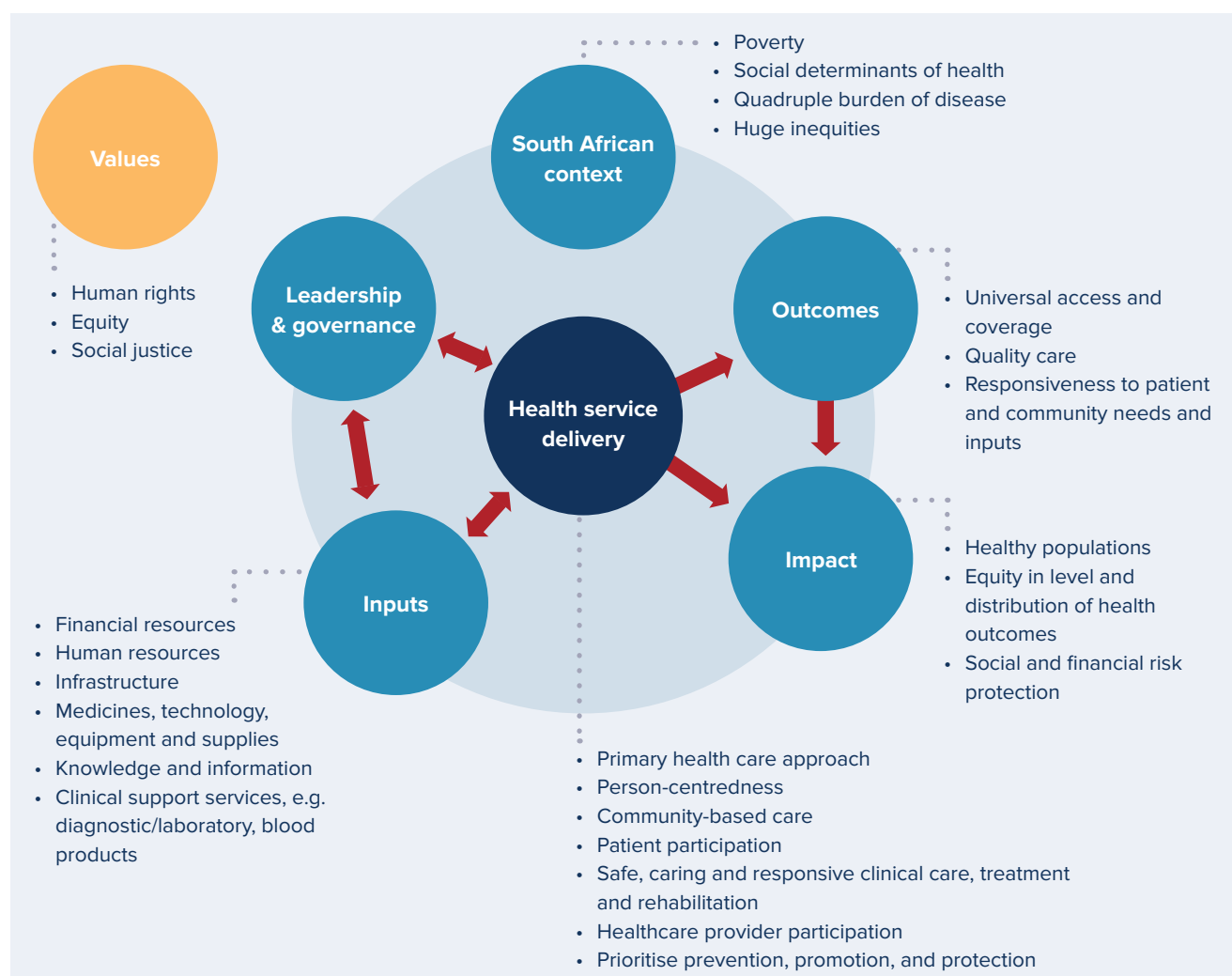
Box 1: Definition of a high-quality South African health system

A high-quality health system achieves equitable health outcomes and a long and healthy life for all. Such a health system is:

- Designed to prioritise health promotion and protection, and the prevention, treatment and rehabilitation of conditions constituting South Africa's disease burden.
- Accountable through effective leadership and governance.
- People-centred in its approach to realising good health by facilitating patient, provider and community participation in health attainment.
- Responsive to patient needs by providing comprehensive care in a timely, respectful and safe manner resulting in quality outcomes.
- Adaptive to changing health needs through the collection, analysis and dissemination of information, to support decision-making and implementation.
- Committed to equitable allocation and distribution of resources.
- Effective in ensuring quality health service delivery to all regardless of gender, sexual orientation, socio-economic status and/or geographical location.
- Collaborative in its interaction with partners and other sectors to address the social determinants of health for quality health outcomes.

Source: South African Lancet National Commission; 2019.⁸

Figure 1: Conceptual framework for a high-quality South African health system



Sources: Adapted from van Olmen et al.; 2010,¹³ and the South African Lancet National Commission; 2019.⁸

health outcomes. This is because socio-political-economic factors are critical in influencing health and wellbeing.¹⁴ Similarly, South Africa's burden of disease is linked inextricably to the socio-economic context. Hence, these aspects were emphasised in the conceptual framework.

Leadership and governance are critical to ensure the inputs required for quality care, and essential for health-service delivery. The inputs in the framework are equivalent to the WHO healthcare system building blocks.¹⁵ The Commission envisaged health-service delivery based on the 1978 Alma Ata primary healthcare (PHC) approach,¹⁶ prioritising disease prevention, health promotion and health protection. At the same time, the necessary treatment and care would span the continuum from community-based care, to safe, caring and responsive clinical care, treatment and rehabilitation.⁸ Person-centredness is critical to treatment and care, facilitating and enabling both patient and healthcare provider participation.

The anticipated outcomes are universal access and coverage, quality care, and responsiveness to patient and community needs and inputs, while the impact of a high-quality health system is a healthy South African population, equity in the level and distribution of health outcomes, and social and financial risk protection (Figure 1).⁸

The state of quality of care in South Africa

The key diagnostic findings of the South African Lancet Commission are shown in Table 1, and discussed briefly below.

Finding 1: Gaps in ethical leadership, management and governance

Section 27 of the South African Constitution obliges government to ensure the right of all citizens to access

healthcare services, including reproductive health, and to ensure that no one is refused emergency medical treatment.⁷

Since 1994, various laws, policies and initiatives have been put in place to improve the South African health system and its performance.¹⁷⁻²⁴ The seminal quality of care initiatives are shown in Figure 2.

The National Health Act (NHA) (Act No. 61 of 2003) provides the legislative framework for the delivery of healthcare services.²⁵ The Act sets out the structures, mechanisms, resources and systems aimed at the progressive realisation of the right of access to healthcare services.²⁵ It lists various governance structures, from the National Health Council, which includes the Minister of Health and the provincial members of executive councils for health, to Provincial Health Councils along with community-led structures and consultative bodies like the Forum of the Statutory Health Professions Council representing all the health professions councils (Section 50).²⁵

The Office of Health Standards Compliance (OHSC) was established in 2014 through an amendment of the NHA²⁶ to regulate quality of care. The OHSC protects and promotes the health and safety of health-service users by effectively managing patient complaints and enforcing compliance with prescribed norms and standards. The OHSC regulates all health establishments in the country and is responsible for monitoring compliance and patient safety.²⁶

Notwithstanding the enabling Constitution, strong health legislation and numerous health policies that express Government's commitment to a high-quality health system, gaps in ethical leadership, management and governance contribute to poor quality of care. These gaps are exacerbated by mismanagement, inefficiencies, and incompetence at various levels of the health system. Corruption and fraud are major threats to equitable access to quality health care.⁸

Table 1: Key diagnostic findings of the South African Lancet Commission, 2019

Finding 1	Gaps in ethical leadership, management and governance contribute to poor quality of care
Finding 2	Poor quality of care costs lives
Finding 3	Malpractice cases and medical litigation are threats to the realisation of the right to health care in South Africa
Finding 4	The human resources for health (HRH) crisis will undermine the achievement of high-quality universal health coverage
Finding 5	Health information system gaps constrain the country's ability to measure or monitor quality and its improvements
Finding 6	There is fragmentation and limited impact of quality-of-care initiatives

Source: South African Lancet National Commission; 2019.⁸

The Health Market Inquiry (HMI) has demonstrated several failures of governance in the private health sector, including failure of funders, health facilities and health professionals.²⁷ The HMI noted that the National Department of Health (NDoH) has failed to use “existing legislated powers to manage the private healthcare market, to ensure regular reviews as required by law, and to hold regulators sufficiently accountable”.²⁷ Consequently, the private sector is neither efficient nor competitive.²⁷ The HMI also found lack of transparency, and lack of accountability to medical aid scheme members, combined with a flawed governance model that aligns scheme interests with those of administrators rather than with those of scheme members.²⁷

There are also governance weaknesses in the Health Professions Council of South Africa (HPCSA)^{27,28} and the South African Nursing Council,²⁹ which are the regulators of the majority of health professionals in South Africa.

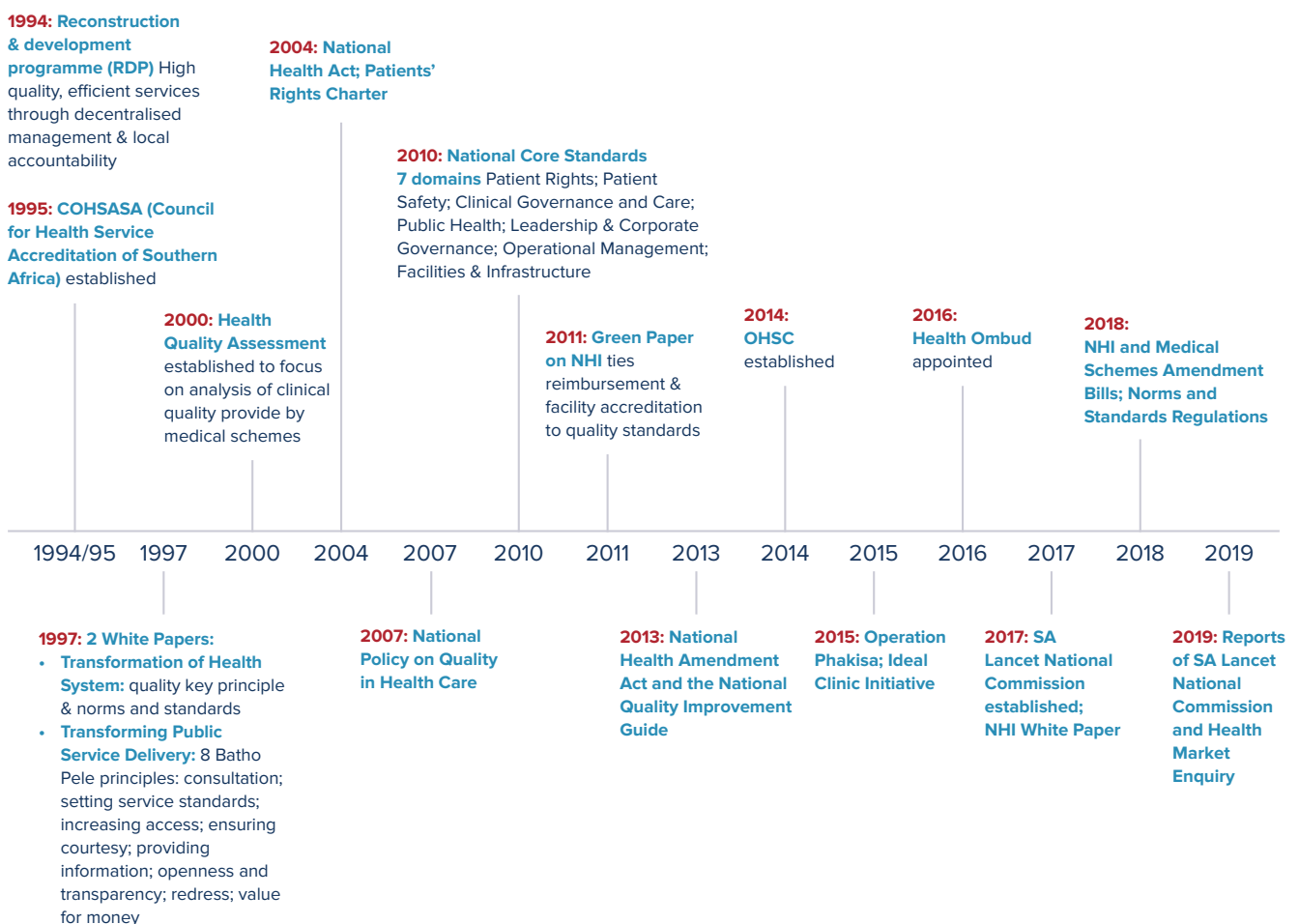
There are numerous barriers to effective community participation, which in turn influence accountability. A 2015 review of community-led governance structures found several challenges in relation to community participation.³⁰ These challenges include: inappropriate

appointment of candidates to hospital boards or clinic committees; limited capacity and readiness of the various actors and structures to fulfil their governance functions; lack of clarity regarding the roles and responsibilities of the various policy actors, especially those at the lowest levels of the health system; and tensions between administrative and community structures.³⁰ The challenges were exacerbated by competing priorities of health managers and providers, lack of skills and technical support to promote public participation, and the complexity of the health bureaucracy in the three spheres of government.³⁰ Furthermore, a 2017 Patient Experience of Care Survey found that of the 168 clinics sampled, only 17.9% had functional clinical committees.³¹

Finding 2: Poor quality of care costs lives

South Africa remains at the forefront of the fight against HIV and AIDS, and has the largest anti-retroviral therapy (ART) programme in the world.³² Adult mortality levels in South Africa have declined substantially because of widespread ART access.^{33,34} Similarly, in the past decade HIV and AIDS has declined significantly as a cause of under-five^{35,36} and maternal mortality.³⁷ However, poor linkage to care following HIV diagnosis and retention in care are of concern, despite

Figure 2 : Key quality of care initiatives since democracy



Sources: South African Health Reviews, 1995-2018.¹⁷⁻²⁴

the expansion in ART eligibility criteria.³⁸ In addition, ART coverage in children living with HIV remains comparatively low at 40% and 49% in 2013 and 2014 respectively.³³ This is despite effective and high coverage in excess of 95% of the prevention of mother-to-child transmission (PMTCT) programme.³³ The main factors for this low ART coverage rate are parental non-disclosure of HIV status, lack of sufficient skills for paediatric ART, and missed opportunities for counselling and testing in other programmes such as maternal and child health.³³

Although the reduction in mortality rates is encouraging, the evidence shows that poor quality of care costs lives.⁸ Since 2008, around 60% of all institutional maternal deaths were potentially preventable, with rural areas more affected than their urban counterparts.³⁷ Rhoda et al. have pointed out that the absolute number of neonatal deaths is unacceptably high for a middle-income country such as South Africa, and that the neonatal mortality rate is not commensurate with the level of government investment in health care.³⁹ An estimated quarter of neonatal deaths are caused by a combination of health system and provider failings, and are thus potentially preventable.³⁹

There is an increasing burden of hypertension and diabetes in South Africa, but inadequate surveillance systems and information gaps in both public and private health sectors constrain disease prevention and management efforts. Existing cascade studies found major deficiencies in the quality of care provided: almost one in two individuals with hypertension were unscreened and undiagnosed (48.7%), one in five were screened but undiagnosed (23%), and less than 10% were controlled.⁴⁰⁻⁴² There are also deficiencies in the quality of care provided to diabetic patients, with poor control of the majority of patients and insufficient screening of complications and/or for co-morbidity.^{43,44}

A study on the quality of integrated chronic disease care in rural South Africa found that a combination of factors mitigated against the provision of high-quality care.⁴⁵ There were malfunctioning blood pressure machines, staff shortages, irregular prepacking of drugs, and long waiting times at facilities.⁴⁵ Patients attributed long waiting hours to late arrival of health workers, shortage of hypertensive medicines, and rigid appointment schedules.⁴⁵ Patients also felt stigmatised by the defaulter tracing method used by community health workers.⁴⁵ In contrast, health-facility managers attributed long waiting times to staff shortages and missed appointments by patients.⁴⁵

Mental illness and substance-use disorders account for a sizeable proportion of the burden of disease, but there is a dearth of research on the epidemiology of these conditions. The main data source remains the 2004 South African Stress and Health Survey.⁴⁶ The study found that 30.3% of South Africans reported having suffered from a mental disorder. In the same study, lifetime prevalence of mental disorders in South Africa was 15.8% for anxiety disorders,

9.8% for mood disorders, and 13.3% for substance-use disorders.⁴⁶ Although there is enabling legislation and a robust mental health policy framework, the lack of implementation suggests a lack of prioritisation of mental health, and under-investment in service delivery.^{47,48} It is estimated that 75% of people with a mental disorder do not receive mental health services, the majority of whom are poor, black South Africans in rural areas.⁴⁹

Finding 3: Malpractice cases and medical litigation are threats

Medical negligence impacts on access to health care.^{50,51} The Medical Protection Society (MPS) estimated that “the long-term average claim frequency for doctors in 2015 was around 27% higher than that in 2009”, while the amounts claimed had escalated by an average of 14% per year from 2009 to 2015.⁵² However, the lack of robust, patient-centred complaint systems contributed to this increase, leaving litigation by patients as the only viable avenue for redress.⁵² Delays are endemic because of the lack of efficient and predictable legal processes for handling of clinical negligence claims. Claim sizes have therefore increased. The cost of settling claims also increases with protracted legal processes.⁵² Protection for patients in terms of the Constitution and the Consumer Protection Act, coupled with increasing patient expectations, have been positive, but they have also contributed to increased frequency of claims.⁵² Importantly, the current system for dealing with clinical negligence does not facilitate efficient and fair resolution of disputes.⁵² Hence, there is need for a system overhaul that addresses the root cause of the problem, namely quality-of-care failures that compromise patient safety and lead to potentially preventable deaths.⁸

Table 2 shows trends in the contingent liabilities for medical malpractice in provincial health departments. At the end of March 2019, National Treasury estimated the total contingent liabilities for medical malpractice in provincial health departments at around R104.5 billion,^a thus placing a huge burden on the distressed health system and reducing financial resources available for health-service provision. The Eastern Cape, Gauteng and KwaZulu-Natal had the biggest claims and highest proportion of contingent liabilities.

Table 3 shows claims payment trends between 2012/13 and 2017/18.^a With the exception of Limpopo, there has been a massive increase in claims paid by provincial health departments. This means that the provincial health departments conceded the medico-legal claims for a range of reasons.

The increased quantity of medico-legal claims and pay-outs are not limited to the public sector. The private healthcare sector is also under pressure, with a sharp increase in insurance for private medical practitioners over the past few years (Table 4). Furthermore, a 2018 study of nursing malpractice cases in Gauteng and the Western Cape highlighted areas of concern in private hospitals.⁵³

a National Treasury. Medico Legal Claims in Provincial Health Departments as at 31 March 2019, unpublished and unaudited data.

Finding 4: HRH crisis will undermine high-quality UHC

South Africa has well-established training institutions, skilled health professionals, regulation of health professional training and practice, and sufficient fiscal space for relatively high remuneration levels in the public health sector.⁵⁴

Notwithstanding these strengths, South Africa's HRH crisis has manifested as staff shortages, and inequities and maldistribution in HRH between urban and rural areas and between the public and private health sectors. There is also ineffective and suboptimal management and leadership at various levels of the health system, and evidence of

Table 2: Trends in contingent liability for medical malpractice in provincial health departments, 31 March 2019^a

Provinces	2014/15 (R'000)	2015/16 (R'000)	2016/17 (R'000)	2017/18 (R'000)	2018/19 (R'000)	% Share 2018/19	Year-on-year increase (R'000)	% Year-on-year increase
Eastern Cape	8 210 838	13 421 136	16 772 732	24 193 619	29 052 620	27.8%	4 859 001	20.1%
Free State	540 365	940 545	1 306 928	1 842 917	2 510 594	2.4%	667 677	36.2%
Gauteng	10 079 281	13 452 064	17 844 047	21 701 514	28 913 749	27.7%	7 212 235	33.2%
KwaZulu-Natal	6 724 865	9 957 126	10 292 463	16 638 734	20 729 836	19.8%	4 091 102	24.6%
Limpopo	1 196 787	1 606 657	2 115 529	4 874 800	8 522 002	8.2%	3 647 202	74.8%
Mpumalanga	1 459 497	2 366 010	5 242 757	7 472 985	10 091 249	9.7%	2 618 264	35.0%
Northern Cape	174 111	342 829	1 220 527	1 605 291	2 440 116	2.3%	834 825	52.0%
North West	33 881	855 737	1 285 126	1 697 205	2 120 231	2.0%	423 026	24.9%
Western Cape	193 395	182 025	135 700	90 350	110 599	0.1%	20 249	22.4%
Total	28 613 020	43 124 129	56 215 809	80 117 415	104 490 996	100%	24 373 581	30.4%

Note: The Western Cape contingent liability does not include all the total claims.

Table 3: Payment trends on claims against provincial health departments between 2012/13 and 2017/18^a

Provinces	2012/13 (R'000)	2013/14 (R'000)	2014/15 (R'000)	2015/16 (R'000)	2016/17 (R'000)	2017/18 (R'000)	2018/19 (R'000)	Growth rates 2012/13- 2015/16 (%)
Eastern Cape	63 359	74 775	74 868	255 561	208 503	423 263	797 434	52.5%
Free State	440	700	196	1 728	1 560	376	3 600	42.0%
Gauteng	145 071	181 802	241 085	572 815	751 082	358 230	586 453	26.2%
KwaZulu-Natal	20 679	97 433	103 536	90 367	251 278	461 919	438 819	66.4%
Limpopo	8 040	25 022	35 073	9 622	74 830	26 773	7 045	(2.2%)
Mpumalanga	13 918	44 080	7 628	15 211	34 255	67 782	39 268	18.9%
Northern Cape	1 437	10 705	3 828	4 844	823	9 493	3 550	16.3%
North West	5 502	10 896	13 246	6 422	29 539	33 274	14 450	17.5%
Western Cape	6 928	23 015	19 272	28 073	38 381	86 984	62 140	44.1%
Total	265 374	468 428	498 732	984 643	1 390 251	1 468 094	1 952 759	39.5%

a National Treasury. Medico Legal Claims in Provincial Health Departments as at 31 March 2019, unpublished and unaudited data.

unprofessional behaviour, poor staff motivation, suboptimal performance and unacceptable attitudes of health workers towards patients.⁵⁵ Human resource information systems are fragmented and unable to inform health workforce planning and training.⁵⁶

In the private sector, an over-concentration of healthcare professionals often leads to unhealthy competition between providers to ensure financial viability, as well as potential over-servicing and fragmented care.⁵⁷ In the public sector, poor or inadequate supervision, insufficient focus on productivity, and abuse of the policy on remunerative work outside the public sector further compound shortages.⁵⁸ These HRH challenges have the potential to undermine the achievement of high-quality UHC, unless this crisis is addressed in a decisive manner.

Finding 5: Health information system gaps

Information systems are a building block of the health system, and an essential part of governance.¹⁵ A high-quality health system requires accurate, reliable and timely health information.^{5,59} Health-information systems enable monitoring of progress in delivering and sustaining quality health services and achieving national health goals.⁵ Information enhances accountability, which in turn improves quality.³

The South African government's commitment to measuring quality has been longstanding, and articulated in various policy documents, including the White Paper for the Transformation of the Health System⁶⁰ and the 2012 National Development Plan (NDP).⁶¹ Hence, there is an enabling policy environment for the development of a health-information system to measure quality.

However, South Africa's health-information systems are partially electronic, not inter-operable, do not make patient-level data available, and are not capable of reporting aggregated data across public and private health sectors, or across levels or care pathways.⁸ Numerous health-measurement platforms exist that provide information on health system inputs, processes, service delivery, outcomes and impacts.⁸ Most of these do not provide sufficient and appropriate information on health outcomes and impacts, nor are they sufficiently person-centred.⁸ Data quality remains a significant barrier to assessing health-system performance on quality of care.⁶²

There is also suboptimal collection, utilisation and reporting of data by healthcare professionals and managers. Furthermore, there are insufficient expertise and skills within the public sector to support data analysis, feedback and reporting.⁸

Finding 6: Fragmentation and limited impact of quality-of-care initiatives

Quality improvement is a change process that should lead to better patient outcomes (health), better system performance (care), and better professional development (learning).⁶³ The Commission found a wide range of quality-improvement programmes in South Africa delivered by government, non-governmental organisations, and academic and research institutions.⁸ However, there are substantial gaps in the coordination and implementation of quality improvement as a national strategy, namely in mobilising stakeholders, in learning lessons from quality improvement experience and expertise, and in supporting implementation across sectors and levels of the health system. Hence, the impact of quality-improvement initiatives is limited.⁸

Table 4: Nursing malpractice and medico-legal claims in the private sector

<p>Case outcomes</p> <ul style="list-style-type: none"> • 122 cases were closed. • 25 cases resulted in death. • The malpractice affected the quality of life of approximately 69% of the 122 patients. • Approximately 43% of the patients had additional surgery. • Approximately 25% of the patients were left disabled. • Approximately 79% of the patients spent extra days in the hospital.
<p>Audit analysis of malpractice litigation cases in nursing practice in private health care in South Africa</p> <ul style="list-style-type: none"> • Nurses did not pay attention to basic nursing procedures such as postoperative assessment. • Nurses ignored critical complaints from patients, resulting in severe consequences. • Nurses were unable to interpret readings on machines monitoring patient conditions. • Nurses failed to follow practice guidelines.
<ul style="list-style-type: none"> • Poor HRH governance: Auxiliary nurses were assigned to duties beyond their scope of practice, even in critical units such as theatres.
<ul style="list-style-type: none"> • High costs of medico-legal claims were paid by private hospitals but may be passed on to consumers of private health care.
<ul style="list-style-type: none"> • The majority (74%) of the medico-legal cases were handled in secret, out of the public domain.

Source: Stellenberg et al., 2018.⁵³

Recommendations

The Commission proposed four overarching recommendations, discussed below:

- Enhance governance and leadership for quality and equity.
- Revolutionise quality of care.
- Invest in and transform human resources in support of a high-quality health system.
- Measure, monitor and evaluate to ensure a high-quality health system.

Recommendation 1: Enhance governance and leadership

The Commission recommended that there should be emphasis on ethical and effective leadership and management at all levels of the health system. These individuals should embody the values of integrity, competence, responsibility, accountability, fairness and transparency. Leaders need to answer for the execution of their responsibilities, even when these are delegated. Conflicts of interests must be avoided or managed proactively.

Key strategies in ensuring governance and leadership for quality are: prevention of fraud and corruption; strengthening of community structures such as mental health review boards, hospital boards, and community or clinic health committees; investment in and increased capacity of the OHSC; enhancement of the capacity and effectiveness of the Council for Medical Schemes; and strengthening governance, effectiveness and efficiency in the various health professions councils.⁸

Recommendation 2: Revolutionise quality of care

Key strategies here are to: revitalise the provision of responsive, high-quality clinical care that responds to the burden of disease; prevent medical malpractice and litigation; embark on a national campaign to educate patients and communities about their health rights and responsibilities; and design an integrated, quality-improvement Programme of Action (POA).⁹ The POA should cover the entire health system and all modes of healthcare delivery in public, private-for-profit, non-governmental and community-based organisations. The POA should prioritise implementation in rural and under-served areas, and in the public health sector.

Recommendation 3: Invest in, and transform, HRH

The Commission recommended the development of a transformative HRH plan, and a complementary national social mobilisation campaign to increase health worker awareness of quality-of-care issues. The campaign should focus on health rights within the context of the Bill of Rights;⁷ the responsibilities of individuals for their health; and the rights, responsibilities and individual accountability of health

workers.⁸ Public-sector health managers should be recruited based on merit and core competencies in line with the provisions of the Public Service Act.

The Commission also proposed that a compulsory module on quality of care should be included in both pre-service training and continuing professional development programmes of health professionals. The Commission recommended that the NDoH should mandate each health professions council to do an audit of the time allocation on quality of care in the curriculum of pre-service education programmes.⁸ Based on the results of the audit, quality of care and improvement methods should be integrated in all courses, and a mandatory and compulsory competency of health professionals, prior to registration. Each health professions council should also stipulate continuing professional development in quality of care and encourage a culture of learning that rewards transparency, accountability and continuous improvement.⁸

Recommendation 4: Measure, monitor and evaluate

The Commission recommended that the NDoH should develop an initial list of performance targets that measure quality outcomes in the health system, to be expanded in the course of time. These targets should be based on existing information, rather than new information collected in both health sectors. The NDoH should prioritise analysis, interpretation and feedback of these key indicators (which would constitute a dashboard) with interrogation of variances, similar to those for financial indicators. The health information system should be strengthened, and implementation of the dashboard should be appropriately staffed and resourced. Managers should be trained in use of the dashboard for decision-making and action. The dashboard should be presented and explained to governance structures, to enable effective oversight.

The Commission recommended strengthening of the NDoH's Health Information System development, implementation and oversight, as well as the collection, reporting and use of appropriate quality information in both the public and private health sectors. Lastly, the Commission recommended the expansion and strengthening of the stewardship role of the National Health Information System of South Africa.

Conclusion

The Commission noted that implementation of the recommendations requires strong leadership and stewardship from the NDoH. This will require the Department to enhance its technical capacity to enable it to monitor the implementation of legislation and key policies in provincial health departments and in regulatory entities. This could be done through appointment of new staff, re-skilling of existing staff, and/or partnerships with universities and science councils.

The Commission stressed that it is an ethical and moral imperative to implement the proposed recommendations because the nation and the many committed, hard-working health managers and healthcare providers deserve a high-quality health system. The legislative and policy foundation for a well-performing health system is largely in place. Strong stewardship and leadership for implementation are the logical next steps to build on the global momentum for high-quality UHC.

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The Health Market Inquiry and its potential contribution to improving health systems functioning in South Africa

Authors

Lungiswa Nkonkiⁱ
Ntuthuko Bhenguⁱⁱ
Mapato Ramokgopaⁱⁱⁱ
Sharon Fonn^{iv}

The HMI found that private health care in South Africa is characterised by high and rising costs in a predominantly fee-for-service market, with little innovation, and that large profit-making players were not challenged by new entry into the market or disciplined by losing custom.

In 2014, the Competition Commission of South Africa instituted a market inquiry into the South African private health sector in order to ascertain whether there were features or a combination of features preventing, distorting or restricting competition. Adjustments were made to the provisional report of the Health Market Inquiry (HMI) based on stakeholder input, and the final report was released in 2019.

The HMI found that private health care in South Africa is characterised by high and rising costs in a predominantly fee-for-service market, with little innovation, and that large

profit-making players were not challenged by new entry into the market or disciplined by losing custom. Increasing health care consumption, over and above that which can be explained by disease burden and acuity, were found to be driving increased hospital admission rates and rising costs.

The findings of the HMI were reported in three categories: facilities, practitioners and funders, each of which is described below. The focus of the chapter is on selected system-wide recommendations relevant to more equitable health-systems development in South Africa.

i Department of Global Health, Division of Health Systems and Public Health, Faculty of Medicine and Health Sciences, Stellenbosch University
ii Independent Health Policy Advisor
iii Competition Commission of South Africa
iv School of Public Health, University of the Witwatersrand, Johannesburg

Introduction

Market inquiries are a general investigation into the state, nature and form of competition in a market; they explore the incentives operating in that market, how those incentives drive market behaviour, and whether the market benefits consumers or not. In a health market that benefits consumers there is effective competition in the market based on price, quality and health outcomes. While there is much debate around whether health care should be a commodity and whether economic market analyses can be applied to healthcare provision, health care is nonetheless sold in the private sector and private beneficiaries are estimated to consume approximately 40% of healthcare benefits annually,¹ while representing only 15.5% of the population.²

In 2014, the Competition Commission of South Africa instituted a market inquiry in terms of section 43B(1)(i) of the Competition Act³ to investigate whether there were features or a combination of features preventing, distorting or restricting competition in the private health sector.⁴ The resultant Health Market Inquiry (HMI) released two reports, with the findings described at length in the provisional and final reports.^{5,6}

The HMI process involved significant engagement with stakeholders, and there was agreement across the board that intervention of some kind is required. Multiple market failures were found, requiring government intervention to ensure that consumers are protected.

Summary of the HMI findings

The HMI found that private health care in South Africa is characterised by high and rising costs in a predominantly fee-for-service market, with little innovation, and that large profit-making players were not challenged by new entry into the market, or disciplined by losing custom. Rising costs, in particular in the hospital market, were found to be driven by increasing hospital admissions. The practitioner market was found to be over-serviced, and in both markets, factors other than disease burden and acuity were found to be influencing levels of utilisation.

The findings of the HMI were reported in three categories: facilities, practitioners and funders, each of which is described below.^a

Facilities market

The HMI found that the facilities market was dominated by Netcare, Mediclinic and Life Healthcare, which collectively own 83.1% of the hospital beds in the private sector and

accounted for 86.9% of admissions from 2010 to 2014, with each group individually accounting for about one-third of the market.

The HMI noted that the dominant hospital groups did not seem inclined to compete vigorously with each other; used their market share to negotiate better per-day rates with purchasers (schemes and administrators); and recorded consistent year-on-year profits. The three big companies are also able to dominate the market by offering doctors, who have admission rights over patients, attractive packages to practise in their facilities, thus indirectly influencing admission rates. The implication of this is that larger hospitals out-compete small hospitals by attracting doctors who then admit patients into their facilities.

Practitioners

No accurate database exists on the number of practitioners active in the private sector. Using claims data, the HMI found that there are 1.75 private practitioners per 1 000 insured population. While general practitioners (GPs) are evenly distributed across the insured population (just under one per 1 000), specialists are concentrated in provincial capitals and metropolitan areas. Most doctors work in solo practices, except for single-discipline group practices such as radiologists, some anaesthetists, and corporate pathology groups. Multidisciplinary groups that allow for up- and down-referral are notable by their absence. This kind of organised care is not well supported by funders and some practitioner associations and is limited by the current Health Professions Council of South Africa (HPCSA) ethical rules. Fee-for-service is almost ubiquitous. Following on the ruling by the Competition Commission that collective bargaining between funders and practitioners was anti-competitive, and the failure of the National Department of Health (NDoH) to establish a workable reference pricing system, there has been what has been described as a “price (reference) vacuum”.⁶ Practitioners have indicated that the prohibition on collective bargaining has meant that they cannot meet without risk of sanction. Nonetheless, they co-ordinate how they use and define codes, which are the basis for charging. Coding is also out of date, and unilateral code changes have taken place. A competition analysis of practitioner associations suggested that they engage in quasi-collusive behaviour. Practitioners either do not know about or flout the law regarding co-operation between private sector players.

Using detailed medical scheme claims data from 2010 to 2014, it was found that hospital admission rates increased by 1.99% per year. The HMI compared the total days of hospital stay per person per year in South Africa with available Organization for Economic Co-operation and Development (OECD) datasets, covering 17 high-income countries. The citizens in the comparator countries had universal coverage through publicly funded national health or insurance schemes and thus were expected to have similar or greater access to care compared with the insured population in South Africa. Not only

a Facilities: This included private hospitals only. Practitioners: The analysis was restricted to doctors, both general practitioners and specialists, while recognising that the term ‘practitioners’ includes other health professionals such as physiotherapists, dentists, etc. Funders: This included not-for-profit medical schemes, for-profit healthcare administrators, and managed care organisations.

have South African age-standardised rates of admission risen over time, but they are higher than those in most of the OECD countries for which complete data were available, as shown in Figure 1.

The HMI also investigated the relationship between the concentration of specialists and the number of hospital admissions; in general, it found that the higher the concentration of specialists, the higher the admission rates. This is a phenomenon known as supply-induced demand and is common in many, if not all, healthcare markets.

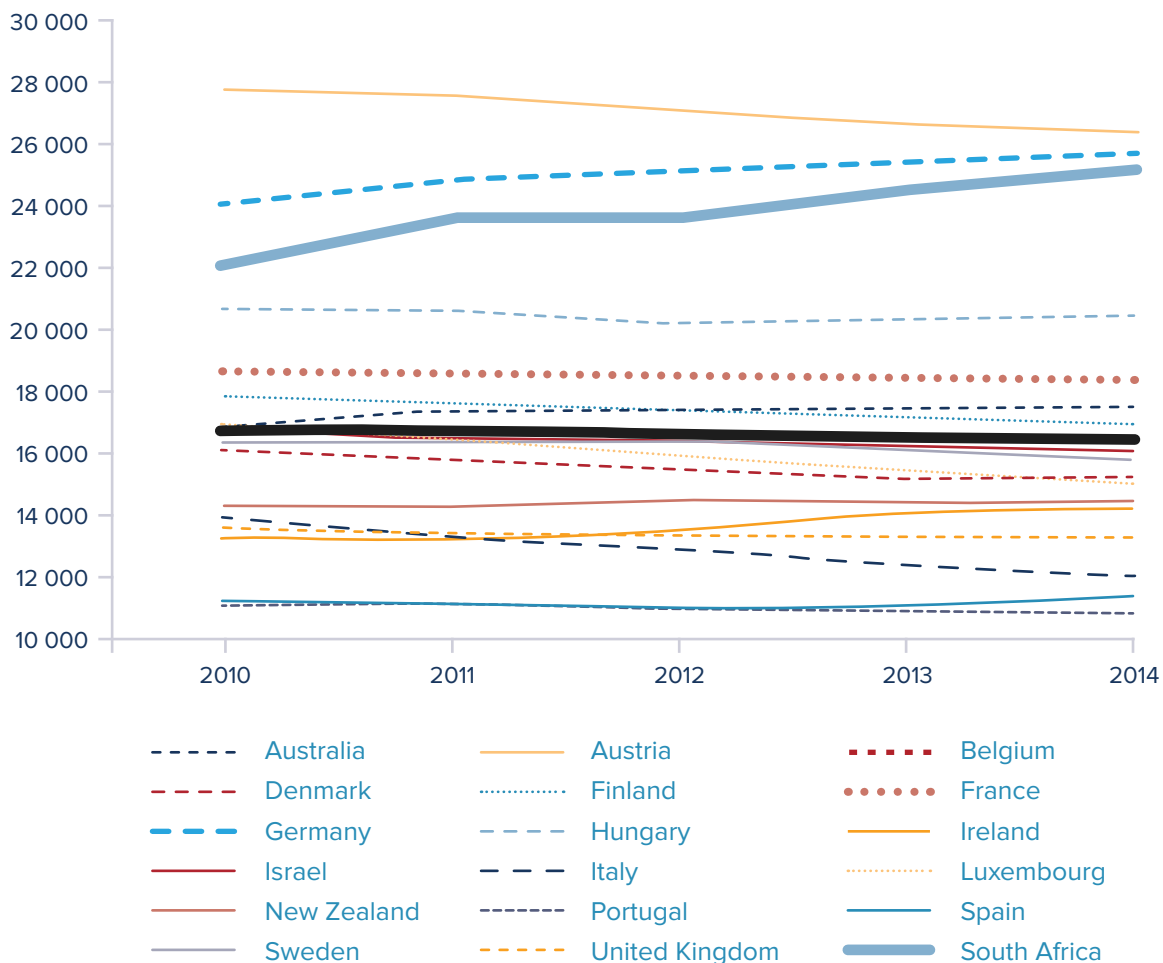
Age-standardised intensive care unit (ICU) admission rates in South Africa were found to be higher than in all eight countries for which there were comparable data. If the ICU admission rate per head of population was reduced to half its current level, and if half of the costs associated with these avoided ICU admissions were reinvested in better ward-based care, approximately R2.7 billion would still be saved annually – just over 2% of private healthcare spending overall for the

period studied. The HMI also found that there was a positive correlation between the risk of admission, and the existence of more ICU beds.

Funders

The funder market, schemes, administrators and managed care organisations, also respond to the incentives framing its operations. Incentives include that no-one may be refused membership of a medical scheme if they can pay the costs (open enrolment), and that they have to be charged the same fee as others joining that option (community rating), which cannot be based on health status. They can be charged a late-joiner penalty if they have not been a member of a medical scheme for a number of years. If joiners have not been beneficiaries of a scheme before, they may be subject to a waiting period (of some months) for pre-existing conditions. This is to make up for the loss that schemes experience if people join only when they are sick and know that they will need care (referred to as anti-selection). This approach is to ensure social solidarity, i.e. the healthy cross-subsidise the sick.

Figure 1: Age-standardised hospital admission rates for the South African private sector and a subset of 17 OECD countries, 2010 - 2014



Source: Health Market Inquiry, 2019.⁶
 OECD = Organization for Economic Co-operation and Development.

In almost all jurisdictions with open enrolment and community rating, scheme funds are reallocated to standardise the risks. Thus, a scheme that has people in it who are more ill than the average would receive a net income from other schemes. Governments aim to equalise the risk between schemes by creating a risk-sharing mechanism in order to reduce the incentive for schemes to compete for members on a risk basis. In summary, a virtual fund is formed, pooling all income from all schemes; money is then paid into schemes where risk is on average higher than in other schemes.⁷

Although South Africa has explored this policy option, it has not been implemented. There is evidence that South African funders have competed to get younger, and thus healthier, people to join their schemes. They have also created a large number of benefit options so that members are forced to risk rate themselves; less healthy people choose higher-cost schemes. Schemes and administrators have claimed that they do this to increase choice and meet the market's diverse needs; however, the HMI was not in agreement with them. The HMI found that funders have not negotiated vigorously with the supply side of the market. Hospitals are very concentrated and practitioners (in particular specialists) can, to a large extent, set their own income, in particular when it comes to the ruling that prescribed minimum benefits (PMBs) must be reimbursed in full. Rather, funders have either passed on extra costs to their members, and/or have limited the range of services that are reimbursed. The HMI concluded that a risk-adjustment mechanism is essential to address this problem. The HMI has also recommended a single identical base benefit package that every scheme has to offer and all medical scheme members have to buy.

The HMI found that there was insufficient transparency in the private healthcare market, and that consumers cannot understand what they are buying; as such they are unable to compare what one scheme/option is offering against another. This is compounded by the high number of options available. To address this problem, the HMI has recommended that every scheme offer one base benefit package that everyone has to purchase. In this way, members can compare between schemes, and this mechanism will force funders to negotiate vigorously with suppliers.

Another policy option that often accompanies open enrolment, community rating and risk equalisation is mandatory membership. The HMI supported this idea, in principle, but recommended that it only be introduced once the other incentives such as fee-for-service, a new tariff regimen, the single base package forcing changes on the supply side, and transparency on value had taken effect and changed the behaviour of market players. Once the market was able to demonstrate its ability to move towards pro-consumer competitiveness, mandatory membership could be considered. This is an incentive to the market to improve its competitiveness.

The Inquiry found that while one-on-one tariff negotiations between funders and hospitals are practical, there is a need to change from a fee-for-service basis to alternative payment models that include real risk transfer.

Networks are a mechanism whereby a medical scheme negotiates with a hospital group for the group's hospitals to be part of the recognised scheme network. Those hospitals charge a known rate for members of that scheme and do not charge the scheme member a co-payment. These networks have shown some limited benefit and need to be encouraged further. However, negotiations between funders and practitioners are not practical; there are too many practitioners, and a new system is required that is consistent with competition law and that will not result in a stalemate or extended legal challenge.

One of the fundamental requirements of an efficient market is that purchasers receive value, which is a combination of cost and quality. In South Africa, there is little publicly accessible information on quality, and no information on health outcomes. Patients do not know whether the intervention prescribed is on average associated with improved health outcomes, whether their doctor or the hospital that the doctor is admitting them to is of higher or lower quality than another, and whether one doctor gets better outcomes than another. Even doctors themselves cannot know if they achieve better outcomes than their peers.

The excessive utilisation driving healthcare costs in South Africa could theoretically be justified if it was resulting in very significant positive health outcomes at an acceptable cost, but there is no way to assess this. The HMI noted this as an important and urgent gap to fill.

Recommendations

The section below details some of the system-wide recommendations of the HMI which are relevant to the development of equitable health systems.

Demand-side regulation

The HMI recommended that the functions of the Council for Medical Schemes (CMS), which already exists as a demand-side regulator, be extended, and that the CMS review of PMB regulations (to ensure that these include primary care functions and that they are provided out-of-hospital when appropriate) should continue. Defining the new base benefit package in consultation with stakeholders, which all schemes must offer, was also an important task recommended for the CMS. This intervention will dovetail with work required to define a basic package for the NHI.

New tariff negotiation regimen

A new tariff negotiation regimen has been recommended, which requires that the CMS review and approve funder-hospital and funder-practitioner contracts. This is to ensure that three conditions are met in bilateral contracts: that they are negotiated on the basis of value (that is price and quality); that they include risk transfer components; and that they are in line with competition law. The recommendation indicates that hospital-funder contracts change to value-based contracts within a two-year period. In the case of practitioners, it is expected that this may take longer to achieve. This is a major lever to move the market towards alternative reimbursement models.

The HMI has recommended that the CMS re-establish its risk-adjustment capacity and set in place the processes required to set up a risk-adjustment mechanism (RAM), which includes income cross-subsidisation. Fundamentally this involves the administrator of RAM (the CMS in the initial stage) developing relationships and memorandums of agreement with key stakeholders such as the South African Revenue Service (SARS), National Treasury, the NDoH, administrators and medical schemes, and the financial sector to integrate both risk and income in the subsidy. The shadow Risk Equalisation Fund process showed that approximately 80% of variation in risk can be attributed to age and gender alone. As age is correlated with income, implementation of a RAM would mean healthy, younger, low-income individuals would be subsidising higher-income groups. To avoid this, the HMI recommended that the current tax credit regimen be reconstituted to take the form of a subsidy. All medical schemes, both open and restricted, must by law be required to belong to the RAM. Legislation will need to be changed to allow the administrator of the RAM to develop a database of all insured beneficiaries and the relevant demographic information to determine the prospective risk status of each beneficiary. Similarly, information on members' income needs to be obtained, stored securely, and subject to suitable confidentiality provisions.

An operational RAM will remove the incentive for schemes to compete on risk and this will be further entrenched by the single comparable base-benefit package. This will drive competition on the supply side of the market, which will force greater efficiency.

Supply-side regulation

Negotiation of prices and contracts

The HMI has identified a number of inadequacies on the supply-side of the market. To tackle the fundamental problem of tariffs, the HMI has recommended that a multi-lateral negotiating forum (MLNF) be set up that sets the terms of and oversees tariff negotiations between practitioners and funders. The benefit of this will be that because it is set up under the auspices of the Competition Act, parties will have to share information beforehand. This will reduce the information asymmetry that currently exists in practitioner-funder price determination. It will also set

in place a new deadlock-breaking mechanism whereby an independent arbitrator will determine the price if no agreement is reached. As it will not be permissible to present new information to the arbitrator, this will encourage parties to come to the negotiation with their best offer, and avoid court delays. The forum will set a maximum price for PMBs, which will reduce the space that practitioners have to set the degree of intervention and thus their related income in the current 'payment-in-full' scenario. Government would benefit by participating in this process as some conditions will always require a fee-for-service option. It will introduce government to a form of negotiation that it has as yet not had to participate in.

This funder-practitioner negotiation system proposed by the HMI also sees a place for bilateral negotiations between funders and collectives of practitioners who want to negotiate using an alternative (i.e. not a fee-for-service) method of payment, such as a capitation system, using a multidisciplinary team. This leaves room for innovation in the market.

Licensing as an effective regulatory tool

Licensing of hospitals is currently the only direct form of regulation of the hospital sector, and the HMI found it to be irrational, inconsistent, and insensitive to competition issues. Licensing has not taken into account the population needs of the area where the hospital services are being proposed; the effect of the proposed hospital on supply-induced demand; the impact that hospital provision may have on meeting needs beyond the private sector as public purchasing becomes a possibility; and the impact on utilisation of the type of beds approved (e.g. ICU beds and acute-hospital versus day-hospital beds).

The HMI also identified a missed opportunity in the licensing system, namely to link annual licence renewal to reporting requirements that are essential to manage the health sector. The HMI recommended that reporting should include quality indicators, occupancy rates, bed types, and listing of service providers (including if any service provider is also simultaneously employed in the public sector).

The HMI's licensing proposals are detailed and stipulate who should be on the licensing committee, and how licensing should be approached in a two-phase process to prevent issuing of evergreen licenses that are never realised or that are sold on; the proposals are also mindful of the role of the Office of Health Standards Compliance (OHSC) in accrediting hospitals, and the role of provinces in oversight. Licensing is currently separate from OHSC approval, and the OHSC indicated to the inquiry that private hospitals were not cooperative. Including OHSC certification as a prerequisite for annual licence renewal would create an incentive for private hospitals (and private providers who operate from their own premises) to comply. The HMI therefore proposed that continued licensing be conditional on annual reporting, and that this be a lever used to ensure compliance of private hospitals with regulatory requirements. The HMI

also considered the skills and resources required to run a rational and efficient licencing regimen and envisaged quite broad membership, with specific roles ascribed to each member.⁶ Duplicating this function in each province is wasteful, and in all likelihood not possible. Therefore, a single national body is proposed, with representation from the province where the licence is being applied for. This will ensure a well-resourced licensing system and take provincial concerns into account. This integrated approach of public and private players and regulators will set the basis for rational decision-making across the entire health system and move the systems closer towards the unity ultimately envisaged. The current approach has been inconsistent, but evidence presented to the HMI also indicated that provinces were unable or unwilling to oversee the private sector. Provinces were reported to be resistant to demanding, collating or reporting on private hospitals. Ignoring the private sector in this way makes specialist entry into the private sector too easy, to the detriment of the public sector, ignores mechanisms for managing abuse of remuneration of work outside of the public sector (RWOPS), and allows unmanaged proliferation of hospital beds, which exacerbates the nursing shortage, in particular with regard to ICU nurses.^{8,9}

The practice code numbering system

The entire reimbursement system in the private sector relies on practice codes. This, too, presents an important opportunity to promote quality and to have a method of describing the physical health resources in the country. The HMI has recommended that both doctors' surgeries/rooms as well as hospitals be given a practice code number conditional on achieving OHSC certification. As providers will not be able to be reimbursed without such a number, this will be useful as a lever to promote compliance. It will also allow the NHI Fund, once it begins to purchase, to know where both GP and hospital resources are located and have some reassurance of minimum quality standards being met.

Individual private practitioners (including but also beyond GPs and specialists) must have a practice code to bill; thus, this can be a lever to induce reporting, which any health system needs in order to plan and protect the public. This requires that the current Practice Code Numbering System (PCNS) for individual providers (as opposed to their premises) be revamped into an intelligent number system with annual reporting by practitioners so that physical location, area of speciality, full/part-time status, and concurrent employment in the public sector can be codified. The HMI recommended extending this requirement to both public and private providers so that all providers are inducted into a system where obligatory reporting on outcomes is routine. This will provide a national practitioner resource picture for the country, and the PCNS would become a public good in the public domain, overseen by a public entity. It will also require close collaboration with all statutory health profession council regulators to ensure that each applicant is compliant with the requirements of his or her professional body in order to practise.

Coding of healthcare interventions

The HMI found that the current billing system, where interventions are converted into codes, was out of date and subject to manipulation, and that investment and national standardisation of codes are required. The HMI has recommended that this be undertaken by rational and disinterested parties.⁶ This is a public good and should be identical across the public and private sectors. It therefore makes sense that it is managed by a trusted body that consults appropriately in setting up and renewing codes. Existing mechanisms to do this in either the public or private sector can be brought together under a supply-side regulator.

Value-based purchasing

The only way to assess if an intervention is worthwhile is to assess whether it improves health outcomes, to know the costs, and to make an assessment as to affordability. Two component parts contribute to this. One is health technology assessment (HTA), a term that embraces more than just single interventions or technologies, but also includes assessment of whether different modes of delivery (for example) are more cost-effective. This is a missing element in our healthcare system, both public and private, and the HMI has recommended that it be established and add value across both sectors. The HMI is cognisant that the safety and registration of products is the ambit of the South African Health Products Regulatory Authority (SAPHRA), which can provide the HTA system with information as required. The HTA function can be homed in a supply-side regulator for healthcare (SSRH) that serves both the public and private sectors.

The other component is outcomes monitoring. This is different from satisfaction surveys or process measures. Outcomes monitoring can indicate if an intervention improves patient wellbeing. It is important, in particular but not exclusively from a competition point of view, in order to purchase on the basis of value. Outcomes measurement can improve the sensitivity of HTA. It also allows healthcare providers to benchmark themselves against their peers, and makes rational planning possible. Again, this is an essential missing component in both the private and public healthcare sectors. But different from all the other interventions listed thus far, experience has shown that this is best embraced outside of a regulatory environment.¹⁰ The HMI made a detailed recommendation (in Chapter 8 of the final Report)⁶ that a practitioner-led, patient-oriented system be instituted, initially on a voluntary basis, but ultimately as a reporting requirement to entitle practitioners to receive a practice number.

A supply-side regulator

There is no doubt that supply-side regulation is required. While there is consensus that regulation is required, the notion of a new regulator is not universally supported. The HMI considered this in great detail and concluded that to give coherence to the system, a SSRH is essential. This structure will house and coordinate the multiple

regulatory functions essential to improving the efficiency and effectiveness of the private health market. As already noted, aspects of its work are relevant to the public sector, in particular systems to ensure quality and health outcomes reporting, and having up-to-date accurate information on the location and number of providers (both individuals and types of beds) benefits health-service planning at a national level. The SSRH will also provide skills and expertise and some requirements that are valuable to the public sector and that can support value-based purchasing. The oversight of contracts is the most obvious example. In rationalising the supply-side of the market, the HMI took note of the OHSC and its intended role in both the public and private sectors, as well as the existing efforts of the NDoH in setting up HTA capacity. These two functions, namely quality control and rational resource use, are important to the public and private sectors. Thus the HMI does not envisage an increase in the total number of regulators, as the OHSC, with some extended functions, will be part of the SSRH. Rather, the HMI recommends that existing supply regulatory efforts already underway be incorporated within a single body. This coincides with the cost-saving measures indicated in the 2019 mid-term budget policy as the SSRH would consolidate and merge entities; however, it also contradicts the mid-term budget policy as the HMI proposes an extension of regulatory functions.¹¹ Nonetheless, the regulatory absences identified by the HMI, if implemented, would increase pro-consumer competition in the market, and the same mid-term budget policy noted the relationship between competition and growth.

The HMI argues that the establishment of the SSRH is in the best interests of the health system overall, especially taking into account the long-term view of the possible system changes. The HMI has argued that enhancement of the mandate and relocation of the OHSC within the SSRH would mean that there is no net change in the number of regulators. Incorporation of the OHSC into the SSRH would also give the OHSC the independence that was envisaged for it. Moreover, it would provide a home for the HTA functions already envisaged by the NDoH, and within the SSRH this function can and should serve both the public and private sectors. Importantly, the proposed HMI regulator will achieve two additional things. Firstly, by making this both a public- and private-sector function there is an opportunity to fund this function in part through a levy. Secondly, the governance structure proposed by the HMI will ensure independence from vested interests, both public and private.

Furthermore, to achieve the supply-side regulation, which almost all stakeholders agree is urgently required, through any other mechanisms is likely to require as many legislative changes and incur similar investments without the same coherence. A single regulator will avoid duplicate investment in funding, administration, management and governance. An independent SSRH will enjoy greater credibility and enhance decisions on purchasing that are made for the NHI Fund and for the private sector. This new

regulator, set up within the governance format proposed by the HMI,⁶ will likely minimise risk and build trust.

Additional recommendations

The HMI has made additional recommendations, including to the HPCSA about their ethical rules, and through them to health-practitioner training institutions and to the Competition Commission, as well as detailed recommendations on the nature of contracting in the private healthcare market. This chapter has highlighted those recommendations that are system-wide and relevant to more equitable health systems development in South Africa.

Linking the HMI recommendations with the NHI Bill

Full implementation of the NHI is scheduled for 2026. This is ambitious, government has indicated that it is not immediately affordable,¹¹ and the Act may face legal challenge. Government's responsibility is to oversee the entire health sector. The HMI has identified, among other things, that inadequate or inappropriate regulation of the private sector has allowed it to develop uncompetitively to the detriment of consumers. The inefficient private sector draws resources, in particular human resources, to the detriment of the public sector. Attention must be given to furthering the ambitions of the NHI Bill, and a number of recommendations from the HMI promote this.

The missing regulatory functions described above are relevant to both the public and private sectors. Setting them up now in light of the HMI recommendations, and using the governance and funding processes recommended, will create institutional capacity for both sectors. The CMS and SSRH contract-oversight mechanisms to ensure that contracts (public-private or private-private) are value based, and that they include risk transfer and are compliant with the Competition Act, will shift the negotiating terrain to one of value purchasing, and could provide a method to ensure that contracts are not skewed by vested interests, public or private. This would provide some guarantee for both private and public healthcare users that contracts are delivering value, and will build trust. At the point that the NHI Fund begins to procure healthcare services they will engage with private providers who are more comfortable with value-based purchasing, but the brunt of forcing that change will be borne by the private sector.

Similarly, setting up the HTA functions, the new licensing regimen, and developing a national procedure coding and practice number system is urgent and of benefit to both

sectors. Locating these in an independent supply-side regulator is desirable as it could be co-funded by a levy system and provide a governance model that engenders trust. The single base-benefit package must have a transparent logic that drives prioritisation; the same is true of the NHI package, and having a single approach to prioritisation gives credibility to both systems and begins to align them.

Protection of the Competition Act provides advantages. Without it, even if government were to set prices, providers (hospitals and practitioners) can collude legally. Obligatory sharing of information, in particular on occupancy rates as one example, is important information for both parties to know when negotiating hospital rates.

While the RAM appears to contradict the single fund, in the interim it presents many opportunities. Beyond its competition function, it allows for income cross-subsidisation. The active and willing participation of the private sector in the shadow risk equalisation process indicates that a RAM is possible and that the skills in running it can be reassembled and extended. Even if it is managed as a separate entity, over a period of five years the RAM may well be in a position to transfer funds in a transparent and managed way, on a risk-adjustment basis, into a national fund that purchases on behalf of public-sector users. This may present a more efficient and acceptable method of pooling funds and ensuring cross-subsidisation.

Conclusion

The HMI recommendations are not in opposition to realisation of the ambitions of the NHI Fund. Adopting the HMI recommendations can build a range of institutional and individual capacities to manage healthcare provision in South Africa. The funding mechanism and governance proposed deal with some of the governance concerns that are central to the current critique of the NHI Bill. In addition, oversight of contracts between purchasers and providers is a strength (be they public-private or private-private contracts). The HMI recommendations also provide an opportunity to build national capacity for a more rational healthcare system in South Africa by using both public and private funding. The uncontrolled and irrational (not aligned with population health needs) growth of the private market is an obstacle to achieving the aims of the NHI Fund.

Conflict of interest

Three authors (LN, NB, and SF) were panel members on the Health Market Inquiry, and one (MR) was a member of the HMI technical team and the Inquiry Director.

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Optimising beneficiary choices:

standardisation of medical scheme benefit options

Authors

Phakamile W.F. Nkomoⁱ
Steven F. Kochⁱⁱ
Evelyn M.M. Thsehlaⁱ
Michael M. Willieⁱ

Market segmentation analyses suggest that beneficiaries are confused by too many benefit options; that choice sets facing different beneficiaries are not the same; and that information is not equally accessible.

A salient finding of the Competition Commission's Health Market Inquiry Provisional Report on the functioning of the health market is that there is a lack of transparency for medical scheme beneficiaries, particularly in matters pertaining to medical scheme benefit options. Inefficiencies in the health market, such as unequal or incomplete information, are likely to impact premiums and lead to suboptimal decisions by consumers when considering their options. The policy challenge is to enable access to standardised information sets so that medical scheme beneficiaries can make optimal decisions when choosing benefit options.

This chapter investigates non-health price barriers (in this instance, the inability to choose optimally), and their impact on beneficiary benefit option choices. Emerging health economics literature was studied to ascertain the impact of these barriers in other voluntary health insurance

markets. The provision of standardised choice sets (option standardisation) was found to be a common policy remedy.

Empirical methods were applied to test the existence of non-price barriers, using data from the Council for Medical Schemes. A descriptive analysis of benefit design configurations, developed by the authors, show that selection outcomes were different across benefit designs. Specifically, community rating and solidarity were not the same across benefit designs. More importantly, the results of both supervised (discriminant analysis) and unsupervised (cluster analysis) market segmentation analyses suggested that beneficiaries were confused by too many benefit options; that choice sets facing different beneficiaries were not the same; and that information was not equally accessible (some beneficiaries may make decisions with incomplete information).

i Council for Medical Schemes

ii Department of Economics, University of Pretoria

Introduction

The Council for Medical Schemes (CMS) is the regulator of the medical schemes industry in South Africa. The Medical Schemes Act (No. 131 of 1998)¹ regulates the industry in the interests of medical scheme beneficiaries. Beneficiary interests can be gauged by the frequently asked questions on the CMS website, which relate to how to choose an appropriate medical scheme and benefit option.

The proliferation of benefit options led to market fragmentation, which was identified as a policy issue in the National Health Insurance White Paper.² The White Paper took issue with market fragmentation as it impedes beneficiaries' ability to determine prices on the supply-side, and hampers the achievement of economies of scale. For example, the proliferation of benefit options means that beneficiary decisions become more complex, efficient price allocation (purchasing decisions) become less obvious, and appropriate cover is less easily accessed/achieved.

This chapter describes the extent of option proliferation, and the outcomes of beneficiary benefit option choices, in both open and restricted schemes. Empirical evidence is provided showing barriers to the ability of beneficiaries to make optimal benefit decisions, other than decisions on price, utilisation cost, and health enrolment profiles. There is a need to understand the possible behavioural factors not captured on our models that may explain the observations here related to healthcare utilisation and enrolment. Behavioural factors may be explained by data on the order or way that health-service items are chosen or preferred by beneficiaries or households. Recent health economics literature outlines the need to include behavioural or health-preference data to predict expected healthcare costs.^{3,4} However, such data could not be included because they are not in the public domain.

The chapter also makes a case for health information systems (HISs) that provide decision-support tools for health information exchange (HIE). A recommendation is made for the sequencing of policy remedies to deal with adverse policy outcomes. Finally, the chapter contributes to the literature on the beneficial impact that HISs have had on health-system strengthening.⁵ Since health information systems are one of the critical components of the building blocks of health system strengthening, they are elaborated on below and examples are given of the policy issues they may assist in alleviating.

Alleviating choice complexity through HIE

Health information exchanges have been widely used in the United States (US) to provide health information decision-support platforms for beneficiaries to make better health

plan choices. In the Netherlands, information systems are used to disseminate knowledge about the quality of health interventions purchased by health funds.

The Competition Commission's Health Market Inquiry (HMI)⁶ has made provisional recommendations on issues affecting the efficient operation of the market in the private health industry. The HMI has concerns about the transparency and proliferation of medical scheme benefit options. It found that there are too many options, which complicates decision-making for beneficiaries as it makes it difficult for them to distinguish between benefit options.

The difficulty experienced in choosing health insurance plans has been documented in the literature described in this paragraph. Health insurance consumers are not able to make optimal decisions in purchasing cover, especially when there are too many options available.^{4,7,8} In some instances, irrational or inconsistent decisions were made, when alternatives were not reduced to manageable and simple options.⁹ On other occasions, health insurance consumers had different cover from what they stated would have been most optimal in health insurance household surveys.⁷ Wide variation in health insurance premiums were found for health plans with similar benefits.¹⁰ Some health economists have found standard models to be inadequate, i.e. those that describe enrolment as being determined only by utilisation costs and premium mark-ups. Instead, they suggest that behavioural models are far more reliable.^{3,4,11-13} Selection problems can further confound beneficiary ability to realise their preferred level of health utilisation. This confounding also impacts health fund ability to estimate expected utilisation costs reliably. Providing consumers with a common set of decision-making tools and information is critical.^{14,15} Standardisation of benefit options and provision of information are among the most commonly recommended policy remedies.

Health information exchanges

HIEs and the selection problem

Another outcome of health plan selection processes in voluntary health insurance environments is the potential for adverse selection^a and the counterpart to this, namely cherry picking.^b International research on private health insurance has found that adverse selection and cherry-picking lead to a downward spiral, an unravelling of open enrolment and community-rated health funding systems. In this scenario, people who are old or who have high-risk profiles find it difficult to remain on comprehensive health insurance. Young and healthy health fund members are covered on the cheapest options, which reduces cross-subsidisation and solidarity. Selection problems usually leave high-risk groups without affordable health cover, which negatively affects beneficiaries; however, such consequences can be mitigated through risk-equalisation.

a Adverse selection: the risk profile is covered in the wrong risk group. This is also called anti-selection or self-selection.

b Cherry picking: strategy employed by insurers to attract preferable risk profiles for cover.

Emerging health economics research suggests a sequenced ordering of policy interventions.⁴ The implementation of risk equalisation requires a carefully thought-out policy mix; on its own, it is an imperfect tool for eradicating cherry-picking. A policy mix would include the standardisation of benefit options and establishment of HIEs, with common information sets for health insurance enrolees. This is because all beneficiaries should have the same information in order to strengthen market stability and not create market uncertainty, as beneficiaries respond to market or regulatory changes. If benefit options are not standardised, well-intentioned policy initiatives will not be supported by the market-disciplining allocations of informed beneficiary decisions. Implementing mandatory cover and risk equalisation under such market conditions may lead to unintended policy outcomes.

HIEs, option standardisation and risk equalisation

The regulator of medical schemes has often been criticised for not implementing risk equalisation.⁶ On the other hand, risk equalisation should not cross-subsidise what the HMI⁶ findings identified as factors behind the perverse market outcomes of the private health financing sector. Factors contributing to such inefficiencies could be non-transparency of medical schemes, and product complexity. In fact these have been identified as two of the causes underlying market inefficiencies.⁶ Therefore, under current market circumstances, risk equalisation may cross-subsidise market inefficiencies.

Some international experience suggests that without option standardisation, risk equalisation has not been able to stop cherry-picking.¹⁶ If funders offer supplementary benefits that are risk rated, some funders will be able to cherry-pick enrolees for both the essential benefits package and the supplementary package.¹⁶ Ericson and Sydnor evaluated the impact of imperfect health plan selection (adverse selection and cherry-picking) arising from extensive benefit option choices.⁴ They identified policy remedies and concluded that without some standardisation of benefit options, risk equalisation is an imperfect policy solution. Withagen-Koster et al.¹⁷ found that health utilisation is not fully explained by health-utilisation estimation models. Residual health utilisation was explained by consumer preferences solicited from a household health expenditure survey. They concluded that risk-equalisation models should incorporate economic behaviour. van de Ven and Ellis also described market power and preferences as factors impacting healthcare utilisation.¹⁸ Ultimately, the absence of optimal consumer choice when selecting benefit options may impact negatively on initiatives to subsidise legitimate health needs and factors associated with socio-economic deprivation.

HIEs and managed competition

If beneficiaries are given information on the performance of disease-management programmes and networks contracted to their selected benefit options, their decisions will be

simplified as they will be able to compare the efficiencies of services they access through their benefit options. Enthoven, for example, speaks of managed competition on the demand-side in order to actively monitor and evaluate quality outcomes on the supply-side (provider market).¹⁹ van Ginneken and associates state that Europe has learned that “managed competition among health plans by itself will not substantially drive down health costs”.¹⁶ That is, interventions cannot only be made on the demand-side.

To allow managed competition to have an impact on the supply-side (health provider contracting), the Dutch Health Authority publishes an annual health quality performance report on the performance of the entire health system.^{20,21} Included in the report are health access indicators, which capture the responsiveness of the authorities to equality-related issues. The provision of health-provider and health-fund-performance indicators on the HIE should allow beneficiaries to evaluate the quality they receive from their benefit options.

Generally, the cited literature suggests that HIS can empower policy initiatives aimed at health-system strengthening. Health information systems include enabling tools that support optimal consumer health plan choice. Beneficiaries need these tools to identify quality and cost-effective alternatives and to access affordable and effective health care.

The rest of the chapter provides an overview of the decision environment faced by medical scheme beneficiaries and comments on the impact that benefit option proliferation has on solidarity and choice complexity. The chapter provides a standardisation policy framework that could potentially make benefit option decisions less confusing, and make value more perceptible to beneficiaries. This solution should be rolled out on an HIE decision-support platform.

Methods

Population and data source

The analysis was conducted at the benefit option level. The information available covers 271 of the 277 benefit options registered with the CMS at 31 March 2014 (i.e. 98% of the benefit options), 137 in the open schemes and 134 in the restricted schemes, respectively²² (not counting efficiency discounted options). The data reported for 2018 cover 89% of the 136 benefit options registered in March 2018, in the open schemes market. In terms of restricted schemes, the analysis covers 88% of the 135 options registered in March 2018.

Data on the benefit content of the options were sourced from the registered rules of medical schemes lodged at the Registrar for Medical Schemes’ Office.²³ The data represent the scheme rules registered for the 2015 and 2018 benefit

years. The options were classified in 2015. No further work on coding classification has occurred since then. Therefore, the 2018 classification of benefit option designs assumes that most benefit options have continued operating with the same benefit structures since 2015. Demographic and financial data at the option level were sourced from the annexures of the CMS Annual Reports published in 2015²² and 2019,²⁴ which are available on the CMS website.

Benefit option classification

The methodology for classifying benefit options is based on work previously conducted by the CMS in 2008.²⁵ The methodology used in this analysis extends to this work by using health service consumption bundles.

Classification 1

Table 1 describes benefit design classifications, which were developed by categorising the annual benefit entitlements submitted to the CMS for registration. This classification table shows scheme benefit option rules registered on 31 March 2014.²² Numerous dimensions inform the configuration of a benefit option. For the purposes of this study, benefit options were limited to 12 benefit design categories (Table 1).

Classification 2

Table 2 summarises a revised benefit design structure that could be made available to members. The benefit options were allocated to three benefit design classifications from the previous list of 12 benefit designs (see Table 1, excluding PMB exempt options in registered bargaining council schemes).

Classification was carried out via supervised learning, discriminant analysis, and unsupervised learning, cluster analysis. The supervised process^c involved pre-determining the benefit designs and asking the discriminant analysis model to confirm the classifications. The unsupervised^d process involved simply asking the cluster analysis to group benefit options into clusters without any human intervention or judgement. Both models predicted three groups of benefit designs, labelled here as: hospital plans (HPs), partial cover plans (PCPs); and comprehensive cover plans (CCPs) (Table 2).

Variables

Table 3 shows the list of variables used in the cluster and discriminant analyses.

Table 1: Medical scheme benefit design classification, South Africa, 2014 - 2015

Benefit design name	Benefit description
No PMB Benefits	Exempt from PMBs
PMB Plans	Only PMBs & CDLs; no OOH benefits
Hospital Plans	Supplementary in hospital benefits relative to PMB; no OOH benefits
Traditional Plan 1	Comprehensive cover of OOH benefits; all risk cover
Traditional Plan 2	Partial cover of OOH benefits; all risk cover
Network Plan 1	Partial cover of OOH benefits at DSP; all risk cover
Network Plan 2	Comprehensive cover of OOH benefits at DSP; all risk cover
New Generation Plan 1	No cover for OOH benefits from risk; savings account and no ATB
New Generation Plan 2	Partial cover for OOH benefits from risk; savings account and no ATB
New Generation Plan 3	Comprehensive cover for OOH benefits from risk; savings account and no ATB
Threshold Plan 1	Cover of OOH benefits from risk after Threshold; risk ceiling after ATB
Threshold Plan 2	Cover of OOH benefits from risk after Threshold; no risk ceiling after ATB

Note: extensive list of option classifications.

ATB = above threshold benefits; CDL = chronic disease list; DSPs = designated service providers; OOH = out of hospital; PMBs = prescribed minimum benefits (diagnosis treatment pairs).

c Supervised option classification was used when conducting a discriminant analysis.

d Unsupervised classification was used when conducting a cluster analysis.

Key findings

Results

Figure 1 shows a total of 137 benefit options in the open scheme, as at 31 March 2014. Figure 1 also shows how beneficiaries self-selected themselves into 121 options and their benefit designs, as at March 2018. Figure 2 shows the extent/degree of solidarity enjoyed by open scheme beneficiaries, in 2014 and 2018 respectively. Figure 3 reflects the different degrees of risk severity (community rate/risk profile) associated with benefit designs in open schemes, for 2014 and 2018.

Collectively, Figures 1 - 3 show that benefit designs with relatively lower community rates were associated with larger risk pools and fewer options to choose from. The opposite was true for benefit designs with relatively higher levels of risk severity. For example, New Generation 1 Plans had relatively high levels of solidarity and relatively low levels of severity, and Traditional 1 Plans had relatively lower levels of solidarity and high levels of severity. The selection process yielded favourable solidarity for specific types of risk. The greater the number of benefit options for a benefit design, the lower the solidarity and relatively higher the community rate.

Figures 4, 5 and 6 illustrate the outcome of selection processes in the restricted schemes. Results were different from those in the open market scheme. There is evidence that restricted schemes have not left high-risk individuals in small risk pools. Thus, restricted schemes incorporate some degree of solidarity, which is consistent with the experience of employment group plans relative to individual insurance in the US.¹² Relatively higher risk profiles in open schemes could benefit from option standardisation and access to HIS platforms that provide health information and decision-support tools.

Table 2: Revised medical scheme benefit design classification, South Africa, 2014 - 2015

Old benefit design classification	New benefit design classification
Hospital Plans	Hospital Plans
New Generation Plan 1	Hospital Plans
Traditional Plan 1	Comprehensive Plans
Network Plan 2	Comprehensive Plans
New Generation Plan 3	Comprehensive Plans
Threshold Plan 1	Comprehensive Plans
Threshold Plan 2	Comprehensive Plans
Traditional Plan 2	Partial Cover Plans
Network Plan 1	Partial Cover Plans
New Generation Plan 2	Partial Cover Plans

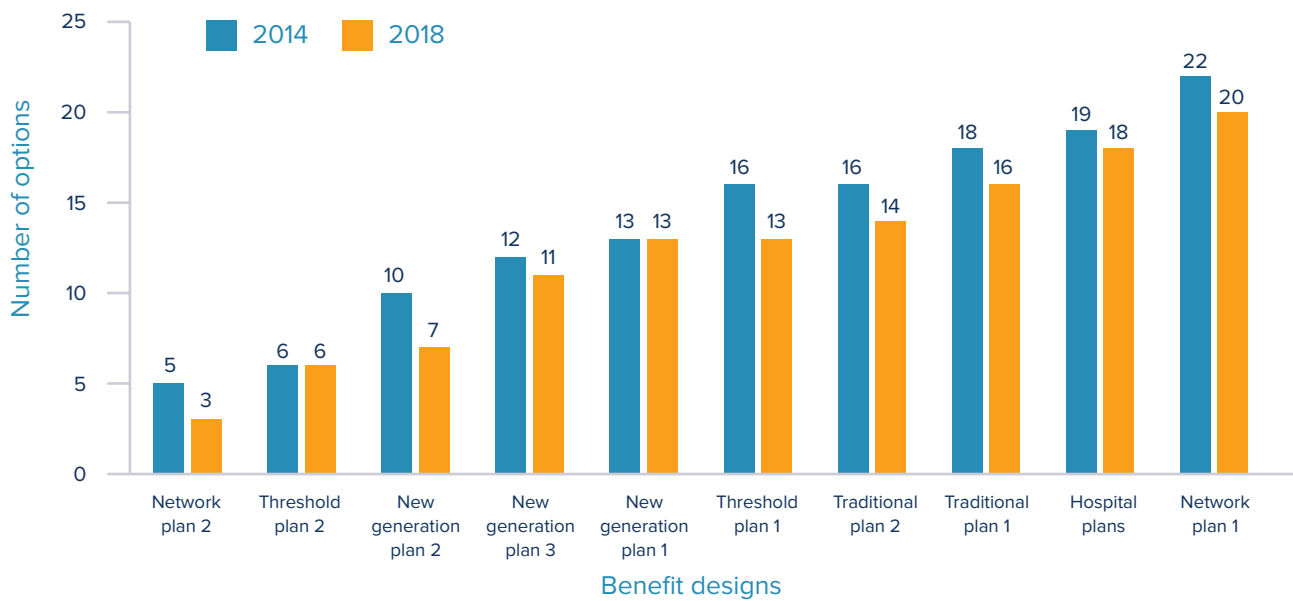
Note: Collapsed list of option classifications.

Table 3: List of independent variables for analysis model

List of variables	Description
Average_age_pb	Average age per beneficiary per annum for beneficiaries on a benefit option
Pensioner_ratio	The percentage of pensioners relative to total beneficiaries on a benefit option
Community_Rate	The expected cost of PMBs per beneficiary on a benefit option
NRHE_pbpmm	Net relevant healthcare expenditure per beneficiary per month on a benefit option
RCI_pbpmm	Risk contribution income per beneficiary per month on a benefit option
Premium_2014_fam	Family premium for 2014 on a benefit option, the premium is based on a family of three

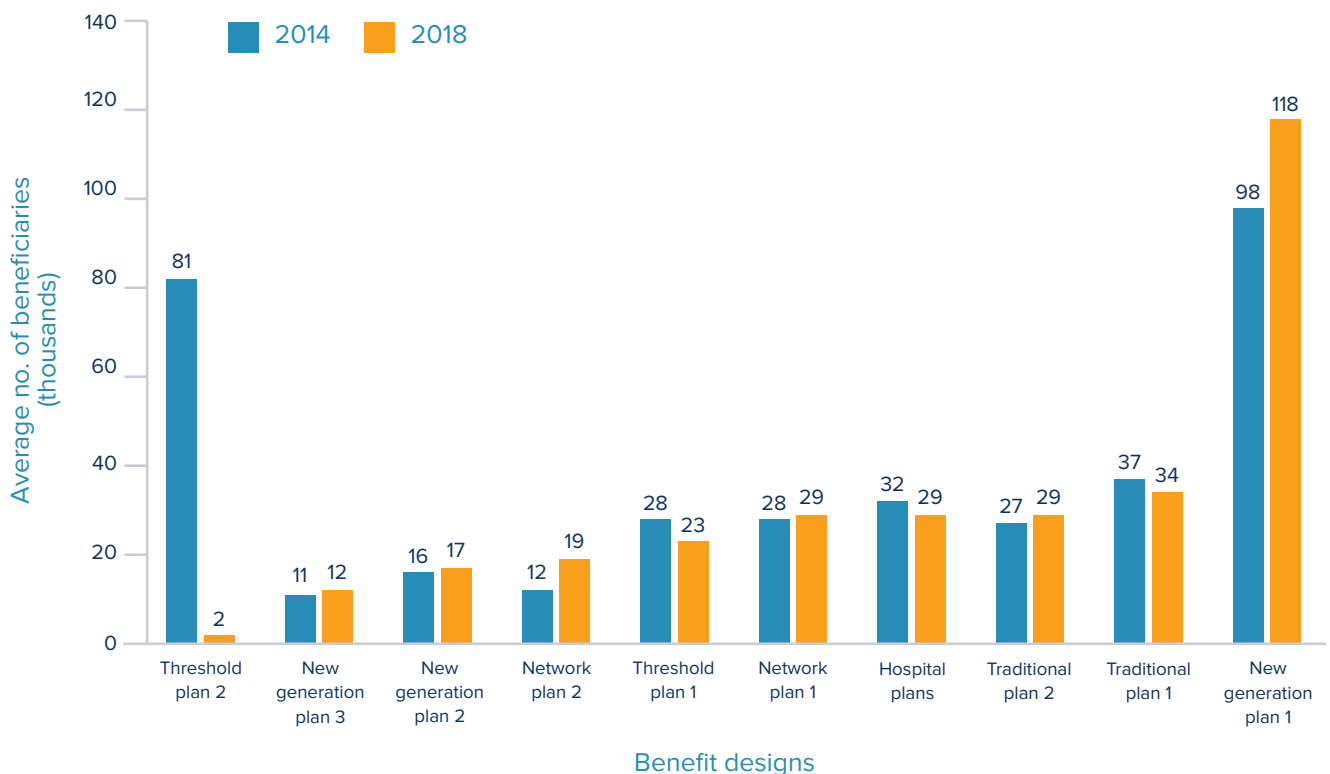
PMB = Prescribed Minimum Benefit.

Figure 1: Open medical schemes – number of benefit options by benefit design, South Africa, 2014 v. 2018



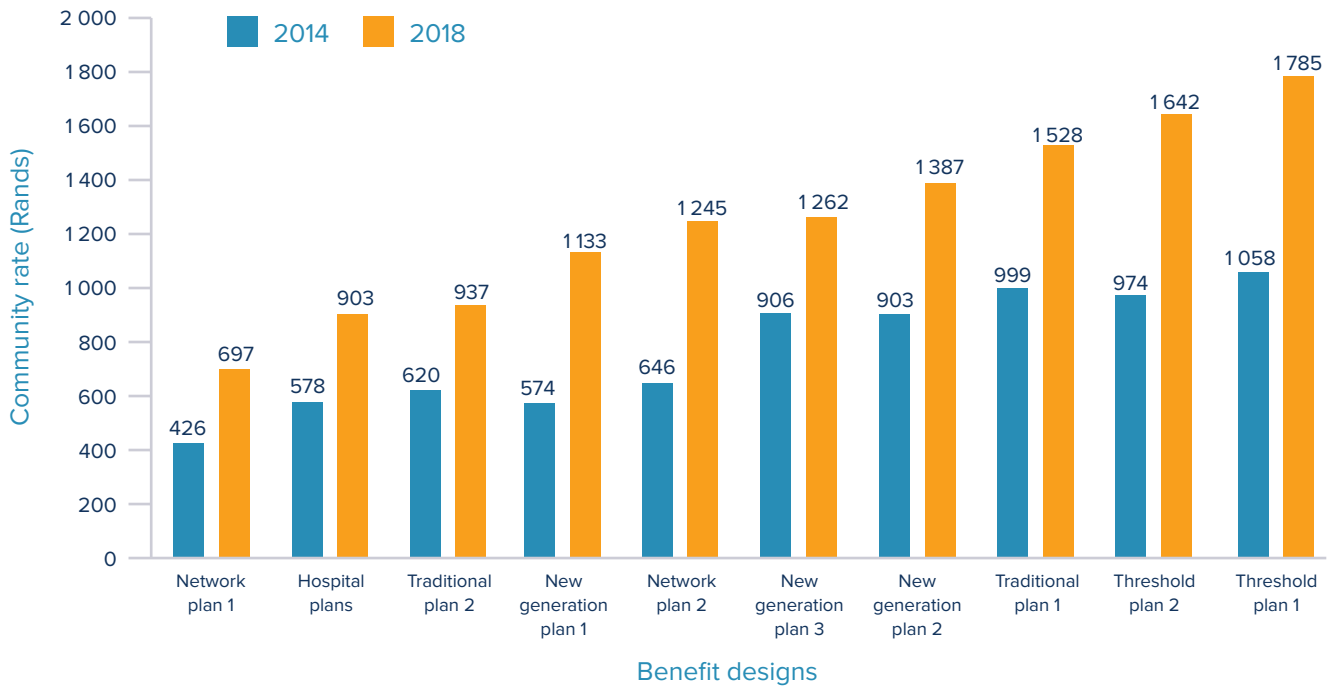
Data source: CMS, 2015;²³ CMS, 2019.²⁴

Figure 2: Open medical schemes – average number of beneficiaries by benefit design, South Africa, 2014 v. 2018



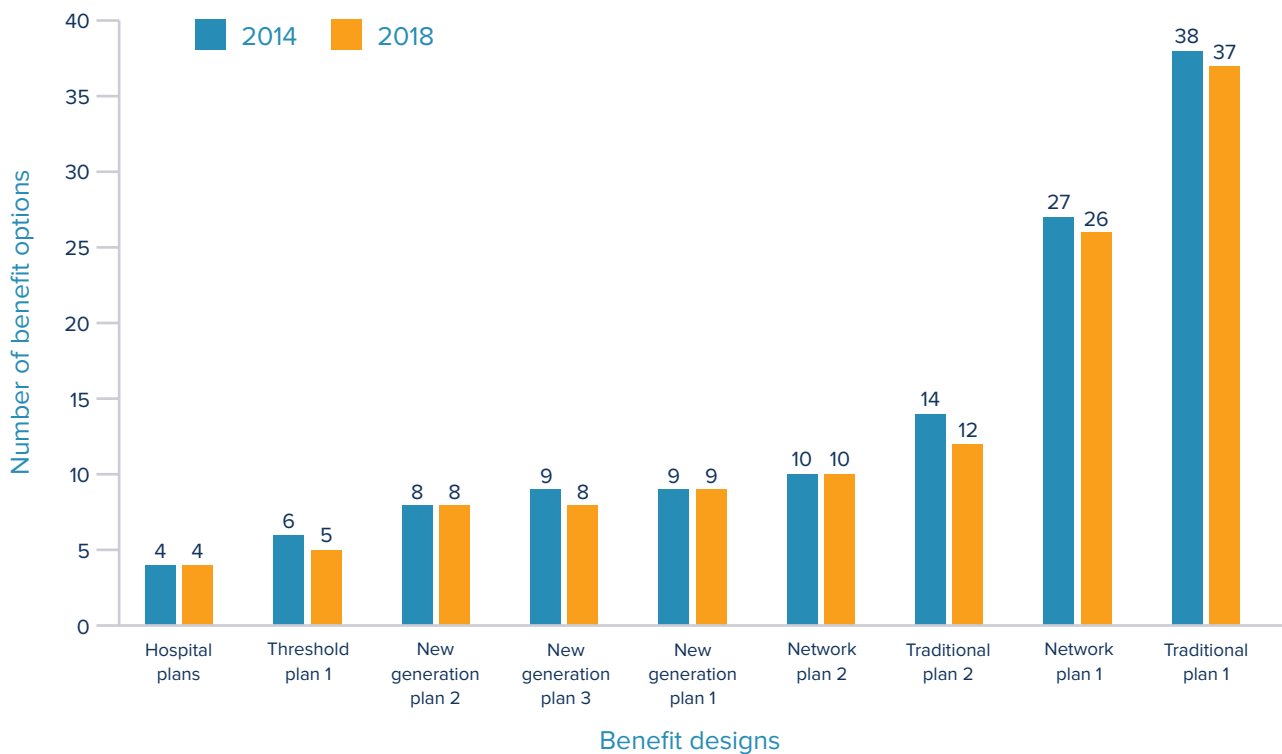
Data source: CMS, 2015;²³ CMS, 2019.²⁴

Figure 3: Open medical schemes – community rate by benefit design, South Africa, 2014



Data source: CMS, 2015;²³ CMS, 2019.²⁴

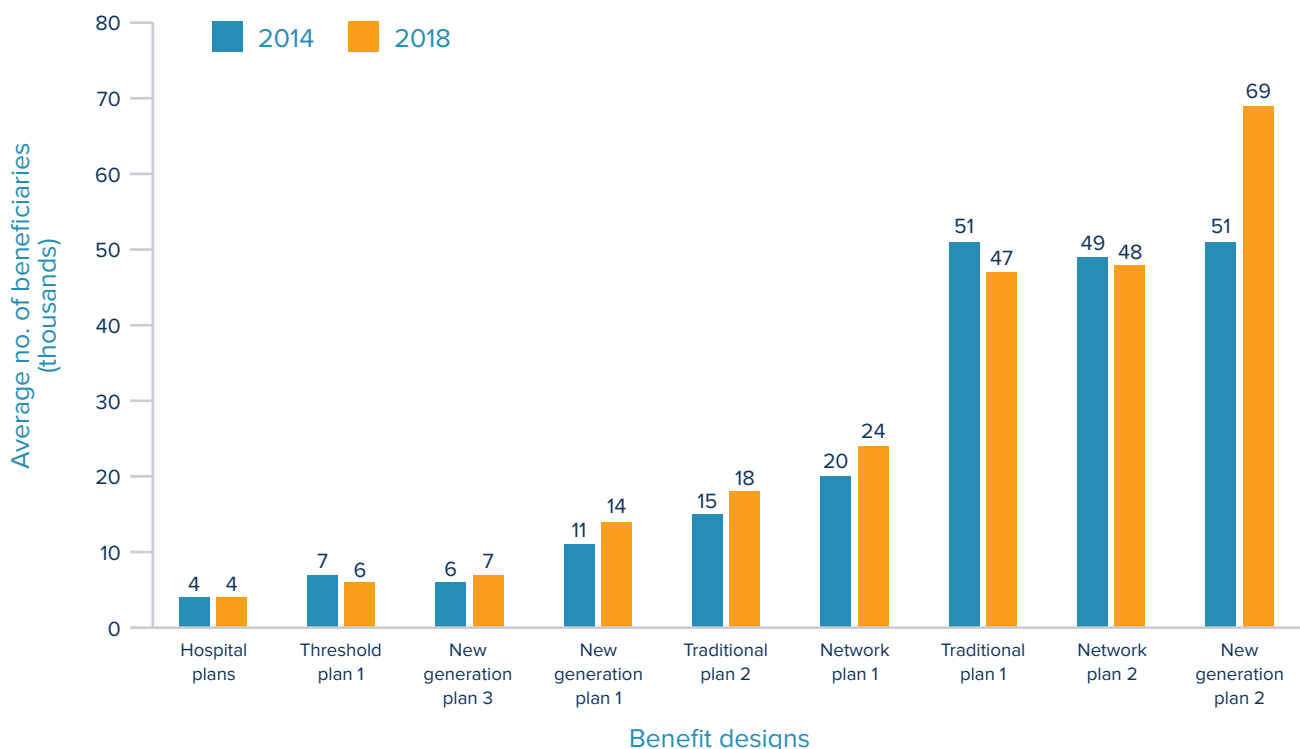
Figure 4: Restricted medical schemes – number of benefit options by benefit design, South Africa, 2014 v. 2018



Data source: CMS, 2015;²³ CMS, 2019.²⁴

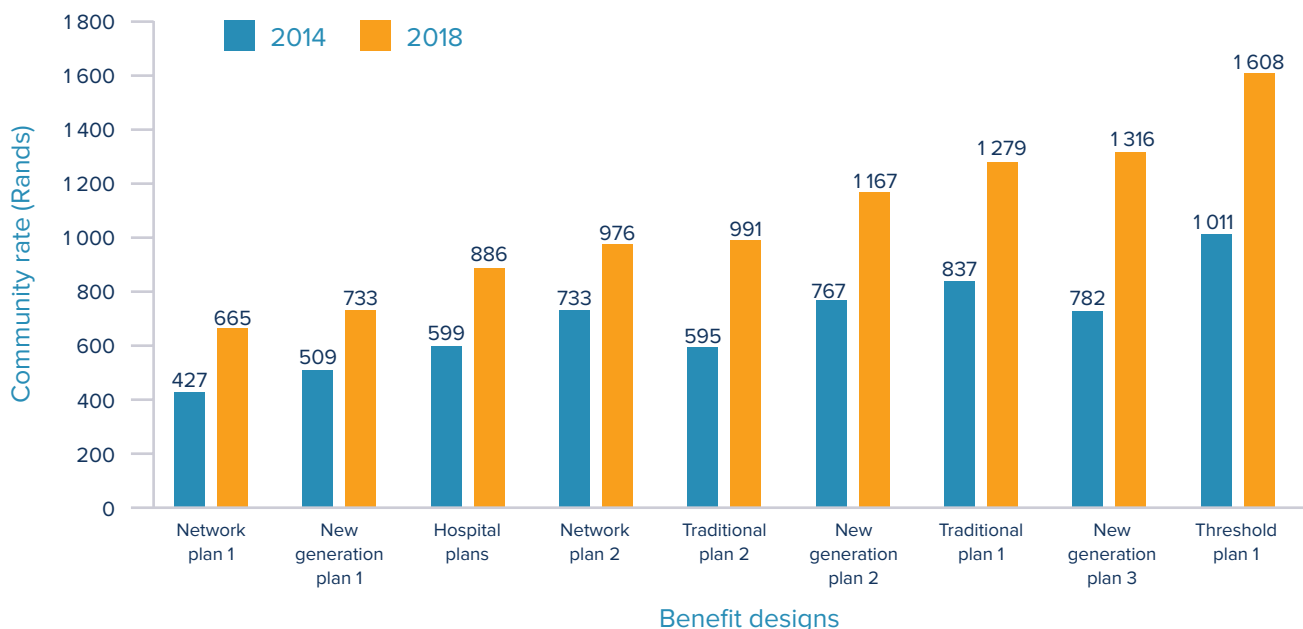
Note: These option classifications are based on Classification 1 (see Table 1).

Figure 5: Restricted medical schemes – average number of beneficiaries by benefit design, South Africa, 2014 v. 2018



Data source: CMS, 2015;²³ CMS, 2019.²⁴

Figure 6 : Restricted medical schemes – community rate by benefit design, South Africa, 2014 v. 2018



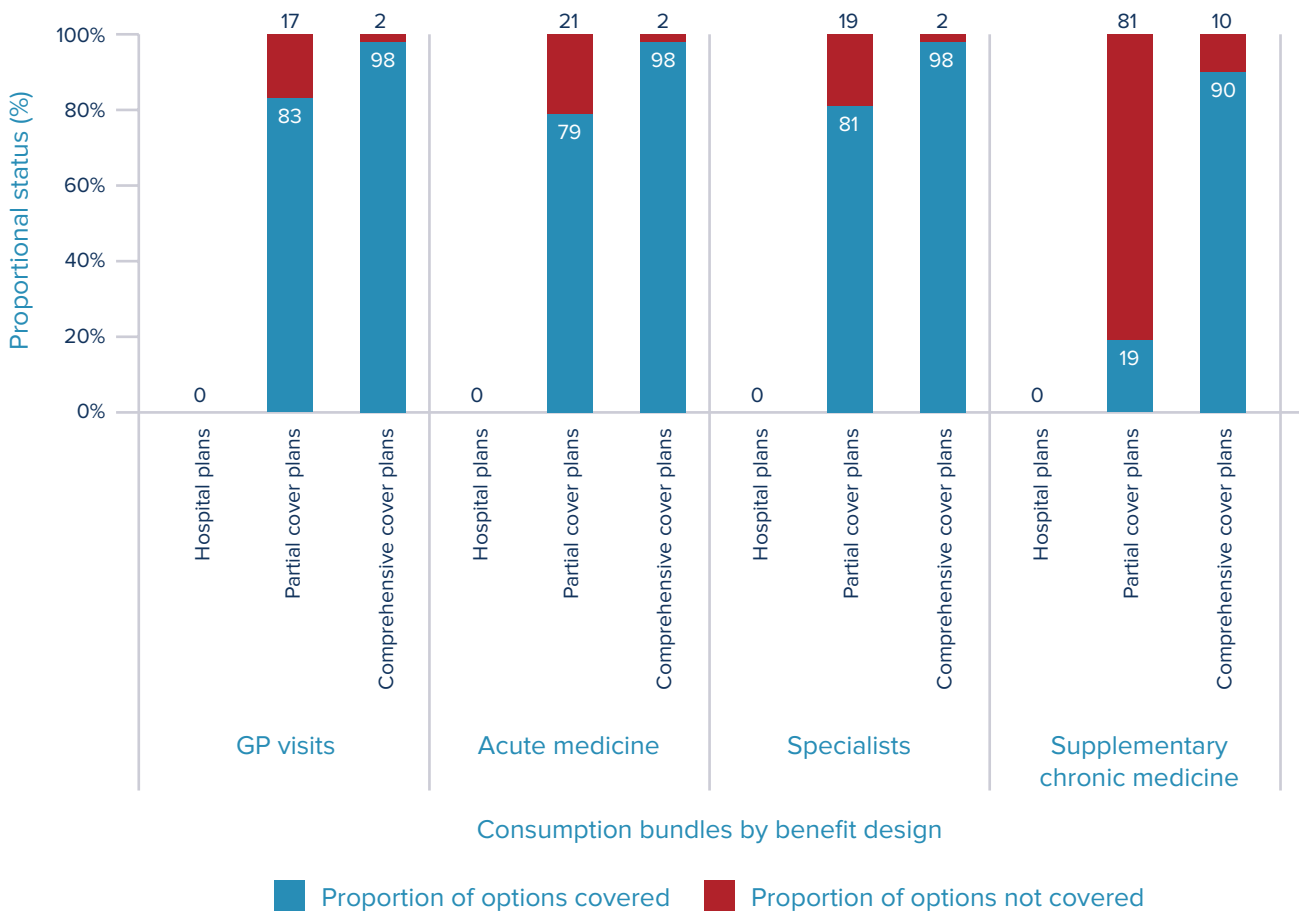
Data source: CMS, 2015;²³ CMS, 2019.²⁴

Figure 7 shows the extent to which supplementary out-of-hospital (OOH) health services were covered by the different benefit designs. The actuarial claims levels were not standardised, and only the scope of health services was considered.

Effectively, in terms of health services: if a benefit was covered in a benefit design, at least 79% of the options would cover that OOH benefit; and if a benefit was not covered in a benefit option, at most it would not be covered by 21% of the benefit options in that benefit design.

Figure 8 shows the average number of beneficiaries (solidarity) per benefit option for each benefit design. Figure 9 shows the community rate (risk severity) for benefit options within each of the benefit design groups. A comparative analysis of the two Figures (8 and 9) was consistent with analyses based on 11 benefit designs in the open schemes. There was less solidarity for CCPs (comprehensive cover) than for PCPs (partial cover). Beneficiaries on CCPs were spread across a larger number of benefit designs than beneficiaries on PCPs. The selection processes experienced by these two groups were different, based on the availability of benefit options in the open schemes environment.

Figure 7: Out-of-hospital benefits by medical scheme benefit design, South Africa, 2014 - 2015



Note: These option groupings are based on classification 2 (see Table 2).

Figure 8: New classification – average number of beneficiaries by medical scheme benefit design, South Africa, 2014 v. 2018

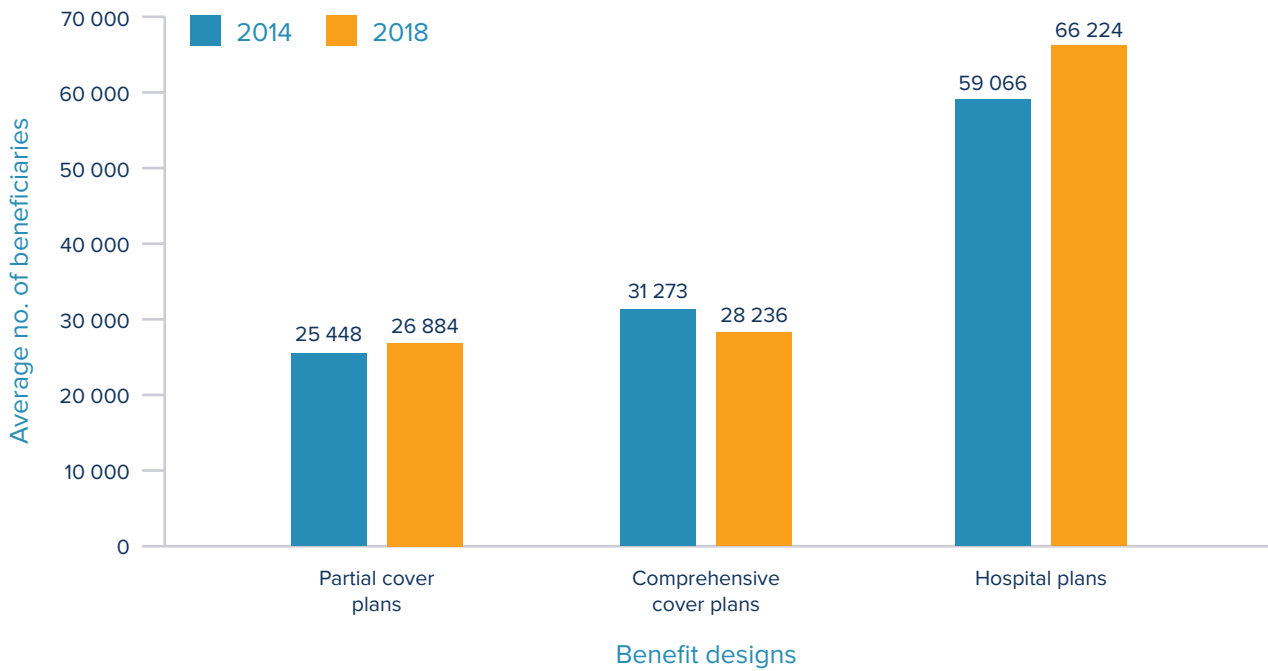


Figure 9 : New classification – community rates by open medical scheme benefit designs, South Africa, 2014 v. 2018

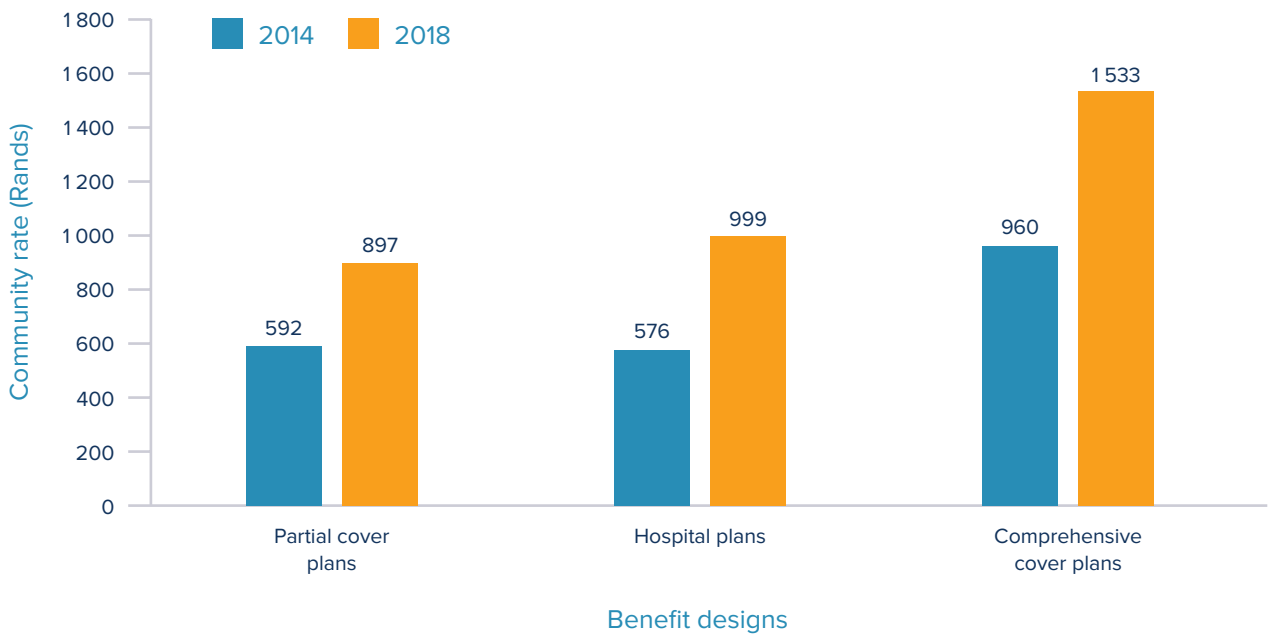


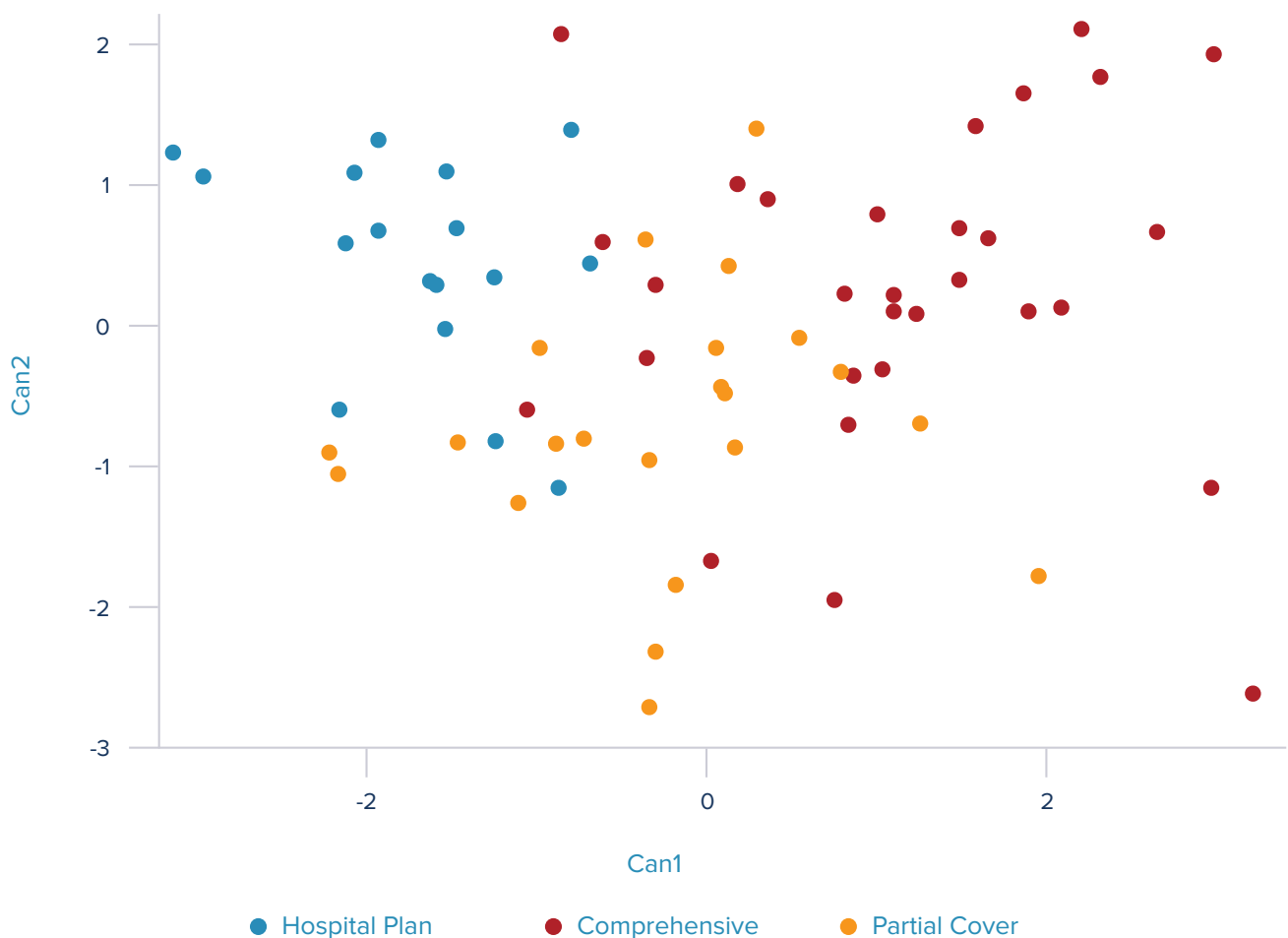
Figure 10 reflects the findings of the discriminant analysis. Interpretation of the results suggests the following:

- The CCPs (labelled comprehensive) are on the extreme right of the plot (meaning their location confirms their similarity); however, these options are widely distributed, thus there is still some confusion or ambiguity associated with the purchasing decision;
- The PCPs (labelled partial cover) are in the centre (middle) of the plot; however, these options are also widely distributed; and
- The HPs (labelled hospital plan) are on the left of the plot, and widely distributed.

The wide dispersion of observations within a benefit design classification (Figure 10) suggests that although the benefit content was similar across options in a benefit design, the observed behaviour patterns were different among benefit options within a benefit design classification. As such, there may have been some confusion among beneficiaries.

Figure 11 shows that in the 2018 benefit year, the degree of intra-class variation in open schemes was still wide for benefit options with similar characteristics. Much like in 2014 (Figure 10), beneficiaries may be faced with confusion resulting from too many options to choose from.

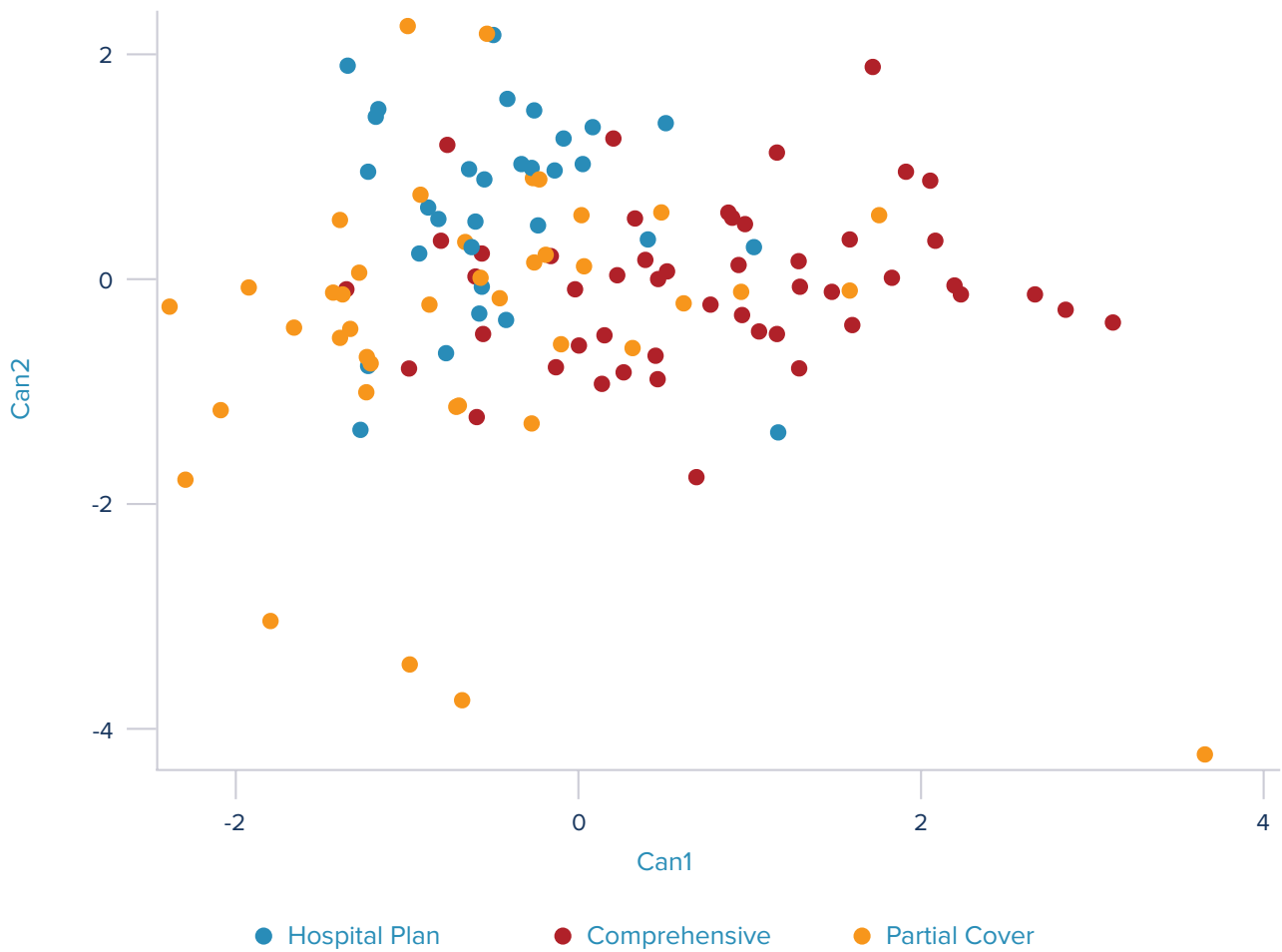
Figure 10: Plot of open medical scheme benefit designs using discriminant analysis, South Africa, 2014



Generated in SAS 9.4.

Note: Can1 and Can2 are canonical variates showing the covariance between independent variables that best explain differences between benefit option designs, namely: hospital plans, partial cover plans, and comprehensive cover plans.

Figure 11 : Plot of open medical scheme benefit designs using discriminant analysis, South Africa, 2018



Generated in SAS 9.4.

Note: Can1 and Can2 are canonical variates showing the covariance between independent variables that best explain differences between benefit option designs, namely: hospital plans, partial cover plans, and comprehensive cover plans.

Figure 12 reflects the results of the cluster analysis. Although this analysis was unsupervised, the model suggests that there were three types of benefit options in the open schemes. That said, the identified clusters do not form compact groups at all, which suggests that people were either confused and not able to distinguish between benefit option designs, or they were not making decisions based on common information sets.

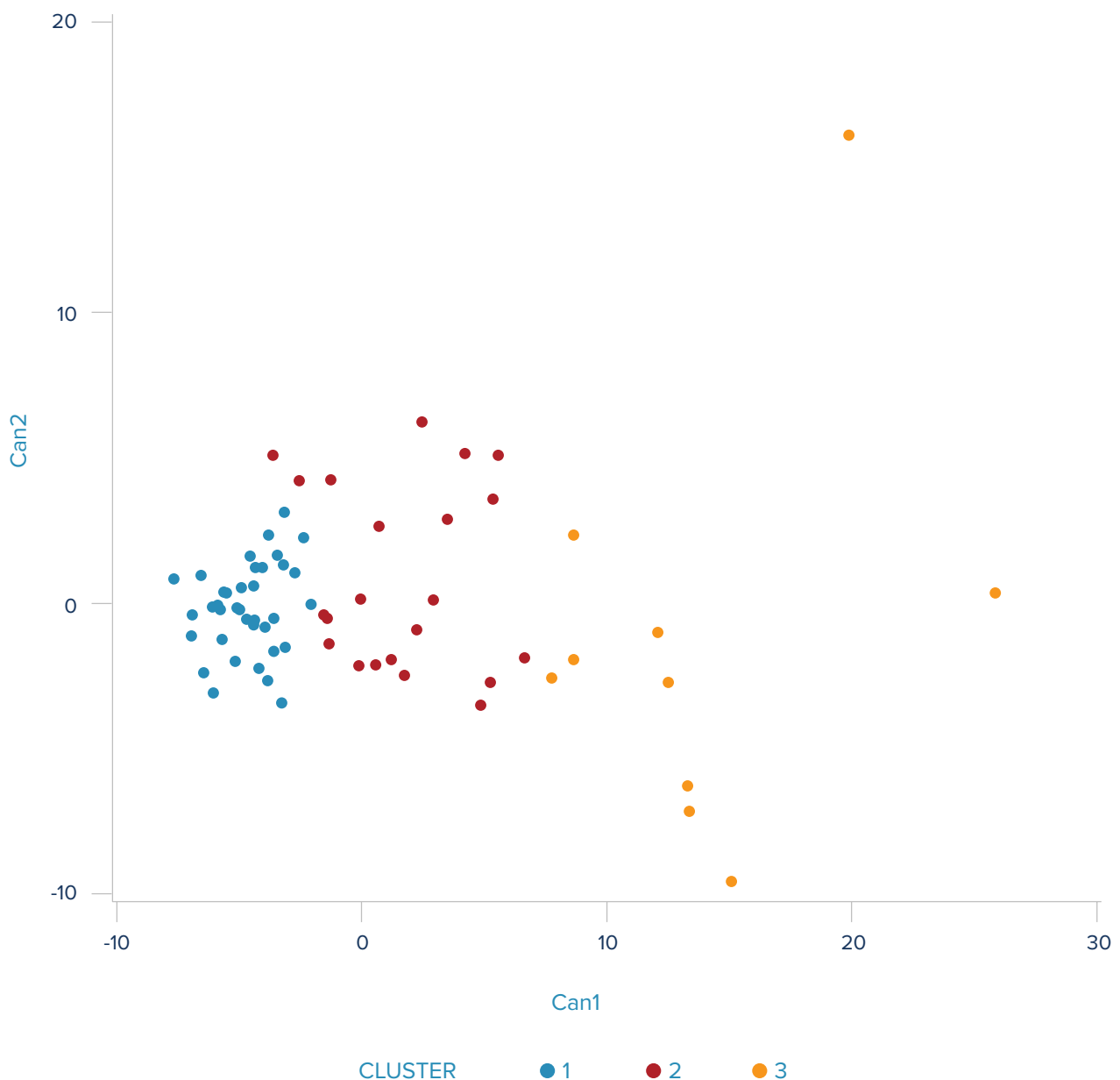
The results from Figures 10 to 12 should be interpreted with caution as: the data used as determinant variables were limited to financial performance and age/sex data; no data were included on stated preferences (behavioural

assertions associated with likely taste preferences, except for revealed purchases); no socio-economic information was collected; and the data were aggregated and as such do not include other information that might have helped to explain individual choice. This means that there is misspecification in the model; conducting a market segmentation survey is likely to rectify this.

Significance of the findings

What is most significant from the analysis is that beneficiaries are making benefit option choices from options with similar benefit structures, yet consumption behaviour within similar choice alternatives yields variant

Figure 12: Cluster plot of open medical scheme benefit designs, South Africa, 2014



Generated in SAS 9.4.

Note: Can1 and Can2 are canonical variates showing the covariance between independent variables that best explain differences between benefit option designs, namely: hospital plans, partial cover plans, and comprehensive cover plans.

outcomes that make benefit designs seem more dissimilar than expected. Alternatively, it seems that products within common benefit design groupings (having similar health service consumption bundles), do not seem to be perceived to be the same by beneficiaries. The choice environment for beneficiaries seems to be somewhat fuzzy, and therefore may not lend itself to optimal decision outcomes. For example, there are large intra-group variances in the cluster analysis results. The complexity of the decision environment has been mentioned in the provisional findings of the HMI,⁶ and subsequently made firm by the recent final recommendations and findings.²⁶

Another pertinent finding, particularly in open scheme options, is that beneficiaries with relatively lower community rates^e enjoy a relatively higher degree of solidarity (risk pool size) than beneficiaries with relatively higher community rates. The profiles with lower health risk severity are also covered on benefit designs with relatively fewer benefit options to choose from. Thus, option choices are likely to be more satisfying and easier for people with relatively lower-risk profiles, than for those with relatively high-risk profiles (i.e. risk profiles with health co-morbidities).

If the most ill members of the community are not able to make optimal choices to finance health-maintenance interventions, then their health costs are likely to occur at the most financially catastrophic healthcare levels of intervention. This cannot aid the achievement of cost-effective healthcare outcomes for the healthcare system. A report by the World Bank makes it clear that even with risk equalisation, efficient outcomes cannot be achieved.²⁷ The report explains that a health insurance environment with incomplete information makes the problem even worse. Beneficiaries who are more ill seem to have incomplete information.

Conclusions

Drawing on the literature, this chapter outlined the selection problems endemic to private voluntary health insurance environments. Using that as a background, data were extracted from the CMS to empirically assess the relevance of the selection problem in the South African private health financing system. Much like in the individual health insurance market in the US, data from the open medical scheme market show that there are selection problems, which impact negatively on the welfare of vulnerable groups.

The reason for this is twofold. Firstly, benefit option decisions are difficult for consumers due to the proliferation of benefit options in the open medical schemes sector. The numerous dimensions used to configure utilisation rationing mechanisms, such as co-payments, levies and deductibles, also add confusion to the decision-making

process. Secondly, risk groups that are likely to purchase comprehensive health care find themselves on options with relatively less solidarity than hospital and partial cover plans, as seen in the greater levels of solidarity attained on other benefit design options.

The literature on consumer decisions when purchasing health plans advocates for the use of behavioural models. The latter have been shown to increase understanding of healthcare expenditure. The emerging message in the literature is that selection issues can be identified more clearly in experiments or detailed healthcare expenditure data.

Health-information-system-driven HIEs are useful in providing relevant and standardised information for health plan beneficiaries to optimise their healthcare decisions. A common view in the literature is that HIE is important for the design of responsive healthcare policy. For example, risk-equalisation should not be implemented without concerted effort to implement managed competition, because on its own risk-equalisation has not been able to stifle risk-selection practices. In those instances, vulnerable groups have found it difficult to retain adequate cover.

Concerning the supply-side, HIE should provide information on re-imburement contracts, as well as optimal arrangements for at least some set of specific risk profiles. Re-imburement contracts might cherry-pick preferential risk groups, otherwise providers may bear the risk of not being able to recoup costs.

When such data are collected, the regulator and medical schemes will be in a position to build an HIS platform that enables better decision-making – one that makes the private healthcare funding market more efficient through consumers acting on common and standardised information sets.

Recommendations

Health information exchange platforms should be made available on HIS with the architecture to support beneficiary health plan decision making. The HIS should have tools to compare the performance of healthcare interventions, such as networks and disease-management programmes. When these information sets are standardised and accessed on a HIE, consumer-directed interventions in the healthcare market can usher in the managed competition that Enthoven envisaged.¹⁹

The health policy agenda in South Africa is to have a single National Health Insurance (NHI) fund that purchases an essential minimum benefit package. Medical schemes are to dovetail their health service benefits with those of the NHI, incrementally phasing in the health service regimen to cover

e The cost of health risk severity for a benefit option.

supplementary and complementary healthcare services. There ought to be room for private-public partnerships (PPPs) to augment the administrative and financing capacity of the state with regard to long-term diseases. However, this should only be in instances where private entities have revealed their true administrative capacities; otherwise, non-profit Blue-Cross-type models should be used. Blue-Cross models are healthcare delivery arrangements that can include PPP collaborations.

During the NHI phase-in period, the architecture of the decision-support system should group health services as consumption bundles within the basket of goods offered by benefit options. In the case of non-emergency out-of-hospital services, the consumption bundles should have standardised groups covering the following categories of healthcare services: preventive; acute care; acute medicine; specialist services; and supplementary chronic medicine for non-Chronic Disease List (CDL) formulary treatment regimens.

The decision tool information sets should standardise health-finance offerings for each health-service consumption bundle across the following two dimensions: expected actuarial claims costs; and expected out-of-pocket expenditure (co-payments, savings account, levies, self-payment gaps, etc.).

The decision tool should include an optimisation simulation for current and inter-temporal expenditure. It is crucial that young people should not delay their purchase of health insurance. Optimised decisions made by consumers are probably better than expecting risk-equalisation to eradicate cherry-picking practices or selection problems. Consumers able to optimise their decisions will also vote with their feet and choose the most efficient options, thus affording natural consolidation and solidarity in the medical schemes industry.

To standardise benefit designs properly, it is essential that the CMS collaborates with medical schemes to conduct market segmentation surveys. The stated beneficiary preference order for consumption bundles will help standardise services and keep them relevant to what beneficiaries' value.

Performance outcomes from Patient Reported Experience Measure (PREM) and Patient Reported Outcome Measure (PROM) surveys could be used to rate the value derived from treatment interventions. Incorporating PREM and PROM results in HIS decision-support platforms would be a responsive policy intervention to improve beneficiary decisions, since beneficiaries would be immediately able to distinguish benefit options from a benefit design and quality perspective.

The HIS platform could probably start identifying opportunities for PPPs, possibly in funding collaborations for long-term diseases, and in provider-integrated network

plans that can be subsidised for providers working in economically deprived or underserved markets.

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Expanding breast cancer care through partnerships and innovation: experience from a South African public hospital

Authors

Lydia Cairncrossⁱ
Eugenio Panieriⁱ
David Andersonⁱⁱ
Tselane Thebeⁱⁱ
Liana Roodtⁱ
Dharshnee Chettyⁱⁱⁱ
Rufkah Gamielien^{iv}
Francois Malherbeⁱ

The number of breast cancer cases at Groote Schuur Hospital (GSH) has almost doubled over the last 18 years. The GSH breast cancer team has developed new strategies to manage increasing demands on clinical resources at the hospital.

The annual number of newly diagnosed breast cancer patients utilising the Groote Schuur Hospital breast cancer service increased from 320 in 1999 to 608 in 2017. However, breast cancer resources did not improve over the period to offset this, thus there were increasing delays in diagnosis and treatment. Concerned breast clinicians have developed a multi-pronged strategy to increase capacity for breast cancer care by decreasing mammographic and surgical waiting times and streamlining patient visits to the clinic.

The entry point to the breast cancer service is through the Breast Clinic. In the absence of a same-day radiological service, large numbers of patients had to return for a second visit after their mammogram to discuss their results. To streamline visits, a virtual telephone clinic has been established that formally contacts women on a set day and time, improving efficiency for patients and the clinic. The mammographic waiting time has been improved from 20 - 24 weeks to 6 - 8 weeks through partnering with PinkDrive, a non-profit NGO that provides an additional 100 on-site mammograms per month. Project Flamingo, a non-profit

NGO and breast cancer advocacy group has assisted in reducing breast surgery waiting times from 14 weeks to 10 weeks by providing extra theatre lists on Saturdays and public holidays. Through this project, timely cancer surgery has been provided to over 400 women.

While there are still significant delays in this service, these strategies have prevented the potential collapse of an essential clinical service. Longer-term strategies include advocating for increased funding for public health facilities, and (as exemplified in these partnerships) harnessing breast cancer campaign resources to serve populations most in need. The recent focus on cancer care by the National Department of Health, and development of the Clinical Guidelines for Breast Cancer Control and Management, represent an opportunity to plan comprehensively for sustainable and coordinated breast cancer care.

i Department of Surgery, Groote Schuur Hospital
ii Department of Radiation Oncology, Groote Schuur Hospital
iii Department of Anatomical Pathology, Groote Schuur Hospital
iv Department of Radiology, Groote Schuur Hospital

Introduction

Breast cancer is the most common cancer affecting women in the Western Cape, and a significant cause of morbidity and mortality in South Africa. It is estimated that one in 33 women in South Africa will develop breast cancer in her lifetime.¹ Few preventive measures significantly decrease the risk of breast cancer, as modifiable risk factors such as smoking, alcohol use and obesity are minor contributors to overall breast cancer risk.² However, early stage of presentation has been linked to improved survival, making early detection and appropriate treatment the most effective strategies for improving outcomes.³ In South Africa, limited breast symptom awareness⁴ and inconsistent access to good-quality efficient breast diagnostic services⁵ contribute to late-stage presentation. Delays in accessing treatment contribute further to breast cancer morbidity and mortality.

Breast cancer care pathway

Breast cancer care begins with symptom awareness and presentation to primary-level health facilities. This first step is influenced by breast cancer knowledge and the effectiveness of public-awareness campaigns. Following awareness, effective breast cancer care requires access to efficient and reliable diagnostic services involving triple assessment, namely clinical evaluation, radiological evaluation, and tissue biopsy. Surgical, radiology and pathology teams staff these aspects respectively. After diagnosis, patients require staging investigations involving radiological, biochemical and nuclear medicine investigations. A multidisciplinary team (MDT) should discuss all aspects of care, including at least radiology, surgery, oncology and pathology, and present the agreed-on treatment plan to patients. Initial treatment is usually surgery or chemotherapy,⁶ followed by radiotherapy,

endocrine therapy,⁷ and where available, targeted biological therapy. Follow up, survivorship support and palliative care involve breast care nurses, advocacy groups, breast cancer survivor networks and palliative care specialists, as shown in Figure 1.

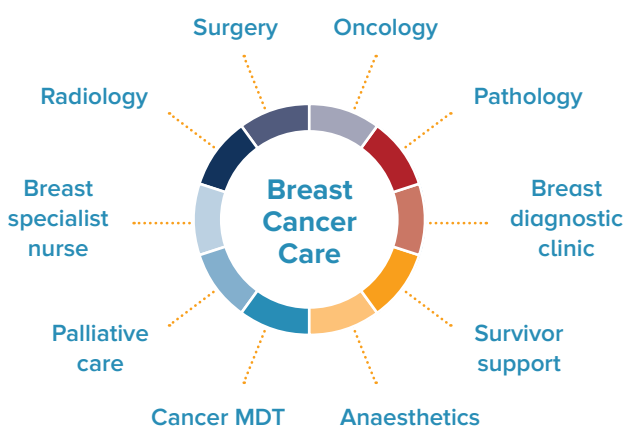
Treatment of women with breast cancer therefore involves a range of health workers engaged at different levels within the health system, from primary clinic symptom detection to tertiary hospital oncological services. Successful treatment relies on collaboration and co-ordination between all these role players. Conversely, backlogs and resource constraints at any one of these points will result in delays in the entire care pathway, with the potential to impact negatively on patient outcomes.

Groote Schuur Hospital breast cancer service

Groote Schuur Hospital (GSH) is one of two tertiary hospitals providing breast cancer care in the city of Cape Town. It serves a population of approximately two million and offers the full spectrum of breast cancer care from diagnosis to oncological and palliative care. As shown in Figure 2, over the past 18 years new breast cancer cases at GSH have almost doubled, from 320 in 1999 to 608 in 2017. This rate of increase has been most significant in the last five years, with a 25% increase between 2013 and 2017. The reasons for this rapid increase may include population growth, greater breast cancer awareness, and health migration from other parts of the country and the continent. This doubling of the clinical workload has not been matched by an increase in resources at any of the points of service delivery, resulting in significant delays in diagnosis and treatment.

The aim of this chapter is to outline some of the strategies employed by the GSH breast cancer team to manage these increasing demands in the context of fixed clinical resources, and then to consider some of the longer-term and more sustainable interventions needed to resource breast cancer care nationally.

Figure 1: Role players in Groote Schuur Hospital breast cancer care



Maintaining the service despite increasing patient numbers

Groote Schuur Hospital runs an open-access breast diagnostic clinic, the Breast Clinic (BC). This clinic sees between 120 and 150 patients weekly, of which 80 - 100 are new referrals and 40 - 50 are follow-up bookings. On average, 10 - 15 patients are diagnosed with breast cancer per clinic. The clinic is considered open access because although patients need a referral letter from a doctor or clinical nurse practitioner in the GSH catchment area, the

referring health worker does not need to follow the standard primary-secondary-tertiary referral pathway, no clinic bookings are required, and there is no restriction on access dependent on the contents of the referral letter. This system substantially decreases the time to access the clinic but also permits some filtering of patient symptoms at primary level. A trained specialist breast nurse monitors patient numbers at the clinic. Beyond a set point (usually 120 patients), the nurse assesses the urgency of referrals and either ensures that patients are seen immediately or that they get an appointment within three weeks. A team of clinicians then performs a clinical evaluation and refers patients for appropriate investigations.

At the index BC visit, breast biopsies are performed for all women aged over 25 years who have a clinically palpable breast lump, and mammography is requested for symptomatic women over 40 years. Fine needle aspiration biopsy is done in addition to core biopsies for women with suspicious breast lumps. The reason for cytology in addition to histology is to allow immediate onsite cytological assessment by a cytotechnologist. Provisional cytology results enable clinic staff to refer patients with positive cytology to an oncologist at the same clinic visit, thus reducing multiple hospital visits and permitting triaging of investigations into urgent and non-urgent streams.

In 2017, 7 536 patients were evaluated through the BC, and 608 were diagnosed with breast cancer. Figure 3 shows a snapshot of three months at the BC from January to March 2019 to provide a perspective on the resources required to run such a diagnostic clinic. Twenty-one per cent and 32% of patients needed ultrasonography and mammography respectively, and 31% required a core needle biopsy.

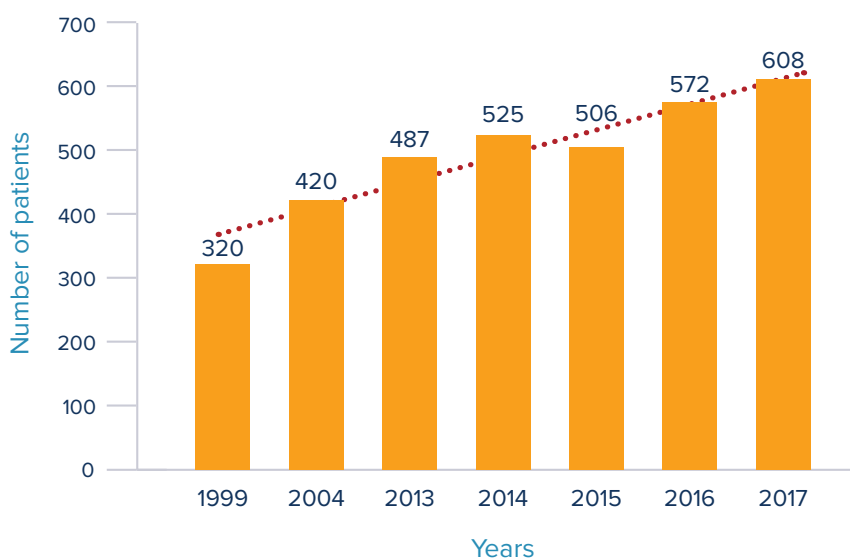
While the GSH BC runs an effective diagnostic service, it is a very busy clinic, as historically all breast diagnostic work was centralised at the tertiary hospital. The referral of women with breast symptoms to a one-stop breast-diagnostic clinic staffed by breast-trained health professionals is the international standard of care.⁸ The advantages of this model are many, particularly if the clinic also presents few barriers to access. A focused BC means that women with benign disease can be confidently evaluated and discharged by experienced staff without unnecessary investigation. Clinicians who have been trained to do breast biopsies and who perform a high volume of these procedures have an improved accuracy rate, which results in fewer repeat biopsies.⁹ On-site cytology permits same-day diagnosis for many women.

There are, however, some disadvantages to the current system. The centralisation of breast diagnostics to one hospital within the catchment area for GSH means long travel distances to the BC. There is also tremendous pressure on both the physical space and the staff at the clinic, particularly during peak attendance (October - January), following October Breast Awareness month. This fluctuation makes resource planning challenging in an open-access clinic. Finally, centralising diagnostic services may decapitate peripheral clinics in terms of the diagnosis and management of breast conditions.

To maintain the advantages of an open-access, one-stop clinic in the face of increasing numbers and static resources, clinicians have employed the following three strategies in the service:

- A satellite BC was established at Mitchells Plain Hospital (MPH).

Figure 2 : Number of new breast cancer cases managed at GSH, 1999 - 2017



Source: Annual GSH Breast Clinic Reports, 1999 - 2017.

- The number of follow-up patients was reduced and emphasis was placed on new referrals.
- A virtual telephone clinic (TC) was established.

Establishment of a satellite breast clinic

Mitchell's Plain Hospital is a relatively newly built district hospital that refers to GSH. As a new service located 30 km away, MPH was an ideal site for the establishment of a satellite BC. The aim was to establish a similar one-stop diagnostic clinic, with radiology and pathology services available on site. The clinic was started in May 2014, with the support of GSH management, National Health Laboratory Service cytotechnologists, and an NGO, PinkDrive, which provided on-site mammography. By 2017, the MPH BC had attended to 666 women with breast symptoms and diagnosed 35 women with breast cancer. The clinic continues to see between 600 and 800 patients per year.

Two key challenges were encountered in establishing a 'satellite' clinic. First was establishing a service in a facility lacking the required radiological infrastructure, primarily mammography, to complete a comprehensive patient assessment. This was circumvented by partnering with PinkDrive. While this partnership is very valuable, it remains intrinsically vulnerable to potential lack of funding or sudden loss of service and is not an ideal solution in the long term. The second challenge was 'psychological ownership' on the part of the receiving hospital with regard to the satellite clinic services.

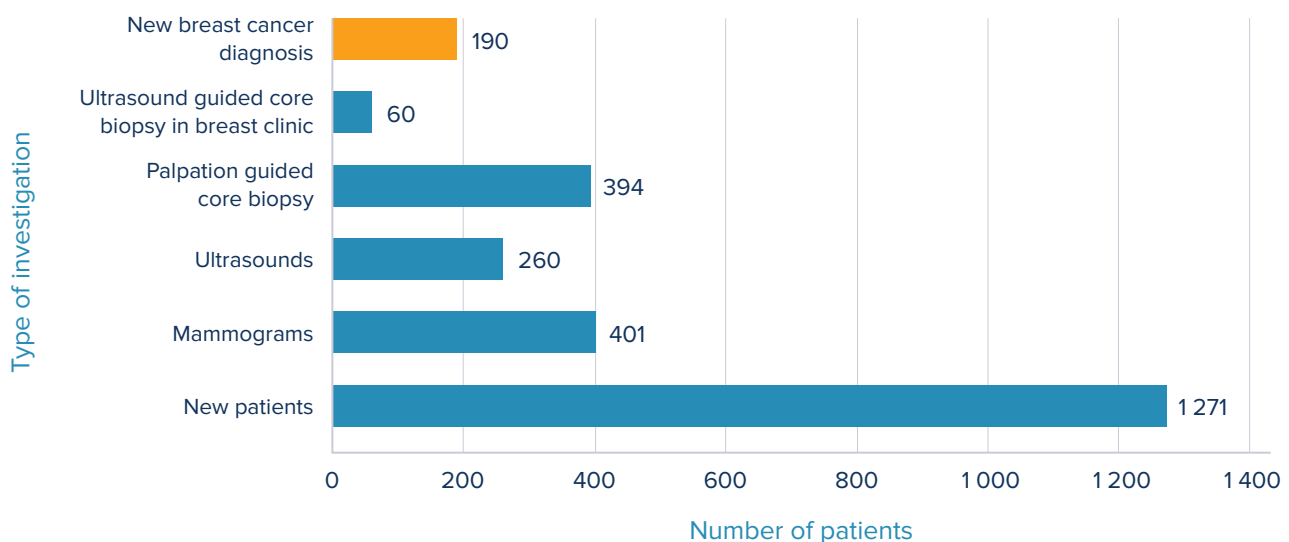
In the beginning, breast diagnosis was seen primarily as a service that GSH staff would deliver, and the resident clinical staff at GSH showed little engagement with the satellite clinic service. Over time, this attitude has shifted, and there has been much greater acceptance of the new BC clinic, with MPH staff taking pride in their clinic and ownership of HR requirements from within the hospital management structures.

Reduced follow-up visits and emphasis on new referrals

An evaluation of BC attendance statistics revealed that many low-risk women were brought for regular follow-up visits for benign disease or mammography for mastalgia. To address this, new protocols were developed to risk-stratify women and allocate resources more appropriately. A published, validated risk-evaluation calculator (IBIS-score)¹⁰ is used when special investigations are requested. In addition, patients returning for results of investigations are reviewed by surgical consultants in the BC who have at least six months' experience and who are able to evaluate confidently and discharge patients with benign disease.

As a result of these interventions, follow-up patient bookings decreased from 3 138 in 2015 to 2 419 in 2017, a 22% reduction. Total clinic numbers did not change (as shown in Figures 3 and 4) as there was a simultaneous increase in new patient numbers; however, this relative increase in new patient numbers was matched by an increase in the diagnosis of new breast cancers, validating the strategy to adjust the focus of the BC.

Figure 3 : Investigations and new cancer diagnoses at the GSH Breast Clinic, January - March 2019



Source: Annual GSH Breast Clinic Report, 2019.

Introduction of the breast telephone clinic

Despite attempts to run a same-day diagnostic service, patients with clinically benign disease often receive a later date for mammogram and ultrasound, and a follow-up clinic appointment for results. As most patients at a symptomatic BC have benign disease, these results are often normal or reassuring. Drawing on the experience of other health systems,^{11,12} a TC was established for selected patients to receive the results of their investigations.

Phoning patients with results or for appointments is usually fraught with problems. Clinicians may misplace folders or forget to call patients, and patient phone numbers are often captured incorrectly on the hospital record system. Also, many patients do not answer a random call from an unknown number or do not have access to their phones at the time they are called. To address these problems, the TC was established as a formally booked clinic on the hospital appointment system. A designated clerk was appointed by GSH to manage the TC by making all appointments and ensuring that a working phone number and correct contact details were available. The appointment is recorded on the standard hospital clinic card as a visual patient reminder and for workplaces with telephone restrictions. Two hospital telephones with direct outside lines were allocated to circumvent waiting for an outside line via the busy hospital exchange system.

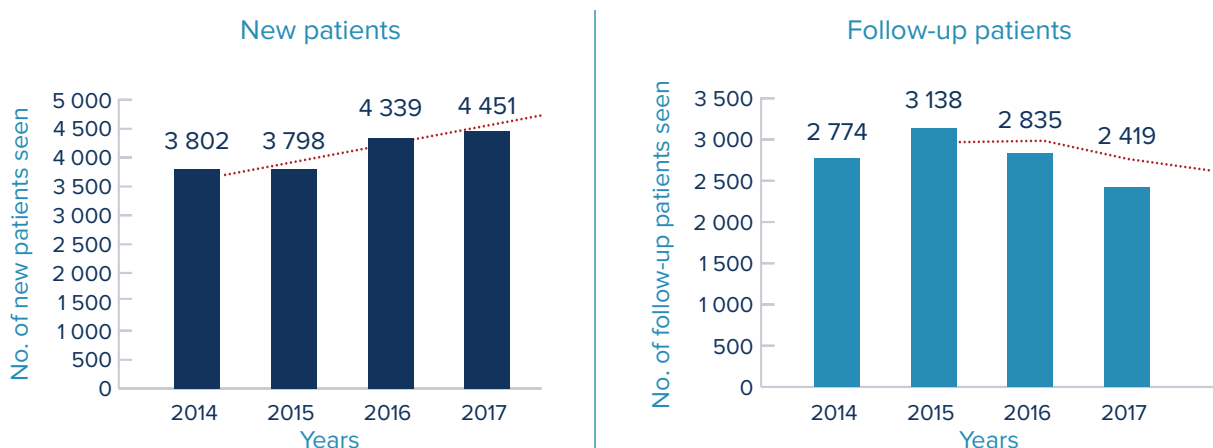
Only low-risk patients are selected for the TC as the aim is to convey anticipated benign or normal results. Clinical eligibility criteria for this category of patients is clearly documented and includes a normal clinical examination or clinically benign disease. Any patients undergoing a biopsy for suspected malignancy are excluded from the TC. The TC clerk collates folders and relevant reports for review

by a breast surgical consultant who makes an action plan to either discharge, follow up or recall patients. Surgical registrars are responsible for phoning patients at a set time and for recording each interaction in the patient's file.

The GSH TC was established in May 2018, with weekly bookings of 40 - 50 patients; with two registrars, the TC takes between 60 and 90 minutes to complete. A total of 1 857 patients have been booked into the TC since its establishment, and of these, 1 543 (83%) were contacted successfully. Patients not contactable on the first attempt are automatically booked into the next TC for a repeat call. If still not contactable, an SMS will be sent if the result is benign or normal. If follow up or further investigation is required, the breast nurse practitioner will be contacted. As a comparator, from September 2018 to March 2019, a total of 1 265 patients were booked for a physical BC clinic follow-up appointment. Of these, 309 (22.9%) did not attend.

However, aspects of this new system need to be improved. There is a high turnover of registrars through the BC and formal telephonic communication training has not been provided. In addition, not all GSH registrars are proficient in the three languages of the Western Cape: English, isiXhosa and Afrikaans. This raises the potential for miscommunication during a telephonic consultation. A quality-improvement study has not been done yet to evaluate how the TC is experienced by patients, and the accuracy of the information transmitted. This is necessary to assess whether the concept is safe and reproducible for other hospitals/clinical environments. In the longer term, phoning of patients could be shifted to trained nurse practitioners, a further motivation for training and recognition of this category of health workers.

Figure 4: Number of new and follow-up patients at the GSH Breast Clinic, 2014 - 2017



Source: Annual GSH Breast Clinic Report, 2019.

Breast radiology – partnerships and new ultrasound skills

Mammography and ultrasound are critical to both the diagnosis and exclusion of breast cancer. At GSH, the radiology department is under tremendous pressure to support not only the diagnostic breast service but also the follow-up mammogram investigations for breast cancer patients. With finite human and technical resources, a backlog in mammography and ultrasound became inevitable as patient numbers increased. In response to this, the BC team, with support from GSH management, entered into partnership with two non-profit health companies: PinkDrive and Project Flamingo.

PinkDrive mammography at GSH

PinkDrive is a health-sector NGO founded in 2009 to improve early detection of breast, cervical, prostate and testicular cancers. In 2011, mammogram waiting times at the GSH BC fluctuated between 16 and 24 weeks, depending on how busy the BC service was in the preceding months. PinkDrive was known in the province but was mainly engaged in providing mammograms to the public outside of a structured clinical service. The GSH clinical team engaged with PinkDrive to support the BC by providing mammograms on the hospital premises on clinic days. The number of mammograms done weekly has fluctuated over the years, but currently, PinkDrive provides approximately 100 mammogram bookings per month to support the GSH and MPH breast clinics. The total number of mammograms done in this partnership since 2011 is now 2 225, which by October 2018 brought the mammographic waiting time down to six weeks. Similar support for ultrasound at the hospital has been provided by PinkDrive since April 2019.

While this has been an extremely valuable partnership that has enabled timely diagnosis for hundreds of women, there are challenges to providing services through an NGO. Significant time and energy was spent setting up and maintaining the project. This included developing a memorandum of understanding to ensure that clinical records and mammographic images were integrated into the hospital system. Technical production of mammograms did not initially include a report on the findings. Thus, in the early years, these mammograms were reported on by GSH radiology staff who were already overburdened with their standard workload. Only in the latter years of the partnership was PinkDrive able to source funds to have mammogram reports done by contracted radiologists. This has been a great improvement but it has also introduced some complexities as the reporting is done off site and reports often take longer than in-house reports.

Although PinkDrive is in partnership with other public health facilities, it is unlikely that this model can be replicated throughout every breast service in the country, and an NGO-provided service will always be dependent on external

funding, making long-term sustainability a concern. In addition, provision of the mammogram machine does not necessarily include human resource capacity for reporting or for the ultrasounds that are often needed to complete the radiology report. Long-term solutions to the breast radiology crisis in the public sector must include capital investment in mammogram and ultrasound equipment as well as in human resources to perform and report on the investigations. If PinkDrive support should terminate for any reason, it will result in a major gap in our health service, which the public health system is unlikely to be able to fill.

Perhaps the most valuable contribution of PinkDrive has been to show that mobile breast imaging is a feasible option for taking breast diagnostic services to communities where they are most needed. If owned and serviced by the public health system, mobile diagnostic trucks could make breast diagnostic clinics a real possibility in district and secondary hospitals.

Surgeon-performed breast ultrasound enabled by Project Flamingo fundraising

Clinician-performed ultrasound is becoming an essential adjunct to clinical breast examination. Surgeons and breast clinicians trained in ultrasound are enabled to provide a more comprehensive evaluation, and in the case of young women, there can be potential same-day assessment and often discharge. While most breast biopsies in the GSH BC are done by palpation, a proportion are referred for ultrasound-guided biopsy in the radiology department. Because of the potential advantages to having an ultrasound in the BC, two clinicians in the BC team underwent breast ultrasound training. After that, the only barrier to implementing this service was lack of an ultrasound machine.

Project Flamingo was founded in 2010 to support public hospitals in providing holistic and timely breast cancer care. The Project has two key strategies: enabling extra cancer surgical lists and providing 'pamper packs' (packs of essential toiletries and donated cosmetics) to women with breast cancer. In 2017, through close collaboration with the surgical team at GSH, Project Flamingo launched a successful campaign to raise funds for an ultrasound machine for the BC. Approximately 20 clinician-performed ultrasounds are now done weekly, and since April 2017, 963 point-of-care ultrasounds and 149 ultrasound-guided biopsies have been performed. Radiology biopsy slots are now reserved for more challenging cases involving either impalpable breast lesions or micro-calcifications requiring stereotactic biopsies.

Point-of-care ultrasound required ultrasound training of the surgeons in the clinic. While performing these ultrasounds has improved same-day diagnosis for women and decreased the wait for ultrasound-guided biopsies, it has meant that the surgeon performing these ultrasounds has not been able to evaluate patients in the clinic. To utilise the human resources in the clinic more effectively, breast

nurses and medical officers should also be trained in breast ultrasound, particularly as point-of-care ultrasound is rapidly becoming an adjunct to the clinical examination.

Surgical services for breast cancer – the challenge of waiting times

Surgical operating lists are a scarce resource in most public health facilities. Groote Schuur only has capacity for four breast cancer operations per week, and fewer than this if breast reconstruction is undertaken. Over the last 15 years, the Breast Cancer MDT has increasingly referred patients to secondary hospitals for breast cancer surgery (after evaluation and treatment decision-making). Currently, 50% of all breast cancer surgery is booked at the three associated secondary hospitals, namely New Somerset Hospital, Mitchells Plain Hospital, and Victoria Hospital. However, capacity at the secondary hospitals to take on these operations is limited as breast-conserving surgery, breast reconstruction, and until recently, sentinel lymph node biopsy, cannot be performed outside the tertiary hospital.

Project Flamingo breast cancer lists

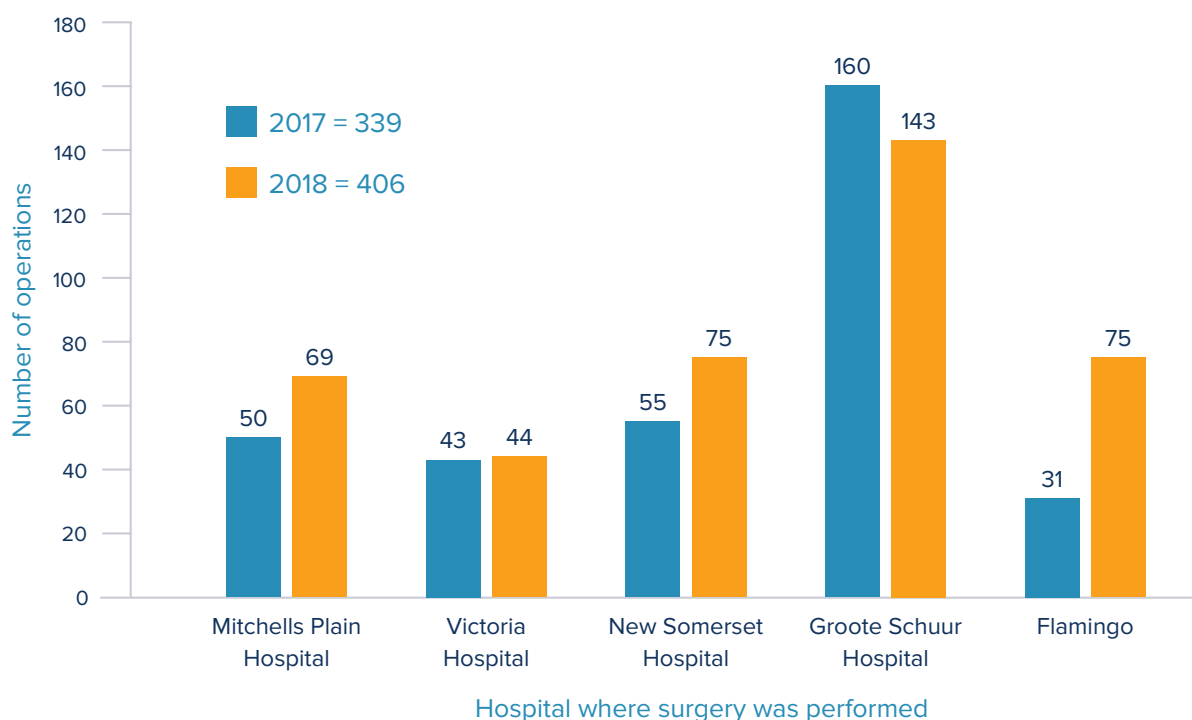
A summary of breast cancer surgeries performed at GSH and surrounding secondary hospitals is provided in Figure 5.

With the support of GSH management, the Breast Surgical Unit partnered with Project Flamingo to establish additional theatre lists. These were initially on public holidays or during hospital de-escalation periods in theatres not utilised on those days. For the first list in 2010, GSH provided the theatre space and consumables, Project Flamingo paid for a nursing theatre team for the day, and surgeons and anaesthetists volunteered their expertise and time. This model from the first list has been replicated, with minor modifications, over the last eight years.

When the Project Flamingo breast cancer lists were first initiated, the waiting time for surgery was 14 weeks. Currently a Project Flamingo list is performed on one Saturday of every month. In 2018, a total of 75 patients were operated on, and over the full period, 401 additional breast cancer surgeries have been done. This translates to approximately 100 additional full-day theatre lists. The current surgical waiting time is 10 weeks, still longer than the ideal time of 4 - 6 weeks, but without these lists the waits would now be 22 weeks, at which point the cancer in many women would be inoperable.

While the partnership with Project Flamingo has permitted us to improve our waiting times, arranging operating lists outside of the normal clinical work week has negative aspects. There is a significant additional administrative burden on clinical staff to bring patients in for these extra lists; nursing staff in the wards experience an additional load on what would normally be relatively quiet weekends or public holidays; and sourcing volunteer anaesthetists and

Figure 5 : Breast surgeries performed at GSH and secondary hospitals, 2017 - 2018



Source: Surgical Operative Database GSH.

surgeons requires constant attention. The clinical planning, risk and responsibility continue to lie with the surgeons and hospital staff. The partnership with Project Flamingo is valuable but it is potentially unsustainable as the work is primarily driven by volunteer surgeons and anaesthetists who already carry a heavy clinical workload.

Conclusions

This chapter has focused mainly on delays and resource constraints in the diagnosis and surgical care of breast cancer patients and the strategies that have been used to manage these in one particular service. It has not addressed the significant challenges faced in other aspects of treatment, such as chemotherapy and radiotherapy. These areas are also sites of ongoing work, including campaigning for better chemotherapeutic agents and decreasing radiotherapy waiting times through the appropriate use of hypofractionation schedules. Other innovative oncology strategies have been to revise staging investigation protocols to reduce unnecessary tests, and using the radiotherapy planning computed tomography (CT) scanner for breast cancer staging. A GSH Breast Cancer Working Group consisting of radiologists, pathologists, surgeons and oncologists has been established; this group meets regularly to discuss strategies to improve the systemic barriers to quality patient care at all levels of the system.

Improving efficiencies within the BC has prevented a collapse of the service under the increasing clinical load. Strategies such as ensuring standardised protocols for investigation and follow up and establishment of a satellite clinic have been necessary and timely interventions. Introduction of the TC has reduced multiple clinic visits for patients and allowed increased access to patients with new breast symptoms for evaluation. These strategies could potentially be implemented across a wide range of healthcare facilities. If properly implemented and quality assured, the TC in particular could impact positively on patient care in remote rural areas where transport and distance pose a barrier to follow-up but cellphone access is widespread.

Collaboration with various NPOs such as PinkDrive and Project Flamingo has assisted in supporting and maintaining the service in the face of a 5% annual increase in new cancers. These collaborations have also channelled some of the significant public and private resources raised for breast cancer directly into the public health system, with substantial benefits for patients most in need. The BC has also been fortunate in being actively supported by GSH leadership in the pursuit of these collaborations and in ensuring that appropriate oversight is maintained throughout.

While clinician-initiated strategies to cope with the burden of disease, and good-Samaritan efforts to support these strategies, should be applauded and supported, they should not replace a critical analysis of what is needed to deliver equitable and quality care throughout South Africa. The specific partnerships and relationships the BC has built in this one hospital may not be available to clinical services in rural communities or provinces with poor health system infrastructure. It should also be noted that despite these numerous efforts and collaborations, the GSH BC is still not delivering breast cancer care within the quality parameters set out both internationally and nationally.

The strategy of forming partnerships and the improved efficiencies described here can only hold the service for a limited time. Globally, cancer incidence continues to rise,¹³ and cancer in the developing world is set to become the next major health crisis. Whereas in prior decades breast cancer was considered primarily a problem in affluent countries, in 2012 the majority of new breast cancer cases (53%) were among women in low- and middle-income countries.¹³ South Africa is therefore set for a significant increase in cancer burden, for which we need to plan, as these patients will flow into breast cancer care systems such as the one at GSH that are already stretched beyond capacity.

Recommendations

In his inaugural State of the Nation Address on 16 February 2018, President Cyril Ramaphosa recognised the importance of the growing cancer epidemic and announced the initiation of strategies such as the National Cancer Campaign to address this. Importantly, the National Department of Health has recently completed the Clinical Guidelines for Breast Cancer Control and Management.¹⁴ Clinicians need to engage actively with provincial and national Departments of Health to ensure that these excellent policies take concrete and practical form.

More specifically, at the diagnostic level, symptomatic, one-stop BCs should be established at all district and secondary hospitals to ensure that women with breast symptoms can be seen within the two-week timeframe suggested by the new South African breast cancer guidelines.¹⁴ For treatment after diagnosis, a breast cancer care plan is needed that is not hospital or specialty based. A seamless flow is needed between district diagnostic services, regional surgical services, and tertiary oncology and multidisciplinary team services. This means approaching funding and resourcing of breast cancer care outside of the traditional silos of hospital and department funding to global costing based on the full pathway from diagnosis to palliative care. Critical to this co-ordination of care between the district/secondary diagnostic centres and tertiary hospital MDTs is the Breast Nurse Practitioner, whose training and employment is promoted by the new national breast cancer guidelines.¹⁴

Breast cancer care in South Africa receives significant support from the NGO sector and the broader public. These projects and fundraising initiatives have the potential to support the essential work of the public health system but need to be channelled into meaningful and sustainable partnerships. The NGO partnerships at GSH have undoubtedly had a meaningful impact on improving quality healthcare access. The next step is to integrate these resources systematically into our national health system to ensure equity and sustainability.

Hopefully the momentum created by the national focus on cancer will stimulate a vital collaboration between community organisations, primary, secondary and tertiary hospital leadership, the NGO sector, breast cancer survivor organisations and role players in provincial and national Departments of Health to ensure that breast cancer care is planned, coordinated, and appropriately resourced.

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Developing quality standards for hypertensive disorders in pregnancy at primary care level in South Africa

Authors

Renay Weiner^{i,ii}
Lawrence Chaukeⁱⁱⁱ
Agnes Erzseⁱⁱ
Coceka Mnyaniⁱⁱⁱ
Maryke Wilkinsonⁱⁱ
Makgobane Ramogale-Zungu^{iv}
Sikhonjiwe Masilela^v
Karen Hofmanⁱⁱ

Development of Quality Standards may enhance the implementation of clinical practice guidelines in South Africa, which should result in high-quality, evidence-based, and cost-effective care in the country.

South Africa is committed to reducing its maternal mortality ratio to below 70 per 100 000 live births by 2030 (from 138 per 100 000 live births in 2015). The National Department of Health developed maternity care guidelines for primary care and district hospitals in 2016, but implementation needs to be reviewed and improved.

Quality Standards (QS) are an innovative implementation tool that can bridge the gap between clinical guideline development and successful implementation thereof. QS are evidence-based, clinical statements designed to maximise impact on clinical outcomes in areas of poor or highly variable clinical practice. The National Institute for Health and Care Excellence in London has been developing QS since 2010 for use in England's National Health Service, as well as assisting countries like Vietnam and India to develop and implement QS.

This review documents the recent development of South Africa's maternal QS for hypertensive disorders in pregnancy at primary care level. These QS were developed

to contribute to the Gauteng province goal of reducing hypertensive disorders in pregnancy by 20% by 2020. A multi-disciplinary working group was established that reviewed recommendations derived from the national clinical practice guideline for maternity care and other local and international evidence, and seven quality statements were developed by October 2018. These QS have been aligned with existing initiatives to address hypertension-related morbidity and mortality.

Development of QS may enhance the implementation of clinical practice guidelines in South Africa, which should result in high-quality, evidence-based, and cost-effective care in the country. Evidence of successful implementation in other low- and middle-income settings suggests that QS complement and strengthen existing health-system-wide quality-improvement initiatives, which are essential for South African National Health Insurance to succeed. For QS to guide quality improvement efforts effectively in South Africa, they must be pilot tested, evaluated, maintained and implemented in different healthcare settings.

i Research and Training for Health and Development
ii South African Medical Research Council Centre for Health Economics and Decision Science Research Unit, PRICELESS, University of the Witwatersrand School of Public Health, Johannesburg
iii Department of Obstetrics and Gynaecology, University of the Witwatersrand, Johannesburg
iv Edenvale Hospital, Gauteng Department of Health
v Maternal, Child, Neonatal and Nutrition Directorate, Gauteng Department of Health

Introduction

South Africa has high levels of maternal mortality. From 2003, more than 1 100 mothers have died annually from complications during childbirth.¹ This figure represents more maternal deaths per live births than in 1998.² While South Africa's national spending on health ranks high among emerging economies, maternal health outcomes are lagging,³ as shown in Figure 1.

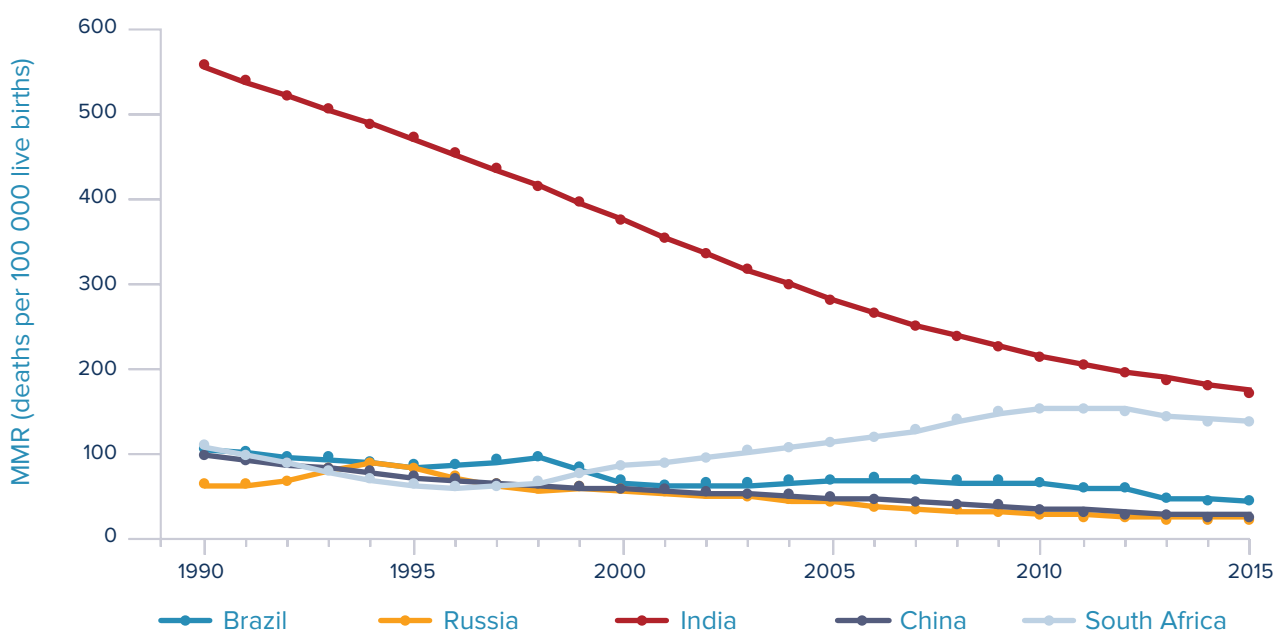
South Africa is committed to achieving Sustainable Development Goal (SDG) target 3.1 by reducing the maternal mortality ratio from 138 per 100 000 live births in 2015 to below 70 deaths per 100 000 live births by 2030.⁵ While the number of maternal deaths related to HIV and obstetric haemorrhage decreased from 2011 to 2016, deaths due to hypertensive disorders of pregnancy increased by 14% over this time period.¹ Hypertensive disorders were the main underlying direct cause of maternal deaths (n=661) in South Africa between 2014 and 2016, accounting for up to one-third of the direct causes of deaths (Table 1). Between 2014 and 2016, Gauteng province (GP) had the highest number of maternal deaths (n=792) in the country, in part due to the large number of births taking place in the province and in part due to having the highest number of deaths due to hypertensive disorder in pregnancy (n=116).¹ Table 1 shows the distribution of causes of maternal deaths in South Africa from 2014 to 2016.

While achieving desired clinical outcomes in hypertensive disorders in pregnancy requires experienced and skilled

staff able to make appropriate clinical decisions, this needs to be complemented by a strong health system where facilities are appropriately equipped and stocked, and referral and transport systems are highly functional. A key finding of the Saving Mothers Report 2014 - 2016 was that referral problems, including inter-facility transport issues, were a major contributor to maternal deaths. In the case of hypertension-related maternal deaths in pregnancy, transport problems were identified as an avoidable factor in 18.5% of deaths, and at community-health-centre level, delays in referring patients accounted for 19.4% of deaths.¹ Lack of skilled personnel to screen and manage hypertension in pregnancy is a persistent concern; 30.7% of avoidable factors for hypertension-related maternal deaths are due to a lack of appropriately trained doctors or nurses.¹ Poor initial assessment, problems with recognition/diagnosis, referral delays and sub-standard management have been found to be important avoidable factors for deaths at community-health-centre level.¹

Identifying and managing hypertensive disorders and complications thereof in pregnancy constitutes one of the top 10 priority targets for improving maternal, neonatal and child health.⁶ Moreover, the Minister of Health has called for renewed focus on patient safety and implementation of the National Core Standards⁷ to help address the explosion in medical malpractice litigation.⁸ The National Department of Health (NDoH) developed and distributed comprehensive Clinical Practice Guidelines (CPGs) for maternity care in primary care settings and district hospitals.⁹ Despite clear commitment to quality health care, implementation of policies and guidelines has not been optimal: initiatives

Figure 1: Maternal mortality ratios in BRICS countries, 1990 - 2015



Source: World Bank, 2017.⁴
BRICS = Brazil, Russia, India, China, South Africa.

have been fragmented and uncoordinated; there has been insufficient focus on quality improvement through implementing evidence-based care; and there has been insufficient training of relevant healthcare personnel in quality improvement.¹⁰

In response to this situation, a partnership was formed between the Gauteng Department of Health (GDoH), the University of the Witwatersrand Obstetrics and Gynaecology Department, and the South African Medical Research Council (SAMRC)/Wits Centre for Health Economics and Decision Science (PRICELESS SA), and maternal Quality Standards (QS) were developed for the management of hypertensive disorders in pregnancy at primary care level in GP.

This chapter describes the process of developing these QS for maternal health in GP, outlines lessons learnt, and provides recommendations. In particular, the chapter addresses the following questions: what are QS; how are they used; how are QS different from clinical guidelines; what are the necessary steps in the process of QS development; and what is needed going forward?

Quality standards and their application

QS are concise sets of evidence-informed statements that describe optimal clinical care, and that can be used in combination with the associated quality measures to stimulate and evaluate clinical quality improvement over time in a particular area of care.¹¹

QS are practical, clear and measurable, and focus on areas where sub-optimal care and variation in clinical practice are common. A guiding principle of QS is that they are based on evidence-informed clinical recommendations; as such, high-quality clinical practice guidelines (developed through a systematic review of the best available evidence) are good evidence sources for QS development. QS are not clinical guidelines in themselves, but instead prioritise and focus on a carefully selected set of clinical recommendations that will have the highest potential impact on outcomes if implemented. Therefore, QS can bridge the gap between clinical guidelines and their successful implementation.

QS can be used by different audiences and enable:

- Patients and carers to gain information on the quality of care they can expect;
- Health professionals to provide evidence-informed clinical care that can be audited and drive continuous quality improvement;
- Facility and district managers to track the availability of drugs and equipment, as well as training requirements;
- Service providers to examine the performance of their organisation and drive quality improvement;
- Policy makers and health service managers to ensure that high-quality care is commissioned, and help them to budget and plan accordingly; and
- Medico-legal processes to refer to documented standards of care for a particular setting when sub-standard care leads to litigation.

Quality standards have been used successfully in the National Health Service (NHS) in England and Wales since 2010, applied in more than 90 therapeutic areas and care pathways.¹² This work occurs within the context of a public body, the National Institute for Health and Care Excellence

Table 1: Number of maternal deaths per direct underlying cause per year in South Africa, 2014 - 2016

Underlying cause	2014	2015	2016
Direct	689	702	648
Hypertensive disorders	221	222	218
Obstetric haemorrhage	226	217	181
Ectopic pregnancy	23	36	36
Miscarriage	48	61	56
Pregnancy-related sepsis	65	65	71
Anaesthetic complications	34	28	25
Embolism	38	37	36
Acute collapse	26	31	20
Miscellaneous	8	5	5

Source: NDoH, 2018.¹

(NICE), which also sets priorities and looks at the impact of these interventions through a lens that includes economic evaluation. A small number of QS have also been initiated and adapted successfully in resource-constrained settings, where conditions are similar to those in South Africa. In India, the State Government of Kerala (with technical assistance from NICE International) developed and implemented QS for postpartum haemorrhage.¹³ The initial successes led to the expansion of QS to other areas of care, notably to improve detection and management of hypertension in pregnancy.¹⁴ A recent evaluation of the QS programme in Kerala found that hospitals participating in the intervention saw improvements in several preventive care measures.¹⁵ A similar process supported the development and implementation of diabetic foot QS within primary care in Mumbai,¹⁶ and the Ministry of Health in Vietnam developed a QS for hospital management of acute stroke.¹⁷

In South Africa, different strategies have been developed across primary health care (PHC) and hospital settings to improve quality of care for mothers. These initiatives include organisation-wide quality-improvement programmes such as the National Core Standards for Health Establishments in South Africa issued by the Office of Health Standards Compliance (OHSC),⁷ and programme- or service-specific quality improvements like the Basic Antenatal Care (BANC)¹⁸ and the Adult Primary Care (APC) by the NDoH, which is the new name for the Primary Care 101 initiative developed by the Knowledge Translation Unit at the University of Cape Town Lung Institute.¹⁹ Similar to existing quality-improvement initiatives, QS are evidence-based, developed through a consultative process, and designed to be locally relevant. QS add additional value by focusing on specific areas of clinical care that have been shown to drive morbidity and/or mortality, and they include implementation steps that strengthen clinical care and health services. Measures should be put in place to track quality-improvement for each quality statement, and to estimate the costs and savings of implementing the changes.

Developing quality standards in South Africa

Initial discussions on applying QS to the South African context started in 2016 when PRICELESS SA convened a workshop with key stakeholders, including the national and provincial Departments of Health, District Clinical Specialist Teams (DCSTs),^a NICE International, and the Kerala Federation of Obstetrics and Gynaecology. The workshop, 'Maternal Care Quality Standards in the South African Context', was designed to review existing guidelines and quality-improvement initiatives in maternal care, to learn about the experience of adapting NICE QS to developing country settings, and to explore the applicability of the QS approach to the South African context. What followed was the proposal of a five-step QS development framework by

PRICELESS SA for developing QS in South Africa (available on the PRICELESS SA website).²⁰

At the outset of the project, a multi-disciplinary working group was set up to develop QS for hypertensive disorders in pregnancy for Gauteng province. The working group included a chairperson and obstetricians, public health specialists, nurses, health service managers, provincial representatives, Gauteng representative of the National Committee on Confidential Enquiries into Maternal Deaths, PRICELESS SA, and a representative from the International Decision Support Initiative (iDSI) (a global network working to achieve universal health coverage and SDG3).

Developing the QS involved several stages. The first step was defining the scope and determining the clinical focus area of the QS. The priority area for the project was identified as hypertensive disorders in pregnancy at primary care level. A selection of simple and implementable quality statements were drafted for hypertensive disorders in pregnancy at primary care level, based on the recommendations in the Guidelines for Maternity Care: A Manual for Clinics, Community Health Centres and District Hospitals⁹ and a review of the published literature on hypertension in pregnancy, including the International Society for the Study of Hypertension in Pregnancy Guidelines.²¹ Through close collaboration and multiple inputs from the working group and DCSTs from all five districts in GP, the quality statements were developed further to include measurable performance indicators, following the NICE QS format.¹¹ The DCSTs were identified as being central given their role in providing supportive supervision and clinical governance, ensuring quality of clinical services, supporting health systems and logistics, and their role in teaching and research activities. The DCSTs include a specific focus on maternal and child health.²²

The draft QS for screening and management of hypertension in pregnancy at primary care level: clinics and community health centres (see Table 2) is a set of seven statements that the working group prioritised to drive quality improvement in the management of hypertension in pregnancy at primary care level in GP. QS 1 - 4 aim to strengthen detection and timely management by clinical staff, while QS 5 - 7 focus on health system support of desired clinical outcomes, spanning the care continuum from community to primary care clinics/health centres to hospital levels for severe cases.

In addition to the seven quality statements, the full QS includes the following information:

- Definitions of key terms;
- Quality measures (structural/infrastructure, process and outcome measures);
- Implications for midwives and professional nurses, health facility managers, provincial department, patients and the public;
- Data sources; and
- Relevant guidelines and audit tools.

a The DCST includes medical and nursing specialists from Obstetrics and Gynaecology, Paediatrics, Family Medicine/PHC and an Anaesthetist.

Lessons learnt

Active guidance of working group members, including the Gauteng Department of Health's Quality Assurance Unit, was key in developing the QS and in aligning the QS with existing initiatives addressing hypertension-related morbidity and mortality in South Africa. Further presentation and feedback from the National Maternal Neonatal Child Health Women and Nutrition Think Tank has formed an important part of the process.

Local context

An important lesson learnt in the development process is that while QS principles are relevant to health systems globally, there is no one-size-fits-all approach.¹³ While scientific evidence and guidelines are frequently provided

Table 2: Summary of quality standards and statements for Gauteng, 2018

Quality standard	Quality statement
Screening for hypertension in pregnancy at primary care level (clinics /community health centres (CHCs))	In the case of all pregnant women, blood pressure is taken, recorded, and abnormalities reported, and urine is tested for protein (using reagent strips/dipstick) at the first antenatal visit and every subsequent antenatal visit.
Management of hypertension in pregnancy at primary care level	Any pregnant woman who has a diastolic blood pressure (DBP) ≥ 90 mmHg or a systolic blood pressure (SBP) ≥ 140 mmHg four hours apart at first or subsequent antenatal visits with or without proteinuria is referred to a district or regional hospital. Any pregnant woman who has a progressively increasing blood pressure, even if below 140/90 mmHg, is referred to a district or regional hospital. ^a
Management of severe hypertension at primary care level before 20 weeks of gestation	Any pregnant woman <20 weeks who has a DBP ≥ 110 mmHg and/or a SBP ≥ 160 mmHg at first or subsequent antenatal visits with or without proteinuria receives Adalat (nifedipine) 10 mg immediately and Aldomet (methyldopa) 1 g stat and is referred to a regional or tertiary hospital on the same day.
Management of severe hypertension at primary care level after 20 weeks of pregnancy	Any pregnant woman who is at gestational age 20 weeks or more and who has a DBP ≥ 110 mmHg and/or a SBP ≥ 160 mmHg at first or subsequent antenatal visits with or without proteinuria receives Adalat 10 mg immediately, Aldomet 1 g stat, a loading/initial dose of magnesium sulphate immediately (4 g in 200 ml saline to run over 20 minutes), 10 g by intramuscular injection (5 g in each buttock), and is referred to a regional or tertiary hospital as an emergency.
Ensuring availability of appropriate equipment for the diagnosis of hypertension in pregnancy at clinics and CHCs	Adequate numbers of working BP machines available, i.e. one per consultation room, with the correct cuff sizes, and calibrated regularly as per manufacturer requirements.
Effective referral processes for hypertension in pregnancy at primary care level	An effective referral is achieved in all cases of hypertension (SBP <160 mmHg and/or DBP <110 mmHg) through a standard referral letter, clear patient information and a receiving facility. The patient is able to travel to the hospital independently on the same day. Facility contacts patient through community health worker to check if she has gone to the referred facility. ²
Effective referral processes for severe hypertension in pregnancy at primary care level	An effective referral is achieved in all cases of severe hypertension through direct telephonic contact with the obstetric doctor on call, transport in an obstetric ambulance with a response time of 15 minutes, and direct admission to the maternity section of the hospital.

^a These are Gauteng-specific quality standards and statements in response to local experience.

at global level by organisations such as the World Health Organization, decisions must be made locally and with consideration given to the relevance of source guidelines (e.g. cost-effectiveness), and contextualisation. Given that QS are highly context-specific, provinces, and possibly districts, may have specific requirements and procedures and therefore may need to adjust the QS-development process to fit their local setting. Practically, QS will need to be adapted to local conditions such as the available skills at facility and district levels, e.g. the number and distribution of advanced midwives, which will likely vary across districts, as well as the training and referral processes in place. Increasingly, the practice of referral to the next level of expertise is being adopted, which takes account of this variation. Catchment areas and/or districts need to identify where the next level of expertise is after the PHC clinic or CHC. Given that DCSTs are engaged in several primary care level trainings, piloting of the QS will also need to explore how best to synergise and if possible integrate QS training so that existing efforts are strengthened. Despite local variation, it is anticipated that the QS development process described in this chapter will be useful in providing health professionals with a starting point from which they can initiate the development/adaptation of their own QS to drive quality improvements locally.

Process of quality standard development

The development process can take up to six months and it builds heavily on CPGs. Imperative to the process is the engagement of all key role-players such as government entities, regulatory bodies, clinicians and the public health sector. Continuous stakeholder involvement through regular meetings and follow-up consultations throughout the QS development process will ensure commitment and buy-in at appropriate levels. To this end, a lead organisation is needed, with administrative, co-ordination and documentation capacity. This role was fulfilled by PRICELESS SA.

Identifying the focus area

Prior to developing QS, it is important that stakeholders/QS working groups consider:

- What are the local priorities for improvement?
- Which QS will have the most impact in the local context?
- How can local health system structures, processes and resources drive implementation of QS?²³

Continuity

The enthusiasm and time invested in QS development need to be matched by investment in testing the implementation at identified sites. Due to lack of funding, implementation and testing have been challenging. Future efforts to develop QS need to ensure that there is continuity from development to pilot testing of implementation, and related evaluation.

Conclusions

As South Africa moves towards Universal Health Coverage through the implementation of National Health Insurance, ensuring access to good-quality health care is essential. In light of resource constraints, policymakers have to consider how available resources can be used to achieve good-quality care.²⁴ Strengthened implementation of existing national CPGs would lead to greater progress in reaching national and international health targets; however, the cost of such improvements is currently unknown. It is imperative to understand the costs of quality improvement through conducting economic evaluations of the proposed interventions. Evidence from Niger showed improved health and reduced healthcare resources when a quality-improvement initiative was conducted in childbirth facilities. Improved quality led to reduced delivery cost by an average of 20%, from \$35 to \$28.²⁵ Importantly, systematic economic assessment of the costs and effects of quality-improvement interventions is essential for prioritising decision making and could be embedded in a more systematic mechanism ideally driven by a priority-setting entity. Such an institution could provide technical and consultative support in economic evaluation of interventions and lead to transparent and evidence-based health spending.²⁶ In South Africa, options for locating such an entity within an existing structure such as the OHSC, or creating a new institution, need to be carefully appraised.

Adapting the NICE Quality Standard framework or a similar tool to the South African context should be tested to encourage implementation of high-quality, evidence-based, and cost-effective care. For the first time in South Africa, the GP maternal quality standards initiative has demonstrated that QS can be developed relatively quickly through a stakeholder engagement process. This allows healthcare providers to initiate appropriate quality-improvement initiatives based on accessible and reliable indicators of quality.

Recommendations

Since work to date has not examined processes of implementation or the impact of QS in practice, an evaluative study is recommended to explore the effectiveness of QS in improving the quality of maternal health care. To this end, a pilot study within one district of Gauteng is recommended as the next step.

From the NICE experience, successful implementation of QS requires a combination of driving forces, as shown in Figure 2.

These principles will apply similarly to pilot testing of the QS, and specific elements are recommended below:

Partnerships and political support

One of the most important success factors in QS implementation is involvement and commitment from all relevant stakeholder groups (e.g. provincial and district programme managers, midwives, clinicians, training institutions and research groups) from the start of the QS development process. Continuous engagement will allow for sustained political will and commitment to using QS to drive quality improvement and ensure that frontline staff are supported and that the required activities/changes are funded adequately.

Baseline data

A survey of baseline activities and infrastructure within the facilities of the identified pilot site will be important to document in advance of implementation. This will add additional focus to aspects requiring quality improvement. In the context of these QS, baseline data will include:

- BP machines with pregnancy cuffs and service records;
- Reagent strips;
- Drug availability;
- Written referral processes;
- Emergency transport;
- Trainings currently underway;
- Role and training of community health workers; and
- Quality measures and data sources for quality statements.

The QS include proposed quality measures for infrastructure, processes and outcomes. Prior to training in

QS, routine data need to be identified that can be used to generate the quality measures. Where data are lacking in current systems, adaptations to data collection will need to be explored. As far as possible, quality measures need to be tracked using existing information systems.

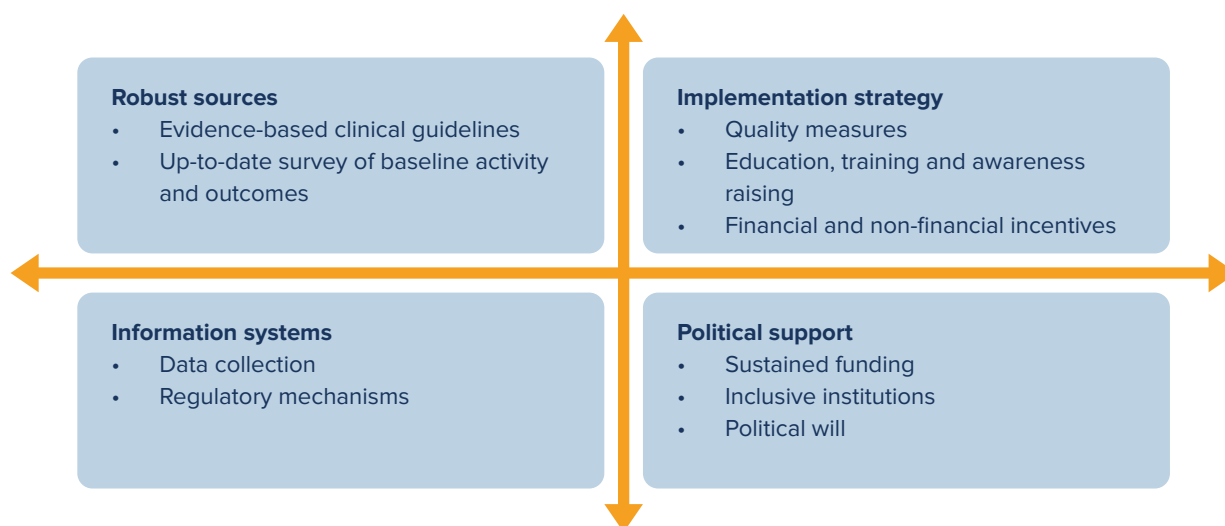
Training

The DCSTs have been identified as vital partners that can drive implementation of maternal health QS. Several initiatives are underway in all GP districts, but challenges remain, including ongoing gaps in staff knowledge and skills in identifying and managing hypertension in pregnancy at PHC level, and challenges with adherence to existing protocols.^b QS training needs to harmonise, align and strengthen existing quality of care training underway at PHC level, and provision should be made to train community health workers in ward-based outreach teams to QS 6 and 7 level (Table 2).

Documentation

In order to determine the applicability and acceptability of maternal QS in South Africa, specific attention must be paid to the appropriateness and effectiveness of implementation through the DCSTs. The pilot needs to test the value of the quality statements and related measures at primary care level, as well as provide data on factors that enable or hinder implementation, the processes of implementation, and an early indication of the impact of maternal health QS in shifting maternal outcomes. Evaluation will also allow identification and tackling of additional issues previously not recognised and inform up-scaling of the approach.

Figure 2: Driving forces in quality standard implementation



Source: Cluzeau, 2016.²³

^b DCST consultation meeting, PRICELESS, 15 October 2018 attended by Gauteng Department of Health and representatives from all five districts in the province.

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Understanding barriers to HIV testing and treatment:

a study of young men and healthcare providers in KwaZulu-Natal and Mpumalanga

Authors

James Bellⁱ
Sunny Sharmaⁱ
Shawn Maloneⁱⁱ
Melissa Levyⁱ
Jemma Reastⁱ
Kristen Littleⁱⁱ
Nina Hasenⁱⁱ

Several personal, cultural and social issues inhibit men's HIV testing and treatment-seeking. Healthcare providers also face many difficulties in providing these services to men.

In South Africa, men experience worse HIV-related outcomes than women. It is estimated that seventy-eight per cent of men living with HIV know that they are HIV-positive, versus 89% of women. Sixty-seven per cent of men who have been confirmed as HIV-positive are on treatment, compared with 72% of women. Research is needed to understand the dynamics of this disparity and to design interventions to close the gap.

This qualitative study aimed to describe both men's experience accessing HIV services and the experience of healthcare providers delivering such services in order to understand why men at risk often do not test for HIV or initiate treatment after testing positive. Fifty-eight black South African men were interviewed: the respondents were from KwaZulu-Natal and Mpumalanga, aged 25 - 34 years, sexually active, and had not undergone voluntary medical male circumcision. Sixty-four healthcare providers working in public or non-governmental organisation clinics in the same provinces were also interviewed; each interviewer had at least five years' experience testing and treating men. The interviews were analysed thematically.

Many men live in an environment of uncertainty and perceive testing and treatment as burdensome. While social norms prime them to appear indifferent, many are afraid. They believe that a positive diagnosis will bring loss of status and relationships, so many prefer not to test, or they delay treatment. This is compounded by traumatic childhood memories of the early days of the AIDS epidemic.

At clinics, some men perceive care to be judgemental, which discourages them from testing. Providers express frustration with men's apparent apathy, although this is often a misreading of men's fear. Health worker frustration is compounded by the challenges of the healthcare system, including pressure to reach ambitious targets and to comply with administrative requirements.

Although the study was geographically limited and the sample was not designed to be representative, the results suggest that current approaches may be inadvertently driving men away from services. Clinic reorganisation, provider training, and greater understanding of the needs of men and healthcare providers may increase men's uptake of HIV services.

i Ipsos Healthcare

ii Population Services International

Introduction

In South Africa, men experience worse HIV-related outcomes than women. It is estimated that 78% of HIV-positive men know that they are living with HIV, versus 89% of women. Sixty-seven per cent of HIV-positive men who have been diagnosed are on treatment, compared with 72% of women.¹

In 2001, prior to the widespread availability of antiretroviral therapy (ART), the adult HIV prevalence rate was over 25% in several South African provinces.² Today, South Africa has the largest HIV treatment programme in the world, providing treatment for 4.4 million people living with HIV (PLHIV).³

While the scale-up of HIV testing and treatment represents progress, the data also show that more needs to be done if South Africa is to achieve the UNAIDS 90-90-90 goals for epidemic control, namely 90% of people living with HIV know their status; 90% of those who know their status are on treatment; and 90% of those on treatment are virally suppressed.³ Recent estimates show that HIV incidence rates may be starting to rise again,⁴ and emerging research has increased understanding of the sexual networks driving transmission.⁵

A large body of literature describes vulnerability to HIV acquisition among adolescent girls and young women.⁵⁻⁸ Comparatively less is known about men, even though men are less likely to test for HIV, less likely to initiate treatment if positive, and less likely to adhere to treatment once started, all of which results in significantly lower rates of viral suppression.¹ Gender disparities are reflected in mortality data: women are 27% less likely to die from HIV than men, and more than half of all male HIV-related deaths occur in men who have never sought HIV and AIDS care.⁹

The literature shows that men's vulnerability to HIV can be partially attributed to masculine gender norms. An extensive body of work reveals the role of masculine constructs in fuelling HIV acquisition, e.g. the value placed on strength, self-sufficiency and overt expression of sexuality.¹⁰⁻¹² Myths of male invulnerability and shame in seeking help,^{10,13} pervasiveness of excessive alcohol consumption;¹⁴ social marginalisation of certain groups of men, which along with unemployment, "creates a nexus of trauma, poverty, and depression";¹⁵ anticipated stigma;¹⁶ and exclusionary language and policies in health clinics¹⁷ act together to inhibit men's HIV testing and care-seeking. This is especially problematic for black men in South Africa, who experience higher HIV prevalence than other racial groups.¹ This has been attributed to differences in sexual behaviour,¹⁸ but should also be considered in the context of socio-political factors including colonialism, apartheid and forced migration, which have facilitated the spread of HIV among this group.^{19,20}

While previous research has explored men's barriers to HIV testing and treatment initiation in South Africa, current service-delivery models are still not reaching enough men to achieve epidemic control. There is also poor understanding of the difficulties that healthcare providers (HCPs) face in providing HIV services to men. This study aimed to map men's routes to HIV testing and treatment in selected sites in KwaZulu-Natal (KZN) and Mpumalanga (MP) provinces. Psychological and practical facets of the journey were included in order to understand men's engagement with the healthcare system and to develop recommendations on how to increase service uptake. The study also aimed to understand the attitudes and behaviours of HCPs regarding HIV testing and treatment, and to develop recommendations on how to improve provider effectiveness in reaching men.

Methodology

Study sites

KwaZulu-Natal and Mpumalanga were selected because of their high HIV prevalence rates compared with other provinces.¹ Eight sites across the two provinces were selected non-randomly, following consultation with local district governments about the areas of highest HIV burden and greatest need for improved interventions. The samples of men and providers were split proportionally according to population size across urban and rural areas.

Men were eligible to participate if they were between 25 and 34 years old, black, and sexually active. Men who had been voluntarily circumcised in a medical facility as adults were excluded, as they were considered to have already demonstrated a relatively high level of engagement with the healthcare system and they were also biologically at lower risk of HIV acquisition. The sample comprised men from different stages of the HIV testing and treatment continuum, including HIV-positive men on ART, HIV-positive men not on ART, HIV-negative men, and men who did not know their status.

Providers were eligible for the study if they had at least five years' experience testing or treating clients for HIV, or if they were responsible for linking clients to care. It was necessary for them to have experience working with men similar to the participants in the study target group. Providers were eligible if they worked in a government or non-governmental organisation (NGO) clinic, hospital, or community setting. Private providers were not eligible for participation.

Recruitment and interview process

Specialist recruiters used a screening questionnaire to select respondents. Respondents living with HIV and who were known to health services were recruited through registered South African HCPs. Informed consent was obtained from all respondents and an incentive was

provided (R160/\$11 for men and R185/\$13 for HCPs). The research was approved by the Population Services International Research Ethics Board in the USA, and the Foundation for Professional Development Review Board in South Africa. Approval was granted from all districts and provinces where the research took place.

In June and July 2018, 58 men were recruited to the study, 38 (66%) from KZN and 20 (34%) from MP. Fifty-two per cent were from urban areas, and 48% from rural sites. Fifty-two per cent of participants were 25 - 29 years old, and 48% were 30 - 34 years old (Table 1). A total of 64 HCPs were recruited, 43 (67%) from KZN and 21 (33%) from MP. The

sample was evenly split between facility- and community-based providers (Table 1).

Respondents completed a two-hour in-depth interview administered by trained male data collectors using a semi-structured discussion guide. The guide was developed based on a literature review and insights from formative ethnographic research. Interviews were conducted in the language of the participant's choosing by a moderator fluent in that language. The interviews were recorded, transcribed, translated into English, and analysed thematically by a team of researchers. Themes were developed inductively from the data and refined iteratively through group discussions.

Table 1: Sample of men and healthcare providers in HIV services, KwaZulu-Natal and Mpumalanga, 2018

Men							
Province	District	Subdistrict	Urban	Rural	Community-based	Clinic-based	Total
KwaZulu-Natal	eThekweni	Inanda C and Newtown A (these are both in Inanda)	11	0	5	6	11
	Ugu	uMuziwabantu	0	8	4	4	8
	Zululand	Ulundi	0	9	5	4	9
	Umgungundlovu	uMsunduzi	10	0	5	5	10
Province total			21	17	19	19	38
Mpumalanga	Ehlanzeni	Mbombela	9	0	5	4	9
	Gert Sibande	Lekwa	0	6	3	3	6
	Nkangala	Empumelelweni	0	5	3	2	5
Province total			9	11	11	9	20
Grand Total			30	28	30	28	58

Healthcare Workers							
Province	District	Subdistrict	Urban	Rural	Community-based	Clinic-based	Total
KwaZulu-Natal	eThekweni	Inanda C or Newtown A (these are both in Inanda)	13	0	6	7	13
	Ugu	uMuziwabantu	0	10	5	5	10
	Zululand	Ulundi	0	10	5	5	10
	Umgungundlovu	uMsunduzi	10	0	5	5	10
Province total			23	20	21	22	43
Mpumalanga	Ehlanzeni	Mbombela	7	0	3	4	7
	Gert Sibande	Lekwa	0	7	4	3	7
	Nkangala	Empumelelweni	0	7	4	3	7
Province total			7	14	11	10	21
Grand Total			30	34	32	32	64

Key findings

Thematic analysis identified barriers to men accessing health services for HIV testing and treatment. Unless otherwise specified, the terms ‘men’ and ‘HCPs’, will be used throughout to refer to respondents who fit the sample criteria in the geographical area of interest. The findings should be interpreted in the context of the qualitative sample sizes and limited geographical scope of the research, and caution should be taken in generalising beyond the groups sampled or to other areas of South Africa.

HIV trauma

The analysis revealed significant personal and social trauma associated with HIV. Many of the men first experienced HIV in the pre-ART era, which created lifelong traumatic associations that continue to condition their current behaviours. Loss of parents and other family members to AIDS was widespread among the sample, and this trauma was compounded by a culture of shame and silence in which AIDS deaths were rarely spoken about openly.

For many of the men, early experiences of HIV education also inculcated strong negative associations. Early educational methods were often designed to instill fear in children, with respondents recalling visits to AIDS wards and graphic pictures of AIDS victims:

When I first heard of HIV it was the scariest disease that anyone could think of, it was even scarier than cancer. (Respondent, KZN)

Despite advances in HIV treatment, formative childhood experiences conditioned many of the men to associate HIV with death and to avoid the topic reflexively.

Navigating an environment of stress and uncertainty

Many of the men reported living with a high level of daily pressure and anxiety, including financial difficulties, experience of violence, and the pressure of providing for their families, often without steady employment. This meant that HIV was a less immediate concern, and often ranked low in their order of priorities. Men frequently expressed concern about the indirect costs of HIV testing and treatment, including the time it takes to visit a clinic:

Queuing at the clinic is the reason men don't like going there. Men don't have time to sit there. (Respondent, KZN)

Many men reported acute economic pressure and few had stable employment. Most said that they hustled daily to make ends meet by seeking ‘piece jobs’, and they spoke of the uncertainty of not knowing how long their current job would last or when the next job would come. They also

frequently reported experiencing violence, both as victims and perpetrators, within and outside the home, and often associated with excessive alcohol use.

For the respondents, HIV was another source of stress in their already stressful environment, and therefore a topic often avoided. At the same time, the stressors in the men's lives sometimes acted as triggers for unhealthy ‘escape’ behaviours that exacerbate HIV risk:

I often feel sad. It is because of being unemployed. I usually go and speak to my friends and discuss the progress of our projects. Sometimes I smoke dagga with my friends and maybe get a beer or two, get drunk, and go to my girlfriend. (Respondent, MP)

Masculine norms and risk assessment

Respondents often characterised social norms around manhood as being rigid and restrictive. The men's attempts to comply with these norms may inhibit health-seeking behaviour and contribute to increased risk of HIV transmission.

The men provided many definitions of masculinity and what it means to be a man in their community, but the concept of self-reliance and the notion of providing for others were dominant themes:

It is important for a male figure to take responsibility, to be a provider in our homes. (Respondent, KZN)

This emphasis on self-reliance inhibited many of the men in the sample from presenting at clinics out of fear of being seen as ‘weak’:

Men don't take men who take medication or tablets every day seriously. There is a mindset that men are naturally strong. (Respondent, KZN)

Men also described norms of masculinity in the context of relationships. Having multiple partners was simultaneously viewed as shameful, desirable and inevitable. Men reported hiding additional partners from their wives or main girlfriends, and feeling some level of shame about these side relationships. However, they also described these additional relationships as a way to build social capital. One respondent observed:

There is a lot of peer pressure [to have multiple girlfriends], like when chilling with the guys, one would ask: ‘When did you last have sex?’, or ‘How many girlfriends do you have?’. Then you start feeling like having one girlfriend is not cool. (Respondent, KZN)

The ubiquity of multiple sexual partners, combined with low and inconsistent condom use, contributes to a high level of HIV transmission risk. Many men reported that if they use condoms at all, this tends to fall away quickly with a new

partner. While they initially perceive a high level of risk with a new partner, particularly a casual partner, that perception of risk can quickly reduce due simply to familiarity and the belief that she 'is a nice girl', 'lives a decent lifestyle', or 'comes from a good family'. Many men also believed that they could assess a woman's HIV status using visual clues such as weight and body shape:

If I have sex with someone then I think I won't get sick if she is beautiful. I can tell the difference between a sickly person and one who is not sick. (Respondent, MP)

The men reported being less likely to use condoms with a woman they assumed to be 'healthy' and HIV-negative.

Social and cultural norms around masculinity inhibited men in the sample from taking meaningful steps towards health-seeking behaviour, such as visiting health facilities, taking medication, assessing HIV risk accurately, and using condoms consistently.

Cost versus benefit of engaging with HIV services

Many men associated HIV services with expected loss and little corresponding gain. Expected loss took many perceived forms for them, including but not limited to the following:

Loss of relationships

For the men in the study, disclosure involved not just one's sexual partner(s) but also one's family, friends, co-workers, and the broader community. Disclosure also extended beyond verbally sharing an HIV diagnosis to include being seen at a clinic, or having a partner or family member discover anti-retroviral (ARV) medication.

Many men said that if they discovered they were HIV-positive, it would mean serious and sustained conflict with their primary partner, or perhaps even loss of the relationship. Disclosure to the main partner could become a major source of anxiety, both prospectively when considering testing, and after a positive diagnosis.

With family members, the dominant emotion was often fear of causing disappointment:

I tried telling my mom [about my HIV diagnosis] but I couldn't go through with it. She believes in me and I didn't want to lose that. I've seen this happen to other people and I didn't want it for myself. (Respondent, KZN)

With friends or peers, the primary consideration was generally loss of status and respect in the peer group, although there was little indication in the research as to whether this fear was justified or whether it was a result of men's anxieties.

Loss of pleasure

An HIV diagnosis can trigger fears that the few pleasures men have will be taken away. Men frequently reported that post-test counselling following an HIV diagnosis focused on deprivation: reducing one's number of sexual partners, drinking less alcohol, eliminating unhealthy foods, and avoiding traditional healers. Combined with taking daily medication, many respondents viewed the anticipated change in lifestyle as fraught with loss:

We are afraid of the responsibilities that follow finding out, for example, having to stop alcohol. (Respondent, KZN)

Loss of life

Although most respondents knew that effective HIV treatment was available, they associated HIV with sickness and death, and this impression often remained strong:

They say that once you get the news that you are positive, you die quickly. (Respondent, MP)

Loss of identity and sense of self

Some men equated contracting HIV with a complete loss of self:

I would be worried if they told me that I am indeed positive, then it will be game over. I will no longer be myself. (Respondent, KZN)

Interactions with the healthcare system

The clinical environment exacerbates men's fears. Healthcare providers have their own set of traumas, anxieties and pressures around HIV; they also operate in a difficult environment and reported numerous issues with the health system. This means that encounters between men and HCPs are often sub-optimal. In this section, the analysis includes responses from the men interviewed but also responses from the HCPs in the study in order to understand how the interactions between these two groups may lead to frustration and disengagement.

Mutual distrust and misunderstanding

A comparison between the interviews with the men and those with the HCPs showed that each group often approaches the other with suspicion and expectation of conflict or difficulty, often borne out of past experiences, which can then become self-fulfilling or self-perpetuating. Several moments of disconnection were identified in the analysis, namely when men and HCPs appeared to misunderstand each other's intentions.

Healthcare providers in the sample reported consistently that they found their male patients much more difficult to manage than their female patients, characterising them as 'evasive', 'stubborn', 'ignorant', 'self-interested', 'controlling' and 'disrespectful'. Taken in conjunction with what men reported, it is likely that HCPs are misreading their male patients' demeanour. What HCPs view as apathy or stubbornness, could be fear covered by a veneer of

bravado. Many men reported extreme levels of anxiety when going for testing, borne of expectations of poor treatment, and fear of an HIV diagnosis and of being seen by community members:

I was terrified. I was not ashamed or embarrassed. I was just terrified. (Respondent, KZN)

Many men described HCPs as being aloof and uncaring, even verging on punitive:

Men are afraid of going to the clinic, they say they get shouted at. (Respondent, MP)

However, this interpretation of HCP demeanour also misses the full picture. As revealed in the HCP interviews, patriarchal gender norms are inverted in clinical interactions, with mostly female HCPs in positions of authority over male patients. Men's reported behaviour suggests that as they attempt to restore the gender dynamics to which they are accustomed, providers may have to deal with threatening behaviour and overt sexism. Experiences of violence were common among HCPs, particularly among those working in community settings:

Sometimes you get turned back and rejected the moment you step into somebody's yard. Sometimes they threaten to have the older boys in the neighbourhood remove you, all because they don't want to get tested. So we do feel threatened this way. (Community Health Worker, MP)

Healthcare providers also reported various other pressures and constraints, including high patient volume, unattainable targets, burdensome paperwork requirements, and problems with supplies and human resources:

Sometimes the healthcare system fails me. You sometimes order stuff only to find that it is out of stock. (Nurse, MP)

Behaviour that men view as uncaring or punitive may in fact be a reaction to the adverse circumstances in which HCPs find themselves.

Provider-initiated testing and same-day initiation

A comparison of answers between the two sample subgroups showed that provider-initiated testing can be a source of tension between men and HCPs. Several men reported that they disliked being approached for testing when they were at the clinic for an unrelated reason:

I don't like the fact that when I go in for a headache the nurse will ask me when I last tested for HIV and then I will be compelled to test even though that's not what I came in for. (Respondent, KZN)

While HCPs have a mandate to encourage HIV testing and same-day initiation, many men experience this as being pursued or hunted.

Counselling

The counselling provided before and after an HIV test can be a point of disconnection between the provider and the patient. HCPs tended to describe counselling as an absolute necessity:

I have to explain to patients what HIV is and what AIDS is because people do confuse the two. I have to tell them how the procedure will go and how to read the results. (Nurse, KZN)

Men, however, were not positively predisposed toward any form of counselling and expressed resentment that the results were being delayed by the counselling:

I didn't want to talk, I just wanted to know the results. I was anxious to know the outcome. (Respondent, MP)

Many men experienced counselling as moralising and judgemental, and described the language used as overly technical. Messages were often scripted and didactic rather than tailored to individual needs and circumstances. Counselling often reinforced the fears men had about testing positive, with messages focusing on everything that a man must give up rather than how to continue living an enjoyable life:

They also told me not to take [my pills] with any traditional Zulu drinks, that I must take them on their own. When I was told that I was a little heartsore because I am a traditionalist. (Respondent, KZN)

Privacy and confidentiality

Privacy and confidentiality were overriding concerns for many men, who feared that their status would be revealed by indiscreet HCPs or through being seen at the clinic:

A lot of people hate the idea of sitting around at the clinic in queues and hate the fact that their friends might see them there. If they see you there they start to gossip. (Respondent, KZN)

However much HCPs may wish to safeguard confidentiality, the physical set-up of the clinic can make this difficult:

In the consultation room there's two of us doing counselling; when we're both busy we have to split the room with a screen. People come in to use the computer, to print results or whatever, so you see there is no longer any privacy. (Community Health Worker, KZN)

The clinic experience is often sub-optimal for both men and HCPs. In an environment of stringent targets and resource shortages, compounded by threats of violence, HCPs may lose sight of the anxieties that men bring to the clinic. Similarly, men may misread HCP behaviour as being uncaring, rather than as stemming from the pressures of their work situation.

Conclusions and recommendations

This research considered men's life context, their full physical and emotional journey to testing and treatment, and the relationship between men and HCPs, and uncovered contextual and environmental factors, as well as more practical barriers that block testing and linkage to treatment. While this qualitative study did not test interventions, the findings point to some practical recommendations that could improve the experiences of both patients and HCPs. This work therefore contributes to the evidence base behind the 'service delivery' and 'health workforce' elements of the World Health Organization's six building blocks for an effective, efficient and equitable health system.²¹

Given the qualitative nature of the study, these recommendations may not be applicable to the country as a whole. Instead, they should be read as potential areas for further investigation and research, or suggestions that could be piloted in a practical setting.

- **Services should take a harm-reduction and empathetic approach**

Service providers should reframe testing and treatment services in ways that relieve fear and anxiety, offer acceptance and support, provide a greater sense of control over personal health decisions, and create safe spaces for honest discussion. The public health community may have limited impact in trying to change deeply entrenched attitudes and behaviours around masculinity. Scarce resources may be better spent on emulating key population programmes by taking a harm-reduction approach that focuses on helping men to reduce risk in realistic ways, while taking their fears and motivations into account. For example, discussions around treatment could be more interactive and clearly communicate prevention benefits. Rather than focusing on what men must not do, ART counselling could focus on how to live a fun, fulfilling life and not just a long, healthy one, and how to make it easier to incorporate ART into daily life.

- **Services should understand HCP barriers and challenges**

Many HCPs have also experienced HIV trauma and stigma, and face numerous challenges in their work, including stock and staff shortages, high administrative burdens, ambitious targets, and threats of violence. Both government and funders should prioritise the needs of patients and providers above reporting and administrative priorities. Healthcare providers should receive supportive training, both to foster deeper understanding of the populations they serve, and to prevent and cope with physical dangers encountered in their work.

- **Services should be as responsive and relatable as possible**

There can be difficulties around gender norms and sexism when interactions rest on acceptance of patriarchal patterns of male superiority and female inferiority and passivity. Similarly, there can be difficulties with sex-segregated services, even though these can be effective in certain contexts. In such environments one should be careful about making dogmatic suggestions. Nevertheless, clinics and providers could and should do more to create a comfortable, familiar environment where men feel seen and respected. Simply orienting men on what to expect during a clinic visit could assist, and active listening could help to address individual barriers and challenges and improve perception of respect and responsiveness. Rather than responding punitively, empathising with non-compliant 'problem patients' could increase adherence and retention.

- **Services should prioritise privacy, confidentiality and disclosure support**

Among men's fears, disclosure ranks high (especially unintentional disclosure). Clinics should be structured so that the testing and treatment process is as private and inconspicuous as possible, and clinic managers should stress and enforce principles of patient confidentiality with staff. Particularly in the case of index testing, providers should be trained to offer disclosure support in a range of forms, including assisted partner notification and anonymous notification, as is routinely done with other sexually transmitted infections.

These recommendations are not prescriptive or exhaustive. Additional quantitative research is needed to investigate barriers and solutions. The data will then feed into an intervention design process, the results of which will be piloted in KZN and MP.

Understanding and addressing men's barriers to HIV testing and treatment will have many benefits, including improved health and longevity for men, reduced community viral load and lower HIV transmission to female partners, and a strong, more resilient healthcare system in South Africa. However, challenges still remain, including adherence when treatment is begun, and many of the identified barriers (such as the impact of gender norms and economic difficulties) are complex and will require multiple interventions to secure long-term benefits.

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A landscape analysis of preterm birth in South Africa: systemic gaps and solutions

Authors

Vundli Ramokoloⁱ
Thokozile Malabaⁱⁱ
Natasha Rhodaⁱⁱⁱ
Shuaib Kauchali^{iv}
Ameena Goga^{i,vi}

Lack of accurate nationally representative preterm birth estimates limit our epidemiological understanding of this syndrome and the extent to which health services can respond appropriately.

The World Health Organization defines preterm birth (PtB) as delivery before 37 completed weeks of gestation. PtB affects 15 million infants worldwide annually. In 2014, Asian and sub-Saharan African regions accounted for 81.1% of this burden. The true national burden of PtB in South Africa is unknown: current estimates rely on hospital mortality data and projections. Furthermore, current estimates are subject to bias as gestational age is mostly estimated using the last menstrual period and symphysis-fundal height measures instead of an early ultrasound. Lack of accurate nationally representative PtB estimates limits our epidemiological

understanding of PtB, and the extent to which health services can respond appropriately.

Using data obtained from national data sets, e.g. the Perinatal Problem Identification Programme, experts, and published papers, this chapter highlights the estimated global, regional and local burden of PtB, challenges with measuring gestational age, PtB-associated complications, and optimal care packages. The chapter also addresses key interventions that prevent and predict PtB, and interventions to manage preterm infants.

i Health Systems Research Unit, South African Medical Research Council
ii Centre for Infectious Disease Epidemiology and Research, Division of Epidemiology and Biostatistics, School of Public and Family Medicine, University of Cape Town
iii Neonatal Medicine, Mowbray Maternity Hospital, Department of Paediatrics and Child Health, University of Cape Town
iv National Department of Health
v HIV Prevention Research Unit, South African Medical Research Council
vi Department of Paediatrics, University of Pretoria

Introduction

The World Health Organization (WHO) defines preterm birth (PtB) as delivery before 37 completed weeks of gestation, or fewer than 259 days from the first day of a woman's last menstrual period.¹ This syndrome affects 15 million infants worldwide annually, with implications for short- and long-term morbidity, mortality and socio-economic liability.² Global PtB estimates were 9.8% in 2000,³ 9.6% (2005), 11.1% (2010)⁴ and 10.6% (2014).³ Low- and middle-income countries (LMICs) bear the burden of PtB (81.1% of PtB occurs in sub-Saharan Africa and South Asia). The PtB burden in South Africa is unknown. Modelled estimates reported it at 8 per 1 000 live births in 2010⁴ and 12.4 (uncertainty range 8.6 - 17.1) per 1 000 live births in 2014.³

This chapter addresses challenges with estimating PtB burden at population level; PtB classification systems; associated morbidity and mortality; and care packages. Key recommendations are made at the end of the chapter.

Challenges with population-level estimations of preterm births

PtB estimation is complicated by lack of data availability, and inconsistency between PtB definitions across sites.^{3,5}

In LMICs, data from national civil registration and vital statistics (CRVS) systems and national research studies are not collected routinely, thus country-level PtB estimations rely on the few non-representative research studies. Therefore, global PtB estimations are influenced disproportionately by high-income countries (HICs) with robust monitoring systems. South African PtB estimates were derived from two studies in 2010^{6,7} and four studies in 2014.⁸⁻¹⁰ However, determining PtB incidence was not the primary research objective in these studies, necessitating cautious interpretation of the estimates.¹¹

The WHO PtB definition includes all live births (births with "any signs of life within the first hour of life").¹² While the upper gestational age (GA) cut-off (<37 weeks) is well defined, the lower limit varies depending on the limit of viability (20 - 28 weeks), i.e. the GA at which 50% of infants born will have a reasonable chance of survival.¹³ This limit depends on availability of interventions for extremely preterm births (ePtB) (<28 weeks GA) or extremely low birth weight (ELBW) neonates (<1 000 g). In well-resourced HICs the ePtB survival rate has increased significantly,¹⁴⁻¹⁶ decreasing the limit of viability to ~24 or 25 weeks. In a LMIC such as South Africa, this limit is >27 weeks' GA. Therefore, no uniform international GA cut-off point exists to define viability, restricting direct comparability of PtB rates across settings.²

Other definitional problems include misclassification stemming from two challenges, namely errors in GA assessment and reporting, and misclassification of live births as stillbirths.¹⁷⁻²⁰

Assessing and classifying preterm birth

PtB is a complex syndrome with varying phenotypes.²¹ Traditional classification systems stratify PtB according to GA, clinical presentation, and pathophysiological pathways.^{20,22} Classifications based on GA are most commonly used because GA correlates strongly with foetal maturity and all developmentally regulated processes and is a good predictor of short- and long-term outcomes.²³

Classifying preterm birth by gestational age

In addition to the arbitrary PtB definition of <37 completed weeks,²⁴ further subdivisions distinguish ePtB, very early PtB (28 - <32 weeks), moderate PtB (32 - 34 weeks), and late PtB (34 - 36 weeks).

GA can be determined according to pregnancy duration from date of last menstrual period (LMP), foetal size assessed using ultrasonography or symphysis-fundus height (SFH) measurements or postnatal clinical assessment methods. GA assessments performed earlier in pregnancy are more accurate, with early antenatal ultrasound (<24 weeks) considered the gold standard (accuracy of $\pm 5 - 7$ days).²⁵ In LMICs, ultrasonography access tends to be limited to tertiary-level facilities and private practice, and first antenatal care (ANC) bookings are usually in the second trimester. Therefore, most pregnancies are dated using the LMP, SFH and postnatal clinical assessments, which may be incorrect by four weeks or more compared with ultrasonography.²⁵ A recent pregnancy cohort study in a routine primary healthcare facility in the Western Cape showed variations in GA assessment resulting in significantly different PtB incidences when LMP (36%), SFH (17%), and ultrasound (11%) methods were used.²⁶

Where GA data are not available, particularly in resource-limited settings,²⁷ proxy postnatal measures are used, such as low birthweight (LBW), birthweight <2 500 g, or foot length.²⁸ Although these are useful to guide clinical management, they are less useful for accurately determining PtB status as a proportion of LBW infants are intrauterine growth restricted (IUGR) full-term infants, and thus small-for-gestational age (weight less than the 10th percentile for sex and GA) (SGA).²⁹ Furthermore, infants born ≥ 2 500 g are not all full term.³⁰ Consequently these proxy measures fail to distinguish between infants born too small (constitutionally small but normal, or pathologically small at term because of IUGR) and those born too soon (i.e. PtB), outcomes that have different aetiologies.³¹

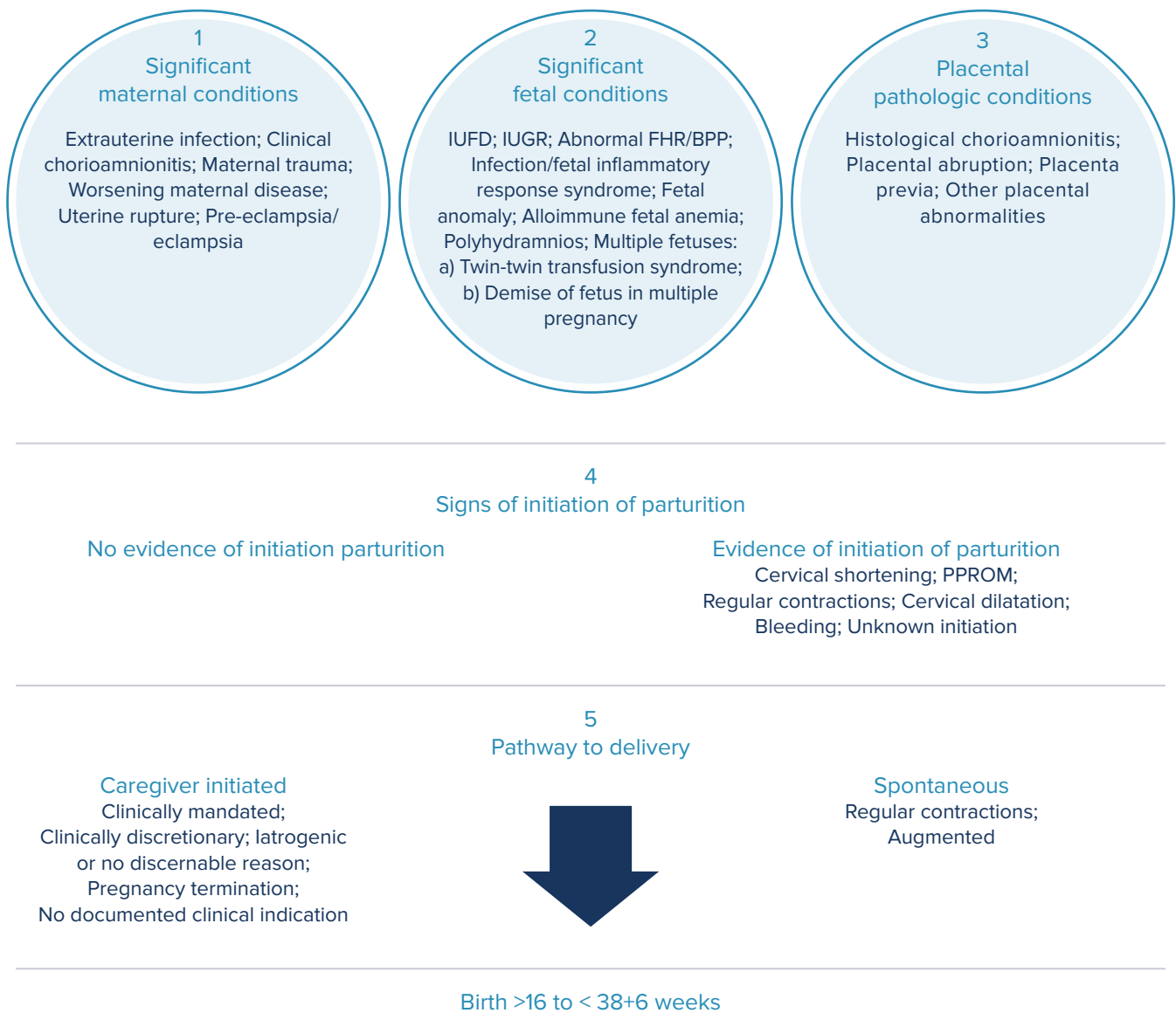
Determining preterm birth: phenotypic classification

PtB can be classified phenotypically^{32,33} into spontaneous and medically indicated PtB. These have considerable aetiological heterogeneity needing different screening, prevention, and treatment strategies.³⁴ Spontaneous PtB (SPtB) can be due to preterm labour (PTL), with cervical dilation or preterm prelabour rupture of membranes (PPROM). Medically indicated PtB through labour induction and/or caesarean delivery are frequently due to maternal factors (e.g. preeclampsia) or foetal factors (e.g. IUGR and foetal distress).^{22,35,36} Classification can also be based on placental pathology and postulated physiological mechanisms.²⁰

Villar and colleagues proposed a five-component phenotype classification that distinguishes between SPtB and medically indicated PtB (Figure 1).³³

Subsequently, a nine-phenotype SPtB classification system was developed to facilitate identification of more specific aetiologies, namely infection/inflammation, decidual haemorrhage, maternal stress, cervical insufficiency, uterine distention, placental dysfunction, PPROM, maternal co-morbidities, and familial factors.³² However, given the human and infrastructural capacity required to apply this classification it is better suited to well-resourced settings or research studies.

Figure 1: A comprehensive, sophisticated phenotypic classification system to improve understanding of the preterm birth syndrome



Source: Villar et al., 2012.³³

BPP = biophysical profile; FHR = foetal heart rate; IUFD = early intrauterine foetal death; IUGR = intrauterine growth restriction; PPROM = preterm premature rupture of membranes.

Morbidity in preterm infants

In LMICs, the exact prevalence of PtB, ePtB and ELBW infants is not known. Estimates are that 12.4 per 1 000 live births are preterm; fewer will be ELBW. PtB and ELBW infants are at risk of morbidity and given the Sustainable Development Goals (SDGs)³⁷ and Global Strategy for Women's, Children's and Adolescents' Health,³⁸ efforts are needed to ensure that children survive and thrive. In South Africa, a hospital-based retrospective study showed short-term adverse outcomes among PtBs, such as respiratory distress syndrome, necrotising enterocolitis, bronchopulmonary dysplasia, intraventricular haemorrhage, sepsis, feeding difficulties, and auditory and visual difficulties.³⁹ No studies have documented medium-to-long-term outcomes of PtB, highlighting a key gap in the guidance of medium - and long-term prevention, care and treatment.

Mortality in preterm infants

Preterm birth complications form one of the leading causes of under-five mortality (U5M) globally,⁴⁰ and the leading cause of neonatal deaths (NNDs),⁴¹ accounting for 14.4% of U5M in 2015 (Figure 2).⁴² Neonatal deaths are also

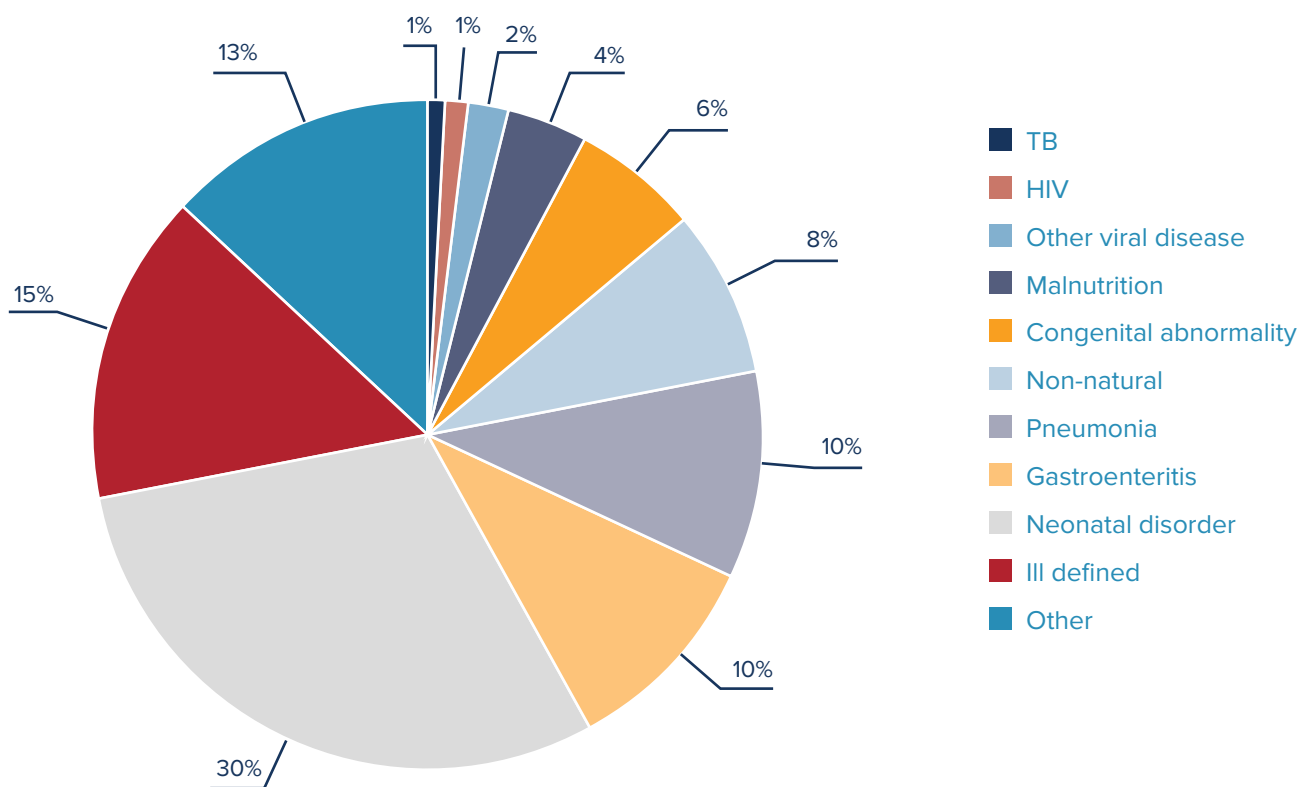
indirectly caused by LBW, a product of PtB and/or SGA.⁴³ Data also show that regardless of weight, most stillbirths are unexplained, whereas most early NNDs are due to SPtB, particularly in the 28 - 33-week period (Figure 3).

A major cause for concern is that since 2000, the overall neonatal mortality rate (NMR) has remained unchanged (Figure 4). In South Africa, the NMR among newborns weighing >1 000 g declined from 8.8/1 000 live births in 2000 - 2002 to 8.5/1 000 in 2015 - 2017, which is close to the South African target of 8/1 000 livebirths⁴⁴ (Table 1).

These data highlight the success of improved intensive care for infants weighing >1 000g. However, ELBW infants constitute 60% of PtB mortality in South Africa.⁴⁵ Among ELBW infants, survival is highest if birth weight is >900g, while survival is <60% if birthweight is <800 g, even in well-resourced tertiary hospitals (Table 2).

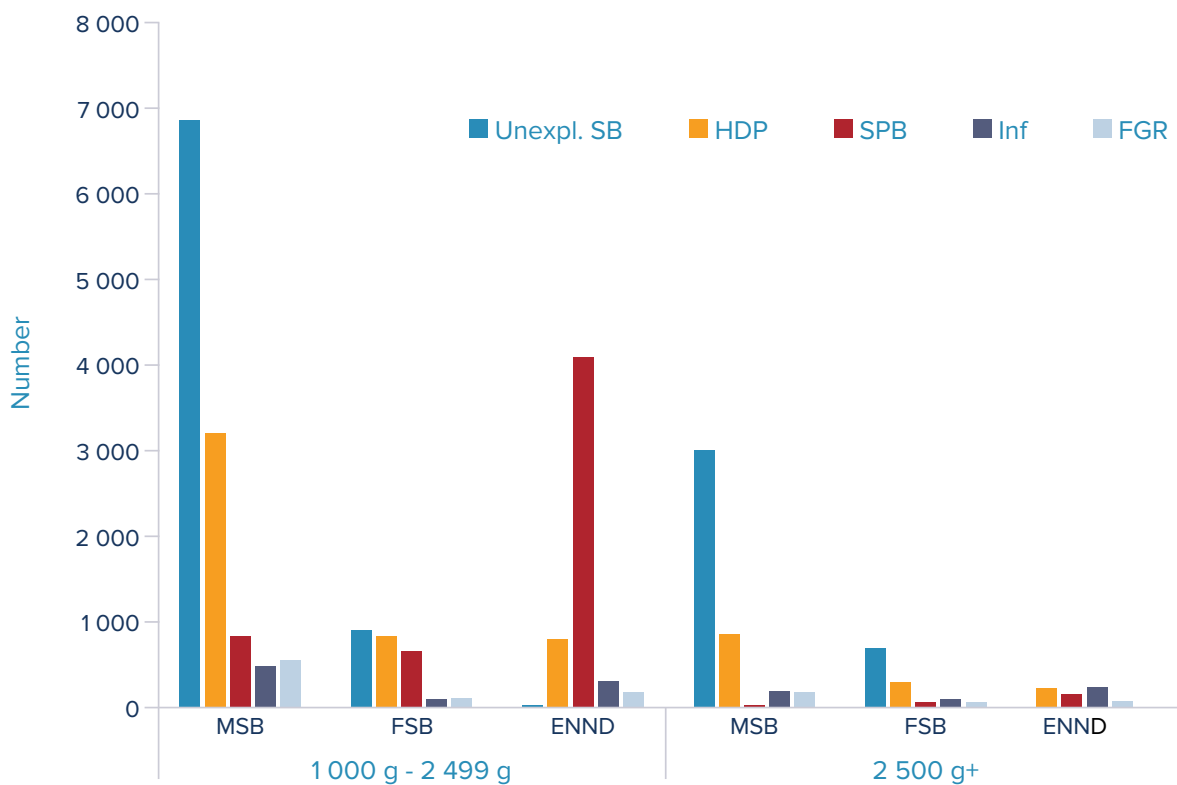
Given current resource constraints, and demand for neonatal intensive care beds, it is unlikely that the South African public health system has the capacity to provide highly resource-intensive specialised care for VLBW infants. Their survival depends on timely referral to facilitate delivery in tertiary settings, necessitating a responsive and expansive health system.⁴⁶ Particularly in rural settings, such as Limpopo and Mpumalanga provinces, neonatal survival rates depend on the quality of district-level neonatal care.

Figure 2: Causes of death in children aged under five years in South Africa, 2015



Source: NDoH, 2017.⁴²

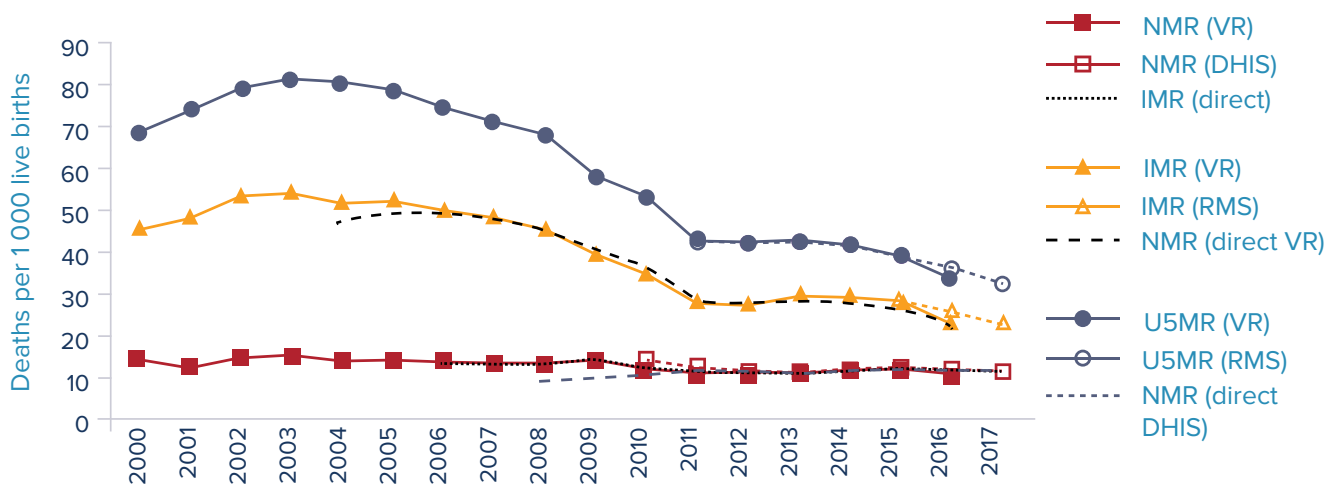
Figure 3: Comparison of stillbirths and early neonatal mortality per weight category, South Africa, 2015 - 2017



Source: Perinatal Problem Identification Programme (PPIP): 2015 - 2017.^a

ENND = early neonatal death; FGR = foetal growth retardation; FSB = fresh stillbirth; HDP = hypertensive disorders of pregnancy; Inf = infection; MSB = macerated stillbirth; SPB = spontaneous preterm birth; Unexpl. SB = unexplained stillbirth.

Figure 4: Under-five, infant and neonatal mortality rates in South Africa, 2000 - 2017



Source: Dorrington et al.; 2019.⁴⁴

DHIS = District Health Information Software; IMR = infant mortality rate; NMR = neonatal mortality rate; RMS = rapid mortality surveillance; U5MR = under-five mortality rate; VR = vital registration.

a Personal communication: Robert Pattison, PPIP, 10 April 2019.

Note: PPIP (<https://www.ppip.co.za/>) is an audit tool for perinatal mortality at facility level and captures data for 80% of national public sector deliveries and mortality.

Identifying risk factors for preterm birth

In South Africa, key maternal factors for both SPtB and medically indicated PtB include smoking, alcohol and illicit drug use, low socio-economic status, and illegal termination of pregnancy (Figure 1). Hypertensive disorders of pregnancy (HDP) are also strongly associated with SPtB and stillbirths (Figure 3). Furthermore, 30.8%⁴⁷ (approximately 300 000 live births annually)⁴⁸ are HIV-exposed in South Africa, increasing the risk of PtB in HIV-exposed compared with HIV-unexposed children secondary to HIV infection,^{49,50} or maternal antiretroviral treatment (ART) regimens, especially those including protease inhibitors.^{51,52} Data also indicate that HIV-positive women on ART have more HDP, such as pre-eclampsia,⁵³ and suggest that this may be due to immune reconstitution due to ART.⁵⁴ Further research, using rigorous study designs with robust measures and procedures, such as prospective cohort studies, is required to understand the interaction between exposure to maternal HIV/ART and PtB.

Clinical and public health interventions to prevent and manage preterm birth

While South Africa does not have a stand-alone PtB policy, the Strategic Plan for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa 2012 - 2016 included key interventions for saving the lives of mothers and infants (Box 1).⁵⁵ Given the complex interaction of risk factors, prevention and prediction of PtB and management of short and long-term health effects requires a suite of interventions that must commence pre-conception (Table 3).^{56,57}

Some recommended actions (e.g. kangaroo mother care (KMC) for LBW infants) are applicable to PtB infants. Box 2 describes the implementation of KMC as an illustrative example.

Table 1: Stillbirth, perinatal and neonatal mortality rates among children with birthweights >1 000 g in South Africa, 2000 - 2017

Period	Perinatal mortality rate (/1 000)	Neonatal mortality rate (/1 000)	Early neonatal mortality rate (/1 000)	Late neonatal mortality rate (/1 000)	Stillbirth rate (/1 000)
2000 - 2002	26.3	8.8	8.1	0.7	18.4
2003 - 2005	25.8	9.1	8.1	0.9	17.8
2006 - 2008	25.6	9.9	8.3	1.6	17.4
2009 - 2011	25.9	9.7	8.1	1.6	17.9
2012 - 2014	23.6	8.3	7.0	1.3	16.7
2015 - 2017	22.6	8.5	6.6	1.9	16.1

Source: PPIP. Note: PPIP does not capture GA so data are reported in birth weight categories. Personal communication: Natasha Rhoda, University of Cape Town, 30 July 2019.

Table 2: Percentage survival to discharge among VLBW infants in selected tertiary hospitals in South Africa, 2000 - 2009^a

Birth weight	Year	Survival to discharge (percentage)	Hospital
800 - 899 g	2000 - 2002	37%	Chris Hani Baragwanath, JHB
	2006 - 2010	38%	Charlotte Maxeke Academic, JHB
	2017	69%	Tygerberg Hospital, Cape Town
750 - 900 g	2013	64%	Groote Schuur Hospital, Cape Town
750 - 900 g	2013	52%	Charlotte Maxeke Academic, JHB
500 - 749 g	2007 - 2009	56%	Tygerberg Hospital, Cape Town

Source: Ballot et al., 2015.³⁹ VLBW = very low birth weight.

a Personal communication: Dr Lloyd Tooke, University of Cape Town, and Professor Johannes Smith, Stellenbosch University, 20 May 2019.

Antenatal steroids have been shown to reduce neonatal mortality by 30% and to decrease the complications of PtB, including bronchopulmonary dysplasia, respiratory distress syndrome and necrotising enterocolitis.⁴⁶

Table 3 includes an additional set of high-impact, low-cost interventions currently being implemented in the South African healthcare system. The current coverage rate for essential newborn care interventions is unknown, including interventions targeted at PtB infants.

Table 3: Interventions identified in the literature to predict, prevent and manage preterm birth optimally

Location	Type of intervention			
	Prediction	Prevention	Management of PtB	Management of preterm infants
At all levels from community to health facility		<ul style="list-style-type: none"> Prevent unwanted pregnancies and promote pre-conception health Interventions for alcohol and illicit drug use Health promotion interventions to address chronic diseases; and HIV and STI prevention, screening and management Nicotine replacement therapy 	<ul style="list-style-type: none"> In utero transfer to health facilities with a NICU Skilled birth attendants Family/partner support during labour 	<ul style="list-style-type: none"> Cord care and delayed cord clamping Kangaroo Mother Care Hypothermia prevention Exclusive breastfeeding support within the first hour of delivery and in the first 6 months, and continued breastfeeding until 2 years
Facility level	<ul style="list-style-type: none"> Risk factor assessment, including maternal malnutrition, maternal age >35 years, multiple pregnancies, previous PtB, short birth spacing, and substance abuse 	<ul style="list-style-type: none"> Lower genital tract infection screening and treatment Screen for maternal infections associated with PtB Maternal antibiotics for prevention of infection (e.g. pneumonia) associated with PtB Nutritional supplementation for pregnant women (e.g. zinc for pregnant women or calcium for women with hypertension)^b 	<p>Regional hospital level:</p> <ul style="list-style-type: none"> Administer maternal tocolytics to delay delivery until mother reaches health facility with NICU facilities Administer antepartum glucocorticoids Low-dose aspirin for preeclampsia prevention Skilled birth attendants (e.g. midwives) Family/partner support during labour Management of preterm labour: treatment with antenatal steroids Antibiotics to prevent sepsis in PPRM 	<ul style="list-style-type: none"> Preventive surfactant therapy for preterm neonates CPAP for respiratory distress syndrome Management of neonatal infections
	<p>Regional/tertiary level:</p> <ul style="list-style-type: none"> Ultrasonographic cervical length assessment Foetal fibronectin testing^a Inflammatory proteins in maternal serum,^b amniotic fluid,^b cervico-vaginal fluid^a Biomarker testing^c Serum proteomic testing^c Genomic DNA testing^c 			

Sources: Alfirevic et al., 2017;⁵⁸ Bhutta et al., 2014;⁵⁶ Jarde et al., 2019;⁵⁹ Lamont, 2019;⁶⁰ Medley et al., 2018.⁵⁷

CPAP = continuous positive airway pressure; NICU = neonatal intensive care unit; PPRM = preterm premature rupture of membranes.

- a Only available in private facilities
- b Only for spontaneous preterm birth
- c Only in research study settings

Box 1: Priority health interventions recommended to reduce maternal and neonatal mortality, South Africa, 2012 - 2016

Maternal health

- Basic antenatal care (four visits for every pregnant woman, beginning during the first trimester*).
- HIV testing during pregnancy, with initiation of ART and provision of other prevention of mother-to-child transmission (PMTCT) services where indicated.
- Improved access to care during labour through introduction of dedicated obstetric ambulances and establishment of maternity waiting homes (where appropriate).
- Improved intrapartum care (with specific focus on correct use of the partogram, and standard protocols for managing complications).
- Postnatal care within six days of delivery.

Newborn health

- Promotion of early and exclusive breastfeeding, including ensuring that breastfeeding is made as safe as possible for HIV-exposed infants.
- Provision of PMTCT.

- Resuscitation of newborns.
- Care for small/ill newborns according to standardised protocols.
- KMC for stable LBW infants.
- Postnatal visit within six days, which includes newborn care and supporting mothers to practise exclusive breastfeeding.

Community interventions

- Provision of a package of community-based MNCWH services by generalist community health workers working as part of ward-based PHC outreach teams.
- Multi-sectoral action to reduce poverty and inequity, and improve access to basic services, especially improved water and sanitation.
- Development of a MNCWH communication strategy.

*As of 1 April 2017, this has been increased to eight antenatal visits.⁶¹

Source: NDoH, 2012.⁵⁵

Box 2: Kangaroo mother care: implementation of a key intervention

KMC is a high-yield, low-tech, cost-effective intervention for addressing morbidity and mortality in PTB neonates.⁶² Within the public sector, KMC was first initiated in hospitals in KwaZulu-Natal, Gauteng and Mpumalanga provinces.⁶³ The Western Cape, an early adopter, published its first KMC policy in 2002⁶⁴, and updated it in 2011.⁶⁵ In 2002, Limpopo Province strengthened its KMC uptake through the Limpopo Initiative for Neonatal Care (LINC).^d Although KMC is embedded in several MNCWH strategic plans and policies (including the Saving Babies Report 2000,⁶⁶ the Tshwane Declaration,⁶⁷ the Strategic Plan for MNCWH and Nutrition in South Africa 2012 - 2016,⁵⁵ and the National Strategic Plan for a Campaign on Accelerated Reduction of Maternal and Child Mortality

in Africa⁶⁸), implementation is uneven within the South African public healthcare system, and no private healthcare facility currently offers KMC, due to the high cost of residential care for mother-baby pairs.

Other factors affecting KMC implementation include lack of equipment and supplies to provide appropriate patient treatment; bottlenecks in leadership and governance; disparate healthcare worker knowledge, skills and attitudes;⁶⁹ inadequate planning for neonatal care; inadequate buy-in from some healthcare workers, parents and community members; insufficient time for some caregivers to administer KMC; and misalignment between KMC and some cultural norms.⁷⁰

d Personal communication: Ann-Marie Bergh, University of Pretoria, 1 August 2019.

Conclusions and recommendations

PtB requires a package of interventions targeting prevention, diagnosis and short- and long-term management. While many of these interventions are included in South African policy documents, uptake varies across settings.

The South African Every Newborn Action Plan outlines five strategic objectives to reduce PtB.⁷¹ These include the need to:

- Address barriers to reducing PtB;
- Strengthen best practices for PtB reduction;
- Strengthen accountability at all levels of the health system using regular auditing and reporting processes;
- Identify and include key quality and coverage indicators in the DHIS to assess the impact of interventions; and
- Improve community awareness through campaigns.

In addition to the above, we recommend the following:

- Address the equipment and supplies gap in the public sector by prioritising financial resources for key interventions such as KMC at national and sub-national levels.
- Address leadership and governance challenges that affect quality of care by ensuring buy-in from all key actors, including community leaders and health programme managers. Such buy-in can be strengthened through frequent awareness campaigns on the importance and effectiveness of key neonatal interventions.
- Provide appropriate training, support and supervision for healthcare workers to enable them to address bottlenecks in the system.
- Prioritise the following research areas:
 - Early diagnostic tools/approaches for women at high risk of PtB in the community.
 - Short- and long-term effectiveness of interventions to prevent, predict and manage PtB.
 - Barriers and enablers for the delivery of proven key interventions.
 - Short- and long-term morbidity and mortality associated with PtB, including effect on infants, parents, families and society.
 - Best use of limited resources available to the ELBW population, which constitutes approximately 1% of the newborn population but accounts for 60% of PtB mortality.

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Improving the early development of children through quality health care

Authors

Lesley Bamford^{i,ii}
Patricia Martin^{iii,iv}
Wiedaad Slemming^{iv,v}
Linda Richter^{iv,vi}

Ensuring that the package of services provided during the first 1 000 days is more comprehensive, and includes the services envisaged in the Nurturing Care Framework and the ECD Policy, will require substantial changes in how services are organised, delivered and monitored.

Global initiatives and commitments increasingly emphasise the importance of Early Childhood Development, and its role in ensuring that young children not only survive, but also thrive. Globally, 2017 and 2018 saw several important commitments to increased investment in Early Childhood Development, while the Nurturing Care Framework (launched during the 71st World Health Assembly) provides a multi-sectoral action framework for improving delivery of services to young children and their families. In South Africa, the National Integrated Early Childhood Development Policy, adopted by Cabinet in 2015, lays out a multi-sectoral approach to promoting the health, nutrition, development and well-being of young children.

These commitments recognise the critical role played by the health sector and assign specific responsibilities to the sector, especially with respect to the first 1 000 days of life, starting from conception. This expanded mandate is challenging for the health sector, which has historically focused on providing a package of child survival services, frequently delivered as vertical programmes.

As a first step, the National Department of Health has redesigned the Road to Health Booklet and placed it at the centre of a campaign that aims to promote and support nurturing care. Known as Side-by-Side, the campaign supports parents, caregivers and healthcare workers to provide holistic care to young children and their families. While currently focused primarily on behaviour-change communication, the Side-by-Side initiative also provides a structure for mobilising health workers (especially community health workers) to promote and support a more comprehensive approach to child health and well-being.

In this chapter, relevant global strategies are reviewed, including the Global Strategy for Women's, Children's and Adolescents' Health, the Nurturing Care Framework, and the South African Integrated Early Childhood Development Policy. The chapter reveals how the health system is responding to local and global scientific evidence and policy through the Side-by-Side Campaign. Lastly, an outline is given of the health-system strengthening efforts required to enable the health sector to fulfil the 'survive and thrive' agenda for young children.

i Child, Youth and School Health Directorate, South African National Department of Health

ii School of Health Systems and Public Health, University of Pretoria

iii Advocacy Aid

iv South African Civil Society for Women's, Children's and Adolescents' Health

v Division of Community Paediatrics, Department of Paediatrics and Child Health, School of Clinical Medicine, University of the Witwatersrand, Johannesburg

vi Department of Science and Technology – National Research Foundation Centre of Excellence in Human Development, University of the Witwatersrand, Johannesburg

Introduction

Child survival, growth, health and development are inextricably linked. Children whose mothers are healthy and well-nourished, and who are provided with nurturing care, are more likely to reach their full developmental potential and to lead healthy, productive lives.¹ The period from conception to age 2 - 3 years is a particularly critical and sensitive period in child development, particularly development of the brain, with consequences for adult health and well-being. This period of heightened receptivity and plasticity of the brain is when interventions to promote optimal health and development have the most benefit, when adverse experiences and exposures can exert the most harm, and when early intervention to reduce risks to poor health, growth and development are the most cost-effective.²

Recognition of the importance of the first 1 000 days has coincided with substantial improvements in child survival. Globally, between the years 2000 and 2018 the number of under-five deaths fell from 9.8 million to 5.3 million (and from 77 to 39 deaths per 1 000 live births).³ Improved coverage of maternal and child survival interventions, often provided as vertical programmes, has played an important role in this reduction. However, it is estimated that 43% of children under five years of age (an estimated 250 million children) living in low- and middle-income countries remain at risk of suboptimal development due to poverty and stunting, both established risks to child development.^{2,4,5} A similar situation pertains in South Africa, where under-five mortality fell from 77 per 1 000 live births in 2000 to 37 per 1 000 live births in 2017.³ However, many children fail to reach their full potential, as evidenced by high levels of stunting⁶ and suboptimal educational outcomes.⁷ Recent estimates show that 38% of South African children under the age of five years are at risk of poor development based on their exposure to stunting or extreme poverty.⁸

Improved scientific understanding of the long-term implications of poor growth, adversity and poor nurturing during the first 1 000 days and the context of declining child mortality combine to challenge the health sector to work towards not only ensuring that children survive, but that factors that limit their long-term health and development are addressed. While some of the interventions are not traditionally 'health interventions', the health sector, working in collaboration with other sectors, is best placed to deliver services to pregnant women and young children, especially during the first 1 000 days,^{9,10} and increasingly the expanded mandate of the health sector is being articulated in policy documents and commitments on a global and national level.

This chapter starts by outlining some of the important commitments and initiatives that promote the importance of Early Childhood Development (ECD) for the health sector. These are summarised in Table 1. This provides the background, demonstrating how the South African health

system is responding to local and global scientific evidence and policy through the Side-by-Side Campaign and related efforts. Lastly, an outline is given of some of the health-system-strengthening efforts required to enable the health sector to fulfil the 'survive and thrive' agenda for young children.

Global commitments

The SDGs and global strategy

The Sustainable Development Goals (SDGs) build on the Millennium Development Goals (MDGs) in a changed and more complex world.¹¹ Now, in the digital era, everything is interconnected, including new health threats to humans and the environment, and there is growing inequality. In September 2015, 193 countries agreed to a set of development goals that are bolder and more ambitious than the MDGs. The underlying theme of the 17 SDGs and their 169 associated targets is the commitment to ending poverty, and to leaving no one behind.¹¹ Target 4.2 seeks to ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education; however, childhood development is intrinsic to many of the other goals, most pertinently expressed in SDG 1 (No Poverty), 2 (Zero Hunger), 3 (Good Health and Wellbeing), 5 (Gender Equality), 6 (Clean Water and Sanitation), 10 (Reduced Inequalities) and 16 (Peace, Justice and Strong Institutions).^{11,12}

The goals and targets of the Global Strategy for Women's, Children's and Adolescents' Health 2016 - 2030 (namely to 'Survive, Thrive and Transform') are aligned with the SDGs and designed to emphasise how, if achieved, they will enable SDG commitments.¹³

The Nurturing Care Framework

The Nurturing Care Framework was launched at the 71st World Health Assembly in 2018.¹⁴ It situates ECD in the context of both the SDGs and the Global Strategy and articulates the addition of the 'thrive' and 'transform' dimensions to the 'survive' dimension, as these pertain to young children. Building on the 2017 Lancet Series 'Advancing Early Childhood Development: From Science to Scale',¹⁵ the Framework advances the notion of nurturing care^{2,16,17} to describe what young children need to enable them to survive and thrive, and for their environment to be transformed.

The Framework is based on the five components of nurturing care, namely good health, adequate nutrition, safety and security, responsive caregiving, and opportunities for children to satisfy their innate capacity to learn. For the youngest children, nurturing care is provided by parents and caregivers. However, parents and caregivers need a facilitating and enabling environment of community support, and supportive services and policies to enable them to provide for young children.¹⁴

The Framework advocates for five strategic actions, namely leadership and investment; a focus on families and communities; strengthening of services; monitoring of progress; and improved data and innovation.¹⁷ It also emphasises that the health sector has the greatest reach among parents and young children; that many existing health interventions (e.g. nutritional supplements and Kangaroo Mother Care) have proven benefits for childhood development; and that several examples show that additional interventions, including those that specifically promote ECD, can feasibly and affordably be integrated into or delivered alongside reproductive, maternal, newborn, child and adolescent health services.¹⁶ The health sector should, therefore, not only ensure that women and young children have access to good-quality health and nutrition services, it should also ensure that services are supportive of nurturing care. Services should prioritise families and children at greatest risk of suboptimal outcomes and ensure that children with developmental difficulties and disabilities receive specialised services (Box 1).

The Nurturing Care Framework, together with a progress report on ECD as part of the Global Strategy, and the ECD Countdown Country Profiles,⁷ enable countries to take action in accordance with their priorities, resources and what is feasible. Globally, both ECD and the Nurturing Care Framework have found resonance. At its Argentina meeting, the Group of Twenty (G20) adopted an Initiative for Early Childhood Development.¹⁸ The initiative is convinced that early childhood is one of the most significant and influential phases of life, especially the first 1 000 days, and it underscores the importance of responsive care and early learning and stimulation in the family as the natural and best environment for the growth, development and well-being of children. Further, the G20 calls for increased investment, leadership, monitoring and accountability, and international co-operation and data sharing. In support of the initiative, a recommendation has been made for 1% of gross domestic product (GDP) investment in ECD, with assistance from donors for countries that cannot afford it.¹⁹

Table 1: Key global and national ECD policies and commitments

Global policies and commitments	
Global Strategy for Women's, Children's and Adolescents' Health (2016 - 2030) ¹³	<ul style="list-style-type: none"> • Provides a roadmap to achieve the right to the highest attainable standard of health for all women, children and adolescents in line with the commitments in the SDGs • Aims to transform the future and ensure that every newborn, mother and child not only survives, but thrives
Nurturing Care Framework ¹⁴	<ul style="list-style-type: none"> • Articulates the <i>Thrive</i> and <i>Transform</i> dimensions as they pertain to young children • Outlines the five dimensions of nurturing care, namely: good health, adequate nutrition, safety and security, responsive caregiving, and opportunities to learn • Identifies the key components of an environment that enables nurturing care focusing on families, communities, services and policy
G20 Initiative ^{18,19}	<ul style="list-style-type: none"> • Calls for increased investment, leadership, monitoring and accountability, and international co-operation and data sharing • Recommends that 1% of GDP be invested in ECD
National policies and commitments	
National Development Plan ²⁰	<ul style="list-style-type: none"> • Prioritises the provision of ECD services to vulnerable families as a key means for equalising opportunities and building human capital • Calls for improved access to quality early learning services (including introduction of two years of universal pre-school learning) • Recognises that benefits from pre-primary interventions will be constrained without support for ECD during the first 1 000 days
National Integrated Childhood Development Policy ²²	<ul style="list-style-type: none"> • Sets out clearly defined national commitment and allocation of associated departmental responsibilities • Assigns responsibility for provision of services for children 0 - 2 years to the DoH; these services include healthcare and nutrition programmes; prevention; early detection, intervention and rehabilitation; parenting support; opportunities for learning; and social welfare and protection services
State of the Nation address 2019 ²³	<ul style="list-style-type: none"> • President Cyril Ramaphosa announced the introduction of a second year of early childhood development for all children before they enter Grade 1, and the migration of responsibility for ECD centres from the Department of Social Development to the Department of Basic Education

ECD commitments in South Africa

The importance placed on early childhood is reflected in a number of key national plans and policies in South Africa.

National Development Plan

South Africa's National Development Plan (NDP) 2030 commits to allocating public resources to advance an inclusive development agenda.²⁰ It aims to reduce both poverty and inequality through development of the country's human capital, with a focus on equal opportunities, and the social and economic inclusion of historically marginalised people. The NDP identifies quality ECD as a fundamental building block in its vision. The provision of ECD services to vulnerable families is prioritised to improve possibilities for children trapped in inter-generational cycles of poverty and inequality so that they can develop to their full potential, and in so doing, drive inclusive and sustainable development of the country.

In prioritising ECD in national development, the NDP aligned itself with the Apex priorities articulated during the 2008 State of the Nation Address.²¹ However, the Apex priorities equated ECD with early learning services, leading to an emphasis on increased access to ECD centres to benefit children primarily three years and older, with the Department of Social Development taking the lead.

In contrast, the NDP adopts a wider, developmentally supportive understanding of ECD. It prioritises the provision of a comprehensive suite of ECD services, with particular emphasis on ECD services with the greatest potential to equalise opportunities. These include services in the first 1 000 days, notably maternal health and nutrition, infant health and nutrition, early development screening, family support, and support for early learning from birth. While the NDP recognises the value of improved access to and quality of early learning

services (and indeed calls for the introduction of two years of universal pre-school learning), it recognises that benefits from interventions aimed at supporting pre-primary learning (in ECD centres or other settings) will be constrained in the absence of support for ECD during the first 1 000 days. Although various government departments are accorded responsibilities for the early childhood period (0 - 2 years), the Department of Health is accorded a co-ordinating role.

Integrated ECD policy

The NDP's ECD vision has been translated into a clearly defined national commitment, and associated departmental responsibilities have been allocated through the National Integrated Early Childhood Development Policy.²²

The Policy acknowledges that it is the responsibility of Government to provide comprehensive ECD services to ensure that all children survive and develop to their full potential. It commits to providing a comprehensive age- and developmental stage-appropriate quality ECD programme for all young children and their caregivers by 2030. It commits to the universal provision of key services identified as most effective in equalising historical developmental disadvantages, with priority given to historically disadvantaged young children.²²

The Policy prioritises the provision of equalising and developmentally supportive ECD programmes that have "not been universally available and are not accessed by especially vulnerable children", especially in the first 1 000 days.²² These include food and nutritional support; parenting support; early care, early learning and development, especially for the youngest children, and for children living in poverty and in under-served areas; inclusive and specialised ECD services for children with disabilities; and information and education on ECD.

The ECD Policy places the primary responsibility for spearheading provision of services for young children (0 - 2 years) on the health sector. In terms of the Policy,

Box 1: Health sector actions and responsibilities as outlined in the Nurturing Care Framework

- Ensure that women and young children have access to good-quality health and nutrition services.
- Make health and nutrition services increasingly supportive of nurturing care.
- Increase outreach to families and children with the greatest risk of suboptimal outcomes.
- Establish specialised services for families and children with developmental difficulties and disabilities.
- Collaborate with other sectors to ensure a continuum of care.

Source: WHO, UNICEF, World Bank Group, 2018.¹⁴

the National Department of Health (NDoH) is responsible for “the provision of the health and nutrition programmes for pregnant women, infants and children; for parenting support programmes; and for increasing opportunities for learning and play for children from birth to two years, through health facilities and home visits by community health workers for children at risk of poor development outcomes”.²²

The responsibilities of the NDoH are spelt out in detail to include the duty to provide:²²

- Healthcare and nutrition programmes, notably free basic preventive, promotive and curative health care, and nutritional counselling, education, supplementation and support to secure the healthy mental and physical development of young children.
- Prevention and early detection, intervention and rehabilitation to ensure that children do not suffer from avoidable disabilities or developmental delays; to this end there must be routine maternal and young child screening at facility, community and home-based ante- and post-natal care visits.
- Parenting support to enable parents and caregivers to optimise the development of young children across all domains through the provision of education and information to improve parental knowledge; capacity and practices for development must include specialised support for children with developmental delays and disabilities.
- Opportunities for learning and play from birth to the age of two years through home visits by community health workers in the case of children at risk of poor development, and through routine visits to health facilities.
- Social welfare and protection services, including the provision of information; screening and referrals for birth registration; access to grants; and protection against family violence and/or child abuse, substance abuse, poverty and other developmental risk factors.

State of the Nation Address

In his 2019 State of the Nation Address, President Cyril Ramaphosa announced the introduction of a second year of ECD for all children before they enter Grade 1, and the migration of responsibility for ECD centres from the Department of Social Development to the Department of Basic Education.²³

While the focus on improving school readiness through better access to early learning programmes is to be welcomed, it must continue to be complemented by efforts to support caregivers, families and communities to promote early learning as part of nurturing care at household and community levels.

Child health services in South Africa

While the health sector provides a well-defined package of preventive and curative services that address the leading causes of child mortality,²⁴ it has not historically provided a number of the services envisaged in the ECD policy and/or Nurturing Care Framework at scale. In addition, ECD is still largely understood in the South African context to be about early child care and education delivered to children aged 3 - 5 through ECD centres. Responsibility for the care of young children (0 - 2 years) is largely assigned to families, with support from health services with regards to survival, growth and health, but not development or learning.¹⁰ Health sector policy makers and implementers within the health sector, who have historically focused on provision of routine health services, are challenged to review their approaches and roles in light of these broader goals.

The NDoH has begun the process of re-engineering child health service provision, with support from partners with experience in ECD, child health and communication. While currently focused primarily on behaviour change communication, the new Road to Health Booklet (RtHB) and Side-by-Side initiative also provide a structure for mobilising health workers (especially community health workers) to promote and support a more comprehensive approach to child health and well-being.

The new Road to Health booklet

The RtHB is a widely accepted and used tool to improve child health and nutrition. More than one million RtHBs enter households each year, and more than 98% of caregivers of young children report having received a booklet or similar record.²⁵ Although previous versions of the RtHB have included health-promotion messages and information on child development, the booklet has primarily been used as an immunisation record, with little attention being paid to other aspects of child growth and development.

The new RtHB positions itself as a key resource for caregivers and healthcare workers. It is designed around five pillars that are conceptualised and presented as the five things that children need to grow, to be healthy, and to reach their full developmental potential (Box 2). These themes are aligned with the five components of the Nurturing Care Framework; however, as the RtHB is an individual health record, more emphasis is placed on individual than on population or environmental factors. Each pillar contains information and key messages aimed at ensuring that young children have access to the full range of nurturing care services at both health facilities and in their homes. The RtHB also serves as a more detailed tool and guide for health workers on the goals of their work and how to structure their interactions with young children and their caregivers.

Side-by-Side Campaign

The Side-by-Side Campaign aims to ensure that the messages in the RtHB reach caregivers of young children and provide them with information and support to improve nurturing care. The central message of the campaign is: “You are central to your child’s nurturing, care and protection – and their lifelong health outcomes. Your health worker is there to support you.”

The name “Side-by-Side” describes the supportive relationship between a child and his or her caregiver, as well as the relationship between healthcare workers and other practitioners who support and advise caregivers. Side-by-Side aims to convey the concept of partnership and togetherness, and speaks to the shared child-rearing journey that caregivers embark on with their children and all those who help and support them.

The key components of the Side-by-Side Campaign are shown in Table 2. It should be noted that to date more emphasis has been placed on communication interventions than on all other components.

What still needs to be done?

Over the next three to five years, the new RtHB and Side-by-Side Campaign will provide a platform to improve nurturing care, and to expand and strengthen the package of services provided to young children and their families through the health system. However, for this to be realised, a number of issues will need to be addressed.

Shifting the paradigm: leadership and partnership

Despite the ECD Policy, ECD still tends to be understood as being about preschool and centre-based care, with less attention being paid to learning. At the same time, the child health agenda is still primarily led by the need to reduce

mortality, and it continues to focus on provision of vertical child survival interventions, with less attention paid to other mandates contained in the ECD policy. While this is to some extent related to the constrained fiscus that limits capacity to introduce additional services, it also reflects a failure to shift the service delivery paradigm from ‘survive’ to ‘survive and thrive’.

Progress made with the RtHB redesign and the Side-by-side Campaign have been successful through co-ordinated partnerships between the DoH, civil society, academia and implementation partners.²⁶ Further advancements in building a foundational system of support for health workers, parents/caregivers, civil society and the private sector to promote nurturing care, will require development of a shared vision, strategic leadership and visible commitments, including financial, across the health and other sectors.

Defining and providing a first 1 000-day service package

As previously noted, coverage has improved significantly for many key maternal and child survival interventions although further improvements are still required to ensure that all mothers and children receive the services. However, more attention needs to be paid to providing services that support caregivers who provide nurturing care, and it will be important to ensure that these form part of national health insurance service benefit packages.

Such services include provision of screening and mental health support for pregnant women and mothers; parenting support to promote nurturing care; strengthened childhood development screening and support services; and targeted and/or specialised support and care for young children at risk of poor development, or with developmental difficulties, disabilities and/or long-term health conditions, as well as support for their families.

Strengthening child development services is an important priority. Currently, child development is seldom assessed

Box 2: Five themes in South Africa's new Road to Health Booklet, 2018



Nutrition Good nutrition is important for you and your child to grow and be healthy. It starts with breastfeeding.



Love Your child learns by looking at you, and from being held close to you; it is important to love, play and talk with your child.



Protection Your child can be protected from disease and injury by being immunised and by playing in safe places.



Healthcare Your child needs help from you or a health worker when sick or injured.



Extra care Your child may need special care or support, and knowing what to do and where to go will help both of you.

at routine child health consultations or when children are hospitalised. Where child development screening occurs at PHC level, quality is variable and the response to detection of developmental concerns and referral is not consistent.

Where children are identified as having developmental difficulties or disabilities, responsive, high-quality, individualised and family-centred assessment and care are required, offered by trained health workers within and beyond health facilities. Rehabilitation services are thinly spread, with shortages of appropriately skilled staff and resources to conduct assessments and provide follow-up care.^{27,28}

Provision of the full package of services, as outlined in the ECD policy, will also require improved linkages and collaboration between different sectors. Social welfare and protection remain the responsibility of the Department of Social Development, although the health system has an important role to play in improving access to these services through early identification and referral of at-risk children and families. The most challenging services to provide are those that require collaboration from different sectors at an operational level, and more work needs to be done to better define the respective roles of different sectors and how these sectors should work together in providing an integrated service. For example, the health sector is well-placed to provide general information and support aimed at improving parenting skills; however, intervening to protect children from abusive parents remains the responsibility of social development services. Roles and responsibilities need to be defined both broadly, and at local levels, in order to ensure that the needs of vulnerable children and their families are met.

Reorganisation of health services

Moving from a 'survive' to 'survive and thrive' paradigm within the health sector, demands a significant shift in how services are organised and delivered. Ideally, mother and child services should be provided together rather than as separate services to facilitate more integrated consultations that include a focus on psycho-social aspects of care. The 'three-stream' concept introduced by the Ideal Clinic initiative provides an opportunity for this. Nevertheless, health facilities will have to be reorganised significantly to achieve this.

Strengthening the role of community health workers

Over the past two decades there has been an increasing focus on providing a continuum of care, from homes and communities to clinics and hospitals. Community healthcare workers already provide a range of services to mothers and children and are extremely well placed to expand these services to provide the full-range of ECD services, as outlined in the Nurturing Care Framework and ECD Policy. As noted above, the community health worker scope of work has been aligned with the RtHB pillars. However, community health workers will only be able to fulfil this role if maternal and child health are seen to be a core focus of their work, and appropriate support systems are put in place.

Reorientation of other health workers

Shifting from an emphasis on 'survive' to 'survive and thrive' will also require a shift in the way health workers interact with children and their parents during well- and sick-child consultations, with more emphasis on empowering mothers and other caregivers to provide the full range of nurturing care. It is imperative that parents/caregivers are recognised

Table 2: Components of the Side-by-Side Campaign, South Africa, 2019

Component	Intervention	Current progress and activities
Demand-side interventions	Mass communication	<ul style="list-style-type: none"> Radio drama and question-and-answer sessions broadcast on 11 SABC radio stations in 10 official languages. These shows reach an estimated 4.2 million listeners per week Booklets with the RtHB messages are available in all official languages Caregivers can download an electronic version of the RtHB (which also delivers postnatal MomConnect messages) Side-by-Side Facebook page and website
Supply-side interventions	Providing comprehensive ECD services at PHC facilities	<ul style="list-style-type: none"> RtHB support materials for healthcare workers are being developed An integrated mother-baby package of health care for the first 1 000 days will be defined Defining childhood development services in PHC facilities, as well as referral networks and co-ordination mechanisms
	Ensuring that community health workers play a key role in providing comprehensive ECD services	<ul style="list-style-type: none"> The scope of work for community health workers has been aligned with the five RtHB pillars

ECD = early childhood development; PHC = primary health care; RtHB = road to health booklet.

by health workers as key partners in this endeavour and that sufficient time is spent on health, nutrition and development counselling, collective problem solving and shared decision making around the care of their children.

Ongoing efforts and resource commitments are required to support health workers to promote comprehensive, integrated and nurturing care in all their interactions with children and their families. This requires better linkages with and influence on the curriculum and education of all health workers involved in the care of children. This learning must be reinforced with ongoing supervision and mentorship, through continuing professional development and the availability of appropriate support tools and materials.

Monitoring and evaluation

Public health efforts around child health remain primarily focused on mortality (and morbidity) reduction, and thus priority child health indicators are still linked to this agenda. In addition, current indicators of childhood development used in routine monitoring systems or national survey instruments are largely inappropriate to measure implementation and progress toward improving nurturing care through the health system. New indicators and audit instruments need to be developed. Routine monitoring and audits will ensure that newer additions to the child health package (delivered as envisaged through the RtHB) are implemented consistently.

Conclusions

Progress has been made in reducing mortality and in ensuring that South African children have access to key child survival interventions. Nevertheless, most South African children continue to face adversity, and many are at risk of poor health and human capital outcomes in childhood, adolescence and adulthood. This has significant immediate and long-term impacts on our society at an individual and population level.

As child mortality reduces, and consistent with the 'survive, thrive, transform' agenda, the health sector has both the obligation and the opportunity to develop and implement a more comprehensive understanding of and approach to child well-being.

Some progress has been made, as noted in the shift in communication, with more information being provided to caregivers regarding all aspects of the Nurturing Care Framework through the new RtHB and the Side-by-Side Campaign. Ensuring that the package of services provided during the first 1 000 days is more comprehensive and includes the services envisaged in the Nurturing Care Framework and the ECD Policy will require substantial changes in how services are organised, delivered and monitored. However, without this paradigm shift it will be

difficult to break the repeated cycles of adversity, and improve the health, nutrition and well-being of most of South Africa's children.

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Achieving universal health coverage for adolescents in South Africa:

health sector progress and imperatives

Authors

Kim Jonas^{i,ii}
Trisha Ramrajⁱ
Ameena Goga^{i,iii,iv}
Arvin Bhana^{iv}
Catherine Mathews^{i,ii}

Investment in adolescent health and wellbeing today will bring multiple benefits, leading to better long-term health for this generation and generations to come.

Investing in adolescent health and wellbeing is critical as 35% of the global burden of disease has its roots in adolescence. However, despite the increasing global focus on adolescent health and wellbeing, there has been little progress in attaining universal health coverage for adolescents.

South Africa is known for its robust policies and initiatives, stemming from the human right's perspective reflected in the country's Constitution. This includes initiatives to

promote access to high-quality health care for adolescents, who comprise 18.5% of the population. This chapter reviews progress towards achieving UHC for adolescents within the South African public health sector. It goes on to summarise the health risks faced by adolescents, and to review policies and initiatives to deliver adolescent-responsive, quality health services and create demand for health care among adolescents in the country.

i Health Systems Research Unit, South African Medical Research Council
ii Adolescent Health Research Unit, Department of Psychiatry and Mental Health, University of Cape Town
iii Department of Paediatrics and Child Health, University of Pretoria
iv HIV Prevention Research Unit, South African Medical Research Council
v Centre for Rural Health, School of Nursing and Public Health, University of KwaZulu-Natal

Introduction

Adolescents represent the largest and fastest-growing population group worldwide.¹⁻³ Globally, adolescents aged 10 - 19 years comprise 16% of the total population (1.2 billion people).¹ In sub-Saharan Africa, adolescents aged 10 - 19 years constitute the largest proportion (23%) of the total population.¹ In South Africa, the population curve demonstrates an adolescent and youth bulge (Figure 1), with adolescents comprising 18.5% of the total population. Investment in adolescent health and wellbeing today will bring multiple benefits, leading to better long-term health for this generation and generations to come.⁴

It is estimated that the adolescent population will continue to increase through to 2050, highlighting the need to strengthen efforts to make this population group a healthy one.⁶ It is therefore not surprising that adolescents are central to the Sustainable Development Goals (SDG) 2030 agenda as 12 indicators relate specifically to them.⁷ The SDGs aim to transform the world through improving health and wellbeing for all individuals, including adolescents. Specifically, target 3.8 of the SDGs seeks to “achieve universal health coverage (UHC), including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all”.⁷ UHC is defined as “access to good quality promotive, preventive, curative, rehabilitative, and palliative health services for all people, without financial hardship”.⁸ Like the Millennium Development Goals (MDG)⁹ agenda, SDGs present an opportunity for global and national commitment towards

achieving UHC for all, especially adolescents as they have the potential to bring global sustainable transformation if they have better health and wellbeing.

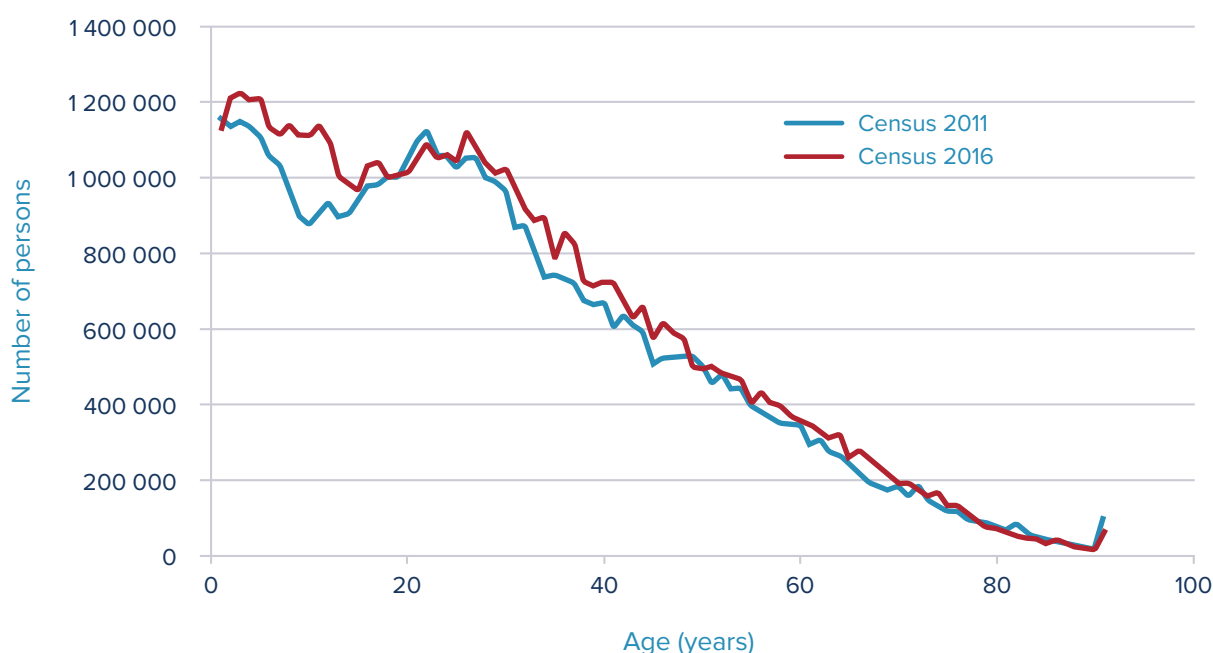
Achieving UHC entails three basic policy principles: ensuring that service delivery, laws and policies are improved; ensuring that efficient and equitable financing is implemented; and strengthening governance through meaningful participation.^{6,8} These principles are applicable to achieving UHC for adolescents, but special attention must be paid to the specific needs of this group.

This chapter reviews progress towards achieving UHC for adolescents within the South African public health sector. It goes on to summarise the health risks faced by adolescents, and to review policies and initiatives to deliver adolescent-responsive, quality health services and create demand for health care among adolescents in the country.

Determinants of health for adolescents

Adolescents go through key developmental changes and experiences as they transition from childhood to adulthood.^{2,10} For this reason, adolescents exhibit unique characteristics that distinguish them from other population groups, hence their health needs are unique and require special attention. The specific and interrelated individual, interpersonal, community and organisational/structural factors affecting adolescent health and access to health services and interventions are described below (Figure 2).

Figure 1: South African population between 2011 and 2016, showing adolescent and youth bulge



Source: Statistics SA, 2016.⁵

Individual factors

Neurological development, such as development of the limbic system of the brain (inter alia responsible for pleasure seeking) precedes development of the pre-frontal cortex responsible for decision-making processes and impulse control.¹⁰ During adolescence, neurological development affects exploration and experimentation, often leading to healthy and unhealthy behaviours.¹⁰ This predisposes adolescents to risk taking.^{10,12} For example, tobacco and alcohol use and use of other substances often begin during adolescence, and can have a detrimental effect on adolescent and adult health.² Alcohol use is associated with unintentional and intentional non-adherence to the antiretroviral therapy (ART) regimen.¹³⁻¹⁵ Alcohol and substance use impact people's decision-making and increase the likelihood of unprotected sex, and the likelihood of sexually transmitted infections (STIs) and HIV incidence.¹³

Interpersonal factors

Psychosocial immaturity affects the physical capacities of adolescents, their sensation seeking, and their capacity for self-control compared with adults.¹² On the one hand, adolescents seek independence, while on the other they depend on their families for transportation, company, and sometimes permission to access healthcare services.¹⁰⁻¹² This often results in adolescents being unable to obtain the necessary health information and services they need for their health. Limited access to sexual and reproductive health (SRH) information and services among adolescents is a major contributing factor to early unintended and unwanted pregnancies.

Community-level factors

Community norms and values reflect adult views, which may not support adolescent sexuality. Consequently, many

adolescent-related health behaviours such as contraception-seeking, are stigmatised within communities, deterring adolescents from seeking the services.¹⁰⁻¹² Access to contraceptives among adolescent girls is a growing public health concern as teenage pregnancy rates are declining at a slower rate among adolescents in South Africa than among their peers in developed countries, despite the availability of contraceptives at no cost from the public health services.^{3,16,17} According to the United Nations Population Fund (UNFPA), teenage pregnancy changes a girl's life significantly as her health and that of the baby are compromised, as well as her educational and future employment prospects.¹⁸ Furthermore, teenage pregnancy is a risk for maternal and child morbidity and mortality.

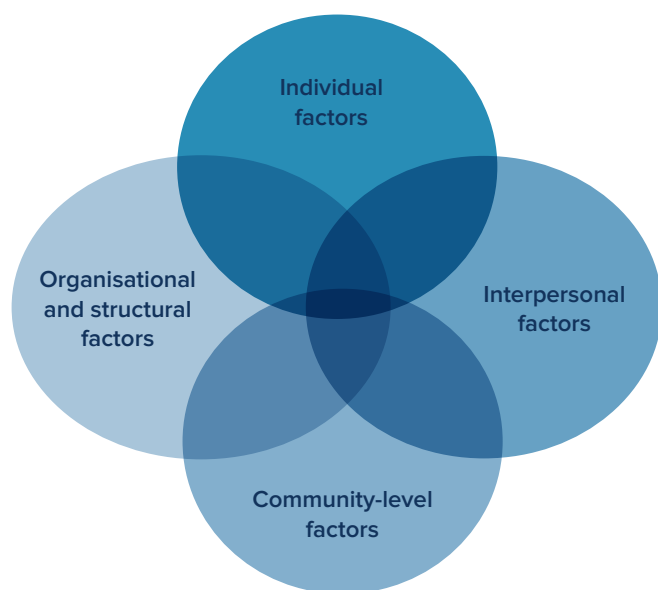
Organisational and structural factors

Health services need to respond to the unique and evolving health needs of adolescents by providing respectful, patient-centred, high-quality, well-coordinated, appropriate care with accurate provision of information, as stipulated in the World Health Organization (WHO) adolescent-friendly standards.¹⁹ However, given that adolescence is a transitional period between childhood and adulthood, the place of adolescents in the health system is often not well-defined, posing a challenge to the provision of adolescent-friendly services.

Education, poverty and violence

South Africa has one of the highest observed proportions of adolescents not in employment, education or training (NEET).^{17,20} In the case of adolescent girls in particular, higher levels of educational attainment are associated with lower risks of HIV and other STIs.²¹ In addition to level of education, frequency of school attendance/absenteeism is also associated with HIV and other STIs.²¹ School dropout is associated with pregnancy among adolescent girls as

Figure 2: Ecological model of factors that make adolescents unique



Source: Adapted from Baltag V, Sawyer SM; 2016.¹¹

both a cause and consequence of dropout.²² Economic interventions have the potential to reduce the risk of HIV and intimate partner violence (IPV) among adolescents.^{23,24} There is a large body of evidence showing that IPV and sexual violence increase the susceptibility of adolescent girls to HIV and undermine HIV treatment.^{25,26}

The above factors and determinants of health need to be considered when designing and delivering services that respond to the needs of adolescents in order to increase service coverage and uptake. Currently, health service delivery in South Africa does not specify the adolescent space, except for a few primary health care (PHC) facilities that have youth clinics on certain days and/or times during weekdays.

Burden of disease among adolescents

Until recently, adolescents and young people have not been prioritised in global health and social policy,⁴ hence they have experienced fewer benefits than adults from the epidemiological transition whereby reduced mortality and fertility have shifted population structures and patterns of disease.^{2,4,17} Globally, an estimated 1.3 million deaths occurred among 10 - 19-year-olds in 2012,^{27,28} with the top five leading causes of death among adolescents and young people being injuries, AIDS-related causes, suicide, lower respiratory tract infections, and interpersonal violence.^{2,4,29} Of critical concern is the estimated number of global HIV-related deaths among adolescents aged 10 - 19, which has nearly tripled from 21 000 in 2000 to 60 000 in 2014, while a decrease has been observed in all other age groups.²⁸⁻³⁰ In 2015, adolescent HIV-related mortality increased, which is alarmingly inconsistent with the decreasing trend measured in older populations,²⁷⁻³⁰ and in 2016, the leading causes of death among adolescent girls aged 10 - 14 and 15 - 19 years were HIV/AIDS and maternal conditions, respectively.^{2,30}

Furthermore, more than half of all adolescents grow up in multi-burden disease countries characterised by high levels of poverty and multiple colliding epidemics, including high prevalence of diseases of poverty such as HIV and AIDS, tuberculosis (TB), high maternal mortality ratio and infant mortality rates, and high incidence of non-communicable diseases (NCDs).⁴ These colliding health problems, set against a backdrop of poverty and lack of adolescent-responsive health services, have implications for adolescent health and wellbeing and continue to exert significant impact as young people grow into adulthood.⁴

Although adolescence is often considered a healthy stage, 35% of the global burden of disease originates during adolescence. For example, tobacco and alcohol use often begin during adolescence and they are major risk factors for NCDs during adulthood.² Mental health conditions account

for 16% of the global burden of disease and injury among 10 - 19-year-old adolescents, and an estimated 10 - 20% of adolescents experience mental health conditions, which are largely underdiagnosed and undertreated.²⁷ Alcohol use is now linked to various NCDs, including eight different types of cancer, hypertension, fetal alcohol syndrome when consumed during pregnancy, and various forms of liver and other organ diseases such as pancreatitis in adulthood.⁴

Burden of disease among South African adolescents

In 2015, the top risk factors for morbidity and mortality among South African adolescents were HIV, teenage pregnancy, substance use, and violence and injury; these, together with TB were among the top 10 causes of mortality in this population.^{29,30} Although there has been a modest decline in mortality rates among adolescents aged 10 - 19 years in South Africa, decreasing from 131 in 2001 to 111 in 2011, deaths among adolescents accounted for an estimated 2.5% of the total number of household deaths reported in 2016.^{29,30}

HIV prevalence among adolescents remains a challenge in South Africa, particularly among adolescent girls, as recent estimates show a 5.8% prevalence rate compared with 4.7% for adolescent boys.³¹ With regard to viral load suppression, less than 50% of HIV-positive adolescents and young people aged 15 - 24 years are virally suppressed, presenting a serious challenge to improving health and wellbeing of adolescents living with HIV.³¹ Despite numerous efforts to help alleviate the burden of HIV among adolescent girls and young women they continue to be disproportionately affected by HIV.

Little information exists about the prevalence of mental health disorders among adolescents in South Africa, but an expert consensus systematic review determined an overall prevalence rate of 17% among children and adolescents in the Western Cape.³² Early trauma and violence in childhood have been shown to affect the mental health of adolescents.³³

Initiatives towards UHC for adolescents in South Africa

In addition to being central in the SDGs, adolescents are also prioritised in the Global Strategy for Women's, Children's, and Adolescent's Health (GS 2016 - 2030).³⁴ Among other things, this Strategy aims to end all preventable maternal and new-born deaths, and to ensure that every child not only survives but thrives and transforms over the life course through enabling environments that support their health and wellbeing.³⁴ To achieve these objectives and those of the SDGs, countries have had to develop strategies and initiatives promoting health equity and coverage.

South Africa is well known for its progressive human-rights-based policies guided by the Constitution and is committed to global efforts towards achieving UHC through its National Health Insurance (NHI) Policy, which has been proposed as the overarching policy for achieving UHC. The NHI Policy is a health-financing system designed to pool funds to provide access to quality affordable personal health services for all South Africans, including adolescents, based on health needs and without financial hardship to any family or family member.³⁵

As part of NHI reform, and the revitalisation of PHC policies geared towards achieving UHC in South Africa, PHC has been re-engineered into three streams, one of which involves strengthening school health services for adolescents through the 2012 Integrated School Health Programme (ISHP).^{36,37} The ISHP aims to provide a comprehensive package of health services for children and adolescents that address barriers to learning and conditions contributing to morbidity and mortality.³⁶ It focuses strongly on involvement of key stakeholders such as educators and health service providers, and offers a range of health services such as SRH services, screening for health (vision, oral screening, and TB), and vaccination.³⁶

The UNAIDS 90-90-90 targets aim to achieve the following: 90% of all HIV-positive persons know their status; 90% of those diagnosed access ART; and 90% of those on treatment achieve viral suppression.^{28,38} Ending HIV and AIDS is prioritised in SDG goal 3.3, which aims to end AIDS, TB and other communicable diseases by 2030.^{7,38} The South African National Strategic Plan for HIV, TB and STIs 2017 - 2022 (NSP 2017 - 2022)³⁹ is South Africa's initiative towards ending AIDS by 2030 and its targets are aligned with the 90-90-90 global targets and the All-In Strategic Framework.⁴⁰ Preventing HIV infection among adolescent girls and young women is a key focus in the NSP³⁹ as preventing horizontal as well as vertical transmission of HIV are important in ending the epidemic.

The All-In Strategic Framework, a global initiative for ending HIV and AIDS among adolescents by 2030, has three targets for the year 2020: at least 75% reduction in new HIV infections among adolescents; at least 65% reduction in AIDS-related deaths among adolescents; and an end to HIV and AIDS stigma and discrimination.⁴⁰ In line with UHC objectives, the Framework seeks to drive a fast-track effort through partnerships that combine forces to improve leadership, commitment, investments and programmes, and that strengthen data, implementation and systems for adolescent engagement across a wide range of areas.^{39,40}

The WHO standards on adolescent-friendly health services are global standards to ensure adolescent-responsive healthcare services.¹⁹ In South Africa, an early initiative to promote adolescent-friendly health services was the National Adolescent Friendly Clinic Initiative (NAFCI), implemented between 1999 and 2006 by LoveLife, a national youth HIV-prevention initiative in partnership with the National Department of Health (NDoH).^{41,42} The current

South African Adolescent and Youth Friendly Services (AYFS) initiative is a government initiative comprising an accreditation model to drive adolescent- and youth-responsive health care and quality improvements in clinics.⁴³ The AYFS is aligned with the Adolescent and Youth Health Policy and is a standard-driven approach to improve adolescent and youth access to high-quality health care for adolescents and youth. It is well-aligned with WHO global standards for quality healthcare services for adolescents.⁴³

Another initiative to expand high-quality healthcare services to adolescents is the Adolescent Sexual and Reproductive Health and Rights (ASRHR) Framework.⁴⁴ ASRHR focuses on increasing coordination, collaboration, information and knowledge-sharing among key stakeholders responsible for developing innovative approaches to comprehensive SRHR information, education and counselling for adolescents, and on strengthening ASRHR service delivery.⁴⁴ The ASRHR Framework is a step towards achieving universal SRH service delivery for adolescents, but on its own it is insufficient to achieve UHC for adolescents as it has implementation challenges at facility level.

The Child and Adolescent Mental Health (CAMH) policy⁴⁵ is a guiding framework for establishing mental health services for children and adolescents in South Africa using an intersectoral approach that is collaborative and integrative within the health sector, and that includes families of the children and adolescents.⁴⁵ The CAMH is a stand-alone policy as there is no specific provision for children and adolescents in the national mental health policy guidelines.⁴⁶

Thus far the chapter has focused predominantly on policies and initiatives that aim to ensure a supply of high-quality healthcare service delivery for adolescents. In addition to service delivery, there is a need for interventions to increase adolescent demand for health care. The latter is influenced by the quality of available services, and also by adolescents' motivation to use the services, their knowledge of where and when to go, their ability to get to the services, community support for the services, and support for adolescents' use of the service. MomConnect,⁴⁷ a mobile technology intervention, is an example of a digital intervention to increase the demand for maternal and child health services.⁴⁷ Implemented at large scale, with broad intervention reach, mobile technology can potentially improve access and use of health services, thereby improving service coverage. B-Wise⁴⁸ and She Conquers⁴⁹ are similar demand-creation interventions specifically targeted at adolescents and youth, with great potential to expand service coverage.

UHC for adolescents in South Africa: progress and challenges

Despite an enabling policy environment for adolescents in South Africa as described above, there have been

numerous foundational challenges across the health system ‘building blocks’,⁵⁰ including challenges with governance, medicines and technologies, human resources, service delivery, lack of adolescent-specific indicators in the data information system, and system financing. These elements are key in achieving UHC, and without strengthening them and ensuring that interventions to improve adolescent health are prioritised across the health system, achieving UHC for adolescents will remain a challenge in South Africa.

To ensure targeted action and progress in achieving adolescent health, the Lancet Commission has proposed 12 headline indicators encompassing health needs, health risks and the social determinants of health (Table 1, columns 1 and 2).¹⁷ In columns 3 and 4 of Table 1, potential data sources are described for South African adolescents, and the most recent estimates for the headline indicator are included, where available. These estimates can be regarded as indicators of past progress towards achieving UHC for adolescents, as well as indicators of the unfinished agenda. For example, South Africa has a high proportion of adolescents not in employment, education or training (NEET), which is a social determinant of adolescent health. South Africa’s efforts to achieve UHC for adolescents will be dependent upon progress in reducing the prevalence of adolescents who are NEET (Table 1).

Across the public sector, health system weaknesses have undermined clinical competence, and quality of care and safety for citizens, including adolescents.^{51,52} The public health workforce is under strain, with insufficient stewardship of human resources for health planning across the system, and staff shortages especially in rural and underserved areas.⁵² There are stockouts of essential medicines such as ARVs, TB medication and contraceptives.⁵³ Underlying these weaknesses are leadership, management and governance failures. Governance is a key foundational health system building block and refers to the oversight and guidance that enables the entire system to function effectively.⁵² Without strengthening health systems and public health policy by addressing these factors, UHC may be unattainable, more so for adolescents and other vulnerable groups in this country.

Implementation of the ISHP has focused primarily on primary schools, where health assessments and appropriate vaccines are administered. The programme now includes the human papillomavirus (HPV) vaccination, which is one of the key successes of the ISHP.³⁷ However, the ISHP as originally conceptualised has not been fully implemented. For example, SRH services have not been made widely available in high schools, and most schools only offer limited SRH education. Provision of the full package of services is dependent on school governing body approval.³⁷ The high unmet demand for contraception among adolescents has been ascribed to a failure of the ISHP, among other factors.³⁷

Despite NSP 2017 - 2022, South Africa has made inadequate progress towards achieving 90-90-90 targets among adolescents. It is well established that adolescents

diagnosed with HIV have poorer adherence to ART than the older population groups,^{54,55} and are the only age group with increasing HIV mortality.²⁷⁻²⁹ Compared with adult mothers, adolescent mothers living with HIV are more likely to have unplanned pregnancies and less likely to access interventions to prevent mother-to-child transmission.^{54,55}

To date there is no evidence that clinics implementing Adolescent and Youth-Friendly Services (AYFS) provide more adolescent-responsive, high-quality care than those not yet implementing it.^{41,42} Given their dissatisfaction, adolescents and young people say that they would not recommend the clinics they attended to their peers.⁴¹ An evaluation of AYFS health facilities conducted in 2015 in 14 health facilities in a sub-district in Gauteng and 16 health facilities in a sub-district in North West, found that none of the service providers met the minimum standards of AYFS.⁴²

Despite the AYFS initiative and the Adolescent Sexual and Reproductive Health and Rights (ASRHR) policy, adolescents have a high unmet need for contraception and a high prevalence of unintended pregnancy.^{37,56} Little is known about adolescents’ access to abortion in the country. Maximising efforts to improve access to SRH services for adolescents holds the potential to reduce unintended pregnancy and unsafe abortions, while concurrently improving reproductive health and safer conception options for those living with HIV.

The technical and attitudinal competency of health workers is central to the implementation of AYFS standards, as stipulated in the WHO Core Competencies in Adolescent Health and Development for Primary Care Providers.⁵⁷ Building an adolescent-competent health workforce will require in-service training for health workers, an improved pre-service curriculum, and continuing professional education. An adolescent-competent, supportive healthcare provider needs knowledge, skills (including communication skills), and an attitude that is understanding and responsive to adolescents’ developmental and health needs according to their age and stage of development.^{11,19} Such healthcare providers also need to be competent in applying laws and policies that promote, protect and fulfil adolescents’ healthcare rights, including assessment of adolescents’ capacity for autonomous decision-making.^{11,58} Healthcare providers are often unprepared to respond to adolescent health needs, including SRH, because of insufficient training and unsupportive community norms.^{2,58,59}

Although relatively old, the CAMH policy has not yielded results as very few resources and funding have been dedicated to it at both provincial and national level.^{46,60} Mental health services for adolescents have not been prioritised despite the inclusion of mental health services in the ISHP policy. Early identification of adolescents with mental health problems is likely to be most efficient at school level, with systems to ensure referral by schools to mid-level counselling psychologists at district level, and an upward referral system for more severe cases. At community

Table 1: South African estimates for 12 headline indicators of adolescent health

Headline indicator short title	Headline indicator definition	Source and definition of South African indicators	Most recent estimate for South African adolescents
Health outcome			
Group DALYs	DALYs per 100 000 adolescents due to communicable, maternal and nutritional diseases in individuals aged 10 - 24 years	No available reliable source at present	Not available
Injury DALYs	DALYs per 100 000 adolescents due to injury and violence in individuals aged 10 - 24 years	No available reliable source at present	Not available
NCD DALYs	DALYs per 100 000 adolescents due to NCDs in individuals aged 10 - 24 years	No available reliable source at present	Not available
Health risks			
Daily tobacco	Daily smoking of any tobacco product in individuals aged 10 - 24 years	Source: SADHS ³ Definition: Daily and occasional smoking of any type of tobacco by people aged 15 - 24 years	2016 findings: Females: 15 - 24 years, daily or occasional smoker: 4.9% Males: 15 - 24 years, daily or occasional smoker: 28.9%
Binge drinking	Binge drinking in past 12 months in individuals aged 10 - 24 years (>48 g of alcohol for females, >60 g for males)	Source: SADHS ³ Definition: Drinking five or more standard measures of alcohol on a single occasion in the 30 days prior to the survey	2016 findings: Females: 15 - 24 years, binge drinking past 30 days: 5.1% Males: 15 - 24 years, binge drinking past 30 days: 20.7%
Overweight and obesity	Individuals aged 10 - 24 years who exceed WHO guidelines for overweight (IOTF thresholds, age-specific and sex-specific thresholds equivalent to a BMI ≥ 25 kg/m ² at age 18 years)	Source: SADHS ³ Definition: BMI ≥ 25.0 kg/m ²	2016 findings: Females: 15 - 24 years, 39.8% ≥ 25.0 kg/m ² Males: 15 - 24 years, 11.2% ≥ 25.0 kg/m ²
Anaemia	Prevalence of iron-deficiency anaemia in individuals aged 10 - 24 years (for those aged 10 - 14 years haemoglobin <115 g/l; for those aged 15 - 24 years, <130 g/l for males, <120 g/l for non-pregnant females, and <110 g/l for pregnant females)	Source: SADHS ³ Definition: Any anaemia for non-pregnant women <12.0 g/dl, for pregnant women <11.0 g/dl, and for men <13.0g/dl	2016 findings: Females: 15 - 24 years of age, 33% had any anaemia Males: 15 - 24 years of age, 13.3% had any anaemia
Social determinants of health			
Secondary education	Completing ≥ 12 years of education among individuals 20 - 24 years	Source: SADHS ³ Definition: Among 20 - 24-year-olds, completion of secondary school	2016 findings: Females: 39.7% Males: 34.0%
NEET	Individuals aged 20 - 24 years not NEET	Source: South African Child Gauge ³³ Definition: Among 15 - 24-year-olds, proportion not attending any educational institution and who are not employed or self-employed	2017 findings: 34.3 %

Table 1 (cont.)

Adolescent livebirths	Birth rate (livebirths per 1 000 population per year) in females aged 10 - 19 years	Source: SADHS ³ Definition: Adolescent birth rates per 1 000 women	2016 findings: Females: 10 - 14 years: 1 per 1 000 Females: 15 - 19 years: 71 per 1 000
Child marriage	Proportion of females aged 20 - 24 years in marriage or union before age 18	Source: SADHS ³ Definition: Among males and females aged 20 - 24 years, proportion who had been married or living together with a partner as if married before age 15 and 18 years	2016 findings: Females currently aged 20 - 24: 0.9% were in a union by age 15, 3.6% by age 18 Males currently aged 20 - 24, 0.4% were in a union by age 15, 0.6% by age 18
Demand for modern contraception satisfied	Proportion of females aged 15 - 24 years whose demand for contraception is satisfied with a modern method	Source: SADHS ³ Definition: Unmet need for contraception. Proportion of women who: (1) are not pregnant and not postpartum amenorrhoeic and are considered fecund and want to postpone their next birth for two or more years or stop childbearing altogether but are not using a contraceptive method; or (2) have a mis-timed or unwanted current pregnancy; or (3) are postpartum amenorrhoeic and their most recent birth in the last two years was mis-timed or unwanted.	2016 findings: Unmet need among sexually active women 15 - 19 years: 31%; among sexually active women 20 - 24: 28%

Source: Azzopardi et al. 2019.¹⁷

DALY = disability adjusted life year; IOTF = International Obesity Task Force; NCDs = non-communicable diseases; NEET = not in employment, education or training; SADHS = South Africa Demographic and Health Survey.

level, there is a need to reconsider the scope of practice of ward-based outreach teams related to identifying children and adolescents with mental health problems for appropriate assessment and referral.

availability of friendly, supportive staff and convenient opening and closing hours of facilities – this is a specific requirement to improve coverage and uptake of adolescent-friendly health services; developing adolescent-specific indicators in the data management system; and financing mechanisms that specifically ring fence funding to improve adolescent health.

Conclusion

Despite the availability of progressive adolescent-related policies and initiatives in South Africa, implementation challenges exist and are impeding progress towards the achievement of UHC. As demonstrated, the source of these challenges lies in weaknesses in the public health system across the six system building blocks. Achieving UHC and optimal health for adolescents will require multi-sectoral collaboration to increase NEET among adolescents, and to implement specific health-related interventions. The latter include both general and adolescent-specific interventions that focus on improving: governance and leadership within the health system – this is a general requirement across the health system that would improve overall governance; the availability of medicines and technologies needed by all users, including adolescents; the

Recommendations

In order to achieve the ‘triple dividend’ envisaged by the Lancet Commission on Adolescent Health and Wellbeing, the South African public health system needs to be strengthened to meet the unique needs of adolescent clients. In addition to overall health system strengthening, implementation of South Africa’s adolescent-specific policies and programmes needs to be monitored using adolescent-specific indicators or age-disaggregated indicators, and systems should be strengthened routinely based on these data. This entails capacity development of healthcare personnel to use data and provide people-centred, adolescent-friendly services. There is a need to define

and monitor indicators for effective UHC coverage among adolescents, and to monitor the quality of adolescent health services routinely. Such indicators and reviews should be aligned with global initiatives and integrated within routine health system functioning to ensure sustainability. Efforts to increase human resources for health and training of healthcare providers to be adolescent-competent are urgently required to achieve UHC for adolescents.

At PHC level, measures for screening and early identification of risk factors among adolescents are necessary to avert long-term health consequences in adulthood; this would be a step towards preventing and promoting healthy behaviours early on. With screening and assessment in place comes the urgent need to strengthen referral systems for linkage to care and other services for adolescents. There is an urgent need to scale up interventions to prevent early unintended pregnancy, as promoting contraceptive access and use among adolescents is likely to reduce morbidity and mortality among adolescents and young people in South Africa. Additionally, once pregnancy has occurred there is an urgent need to keep pregnant learners in school before and after delivery. An intersectoral approach between health, education and social development is fundamental to improving adolescent service coverage and uptake to achieve UHC for adolescents.

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Understanding HIV prevention in high-risk adolescent girls and young women in two South African provinces

Authors

Anabel Gomezⁱ
Shawn Maloneⁱ
Ram Prasadⁱⁱ
Alok Gangaramanyⁱⁱ
Yolande Croucampⁱⁱ
Jeff Mulhausenⁱⁱⁱ
Paul Noble-Campbellⁱⁱⁱ
Divya Balakrishnanⁱⁱ
Aishwarya Shashikumarⁱⁱ
Pallavi Manchiⁱⁱ
Rasi Suranaⁱⁱ

Creating HIV prevention strategies that resonate with adolescent girls and young women requires an understanding of the factors influencing their decision-making and behaviour, particularly with respect to relationship management.

In South Africa, a disproportionate number of new HIV infections occur among adolescent girls and young women (AGYW). This study aimed to identify factors influencing uptake and effective use of HIV prevention in this group.

Research was conducted to explore the decisions and behaviours of AGYW, and key drivers and barriers to their uptake of HIV prevention behaviours and products. The study took place in KwaZulu-Natal and Mpumalanga provinces and included 240 high-risk AGYW (aged 15 - 24 years) and 135 influencers (male partners, matriarchal figures, nurses, and community health workers).

The analysis showed that participants cared primarily about the preservation and management of sexual relationships, but not explicitly about HIV prevention. Current HIV prevention methods often conflict with relationship goals,

making HIV prevention uptake and adherence challenging. Feelings of HIV risk are experienced as transitory 'blips', with benefits of prevention not tangible or well understood by AGYW, whereas the relationship rewards of high-risk behaviour are immediate.

Creating HIV prevention strategies that resonate with AGYW requires an understanding of the factors influencing their decision-making and behaviour, particularly with respect to relationship management. The study concluded that messages and interventions perceived to jeopardise or increase friction within sexual relationships are unlikely to resonate or effect behaviour change. In order to optimise the impact of HIV prevention messages and programmes, consideration should be given to the priority that AGYW with high-risk behaviours place on relationship preservation and management.

i AIDS Vaccine Advocacy Coalition

ii Final Mile

iii Upstream Thinking

Introduction

Data from a 2017 Human Sciences Research Council survey¹ indicate that HIV incidence among adolescent girls and young women (AGYW) in South Africa declined by 44% from 2012 to 2017. Despite this progress, incidence among AGYW remains relatively high (1.51% or 66 000 new infections in 2017), three times the rate found for young men (0.49% or 22 000 new infections in 2017). HIV prevalence and incidence (overall and in AGYW) are much higher in some settings, including in KwaZulu-Natal and Mpumalanga. This informed the site selection for this study.

Numerous studies have explored the dynamics surrounding young women and HIV prevention in clinical trials, demonstration projects, and service settings.²⁻⁵ The literature indicates that the partners of AGYW often influence the latter's interest in and ability to use HIV prevention products and strategies, and that for the women, preserving their relationships and maintaining trust can take priority over HIV prevention.⁶ In addition, AGYW tend to be more concerned about unintended pregnancy than acquiring HIV.

This chapter reports on findings from the qualitative research phase of a sequential mixed-methods study focused on understanding HIV-prevention decisions and behaviours among AGYW in KwaZulu-Natal (eThekweni, King Cetshwayo, Ugu, uMgungundlovu and Zululand districts) and Mpumalanga (Ehlanzeni and Gert Sibande districts).

Two hundred and forty AGYW were interviewed in groups of five across two age groups (15 - 19 years and 20 - 24 years). Eligibility criteria included participants who self-reported that they: were HIV-negative; were sexually active; had more than one sexual partner or knew that their partner had had additional partners in the previous 12 months; and had unprotected sex (sex without a condom) during that period. In addition, 135 influencers of AGYW were interviewed, including male partners (aged 20 - 35, with the AGYW partner five or more years younger than the man), matriarchal figures (aunts, mothers, older sisters), community health workers (CHWs), and urban and peri-urban-based nurses (directly involved with AGYW for a minimum of 12 months).

In order to develop a systematic understanding of the problem context, each research session incorporated three interdependent research methods, namely persona development,^{7,8} EthnoLab,^{TM,9,10} and journey framework.^{11,12} While the study provided an in-depth understanding of the factors conditioning the perspectives and actions of AGYW with high-risk behaviours, it did not assess the weight or prevalence of different factors.

Key findings

This study identified relationship management as the most likely decision-making frame and overarching motivation for the thoughts and actions (and often inaction) of AGYW related to HIV prevention. Motivation to implement preventive measures was transient and there was an asymmetry between motivation and actual risk. Unfortunately, there are no explicit or immediate rewards for preventive behaviours.

A five-stage journey was identified for AGYW in the study to achieve sustained HIV prevention behaviours. The journey includes clear milestones that, once reached, result in positive sexual relationships. However, the AGYW were not focused on HIV prevention in a sustained manner and balancing the adoption of healthy sexual behaviours while successfully navigating their relationships was challenging and affected attainment of the milestones identified. The findings were grouped according to the five main themes described below.

Preservation of relationships

The findings suggest that the primary goal for most AGYW in this study was the preservation and maintenance of their sexual relationship(s). Ceding control over sexual decisions and displaying trust in their partners emerged as important elements in maintaining these relationships.

For most AGYW participants, HIV acquisition was perceived as a distant, long-term, low-probability event. They indicated a strong preference for focusing on their immediate reality and goals, with their priority being to maintain their sexual relationships.

Focus of preventive action

Few participants explicitly associated the term 'prevention' with HIV. Rather, prevention was associated with preventing unintended pregnancy, and participants were more likely to report taking consistent and proactive steps to that end. In contrast, participants reported a more passive and reactive approach to HIV. Many had adopted HIV testing as a prevention strategy, characterising testing as more feasible and within their control than actual preventive behaviours such as condom use. Some also interpreted an HIV-negative test result as an indication that their approach to HIV prevention was already adequate, giving them a false sense of assurance and potentially reinforcing high-risk behaviours. Furthermore, many AGYW used subjective probabilities to distance themselves from risk and overestimated their ability to assess risk, e.g. judging by eye if a man looked healthy. This distorted risk perception

was sometimes challenged by a risk ‘blip’, for example if a woman contracted a sexually transmitted infection (STI) with someone who she felt was sexually healthy and safe. In these instances, AGYW may still make suboptimal risk-reward trade-offs because they may see prevention as a nil benefit with distant rewards, while costs are certain and immediate, especially relationship conflict.

Stages in development of HIV prevention awareness

A five-stage map was developed from the data findings, as described below. The stages and accompanying milestones are not linear, but involve a forward, backward and circular movement through stages and milestones (Table 1).

Early in the journey (stages 1 and 2), the AGYW were more concerned about the expectations of their male partners, and sometimes also those of peers and family members. Their responses suggest that many of them had unstable, unhealthy habits aligned with external influences, centred on what others want or expect, but that failed to provide effective protection against HIV. Comparison among the study participants revealed that the stage 3 milestone

was the pivotal point, after which AGYW began to practice healthy, habitual HIV prevention behaviours. This stage represents a shift from an external focus on the sexual desires and expectations of others, to an internal focus on one’s own needs and goals.

Those in the later stages of the journey (stages 4 and 5) had developed more of a sense of self-agency that allowed them to assess risk and act in alignment with their own needs and priorities. They had realised that a healthy sexual relationship could be achieved; however, the study found that they needed support to achieve this. On its own, the shift represented by stage 3 is insufficient to ensure sustained HIV prevention behaviour, since some AGYW still needed strong support to overcome possible risk underestimation and friction in their relationships.

Support networks

In the study, AGYW with high-risk behaviours reported having little support. Of the people who influence AGYW, those who are empathetic (e.g. peers) are not knowledgeable about relationships or HIV, and those who are knowledgeable (e.g. nurses) do not necessarily empathise. The study found that

Table 1: Five-stage journey to healthy relationship management and sexual health among AGYW at high-risk of HIV in South Africa

Journey stage	Journey milestone
<p>Stage 1: Shaping opinion</p> <p>As an adolescent girl forms her self-identity, she re-filters or rejects rules imposed on her by society. She educates herself and arrives at a new view of her relationship goals.</p>	<p>Milestone 1: Opinion formed</p> <p>Has formed her own opinion on relationships and how to manage them, as well as on what constitutes sexual health and which habits may be misguided or incorrect.</p>
<p>Stage 2: Seeing reality</p> <p>Uses her experience to assess the opinions she has formed, and to form her own rules for relationship and sexual health management.</p>	<p>Milestone 2: New resolutions</p> <p>Expresses new, idealised resolutions to protect her sexual health.</p>
<p>Stage 3: Re-calibrating relationships</p> <p>Explores how her resolution works in the real world in various contexts with different pressures and constraints. This entails forming new ways to deal with partners, driven by personal goals and the ability to cope with fallout.</p>	<p>Milestone 3: Embedding of rule</p> <p>No longer uses separate rules or exceptions for various partners but a single rule that protects her sexual health. This milestone represents the ‘big flip’ from being externally focused to internally focused, with her own needs prioritised.</p>
<p>Stage 4: Embedding habits</p> <p>Continues to adhere to her own rules for sexual health decisions, and decisions become habitual rather than deliberate. She tries to make new choices aligning her relationship with her goals.</p>	<p>Milestone 4: Lifestyle realigned</p> <p>Lifestyle choices are aligned with goals. Exhibits predominately consistent and healthy sexual relationship habits.</p>
<p>Stage 5: Evolving habits</p> <p>Consistent adherence to her own sexual health rules, with the tools, confidence and insight to adapt as necessary.</p>	<p>Milestone 5: Continually evolving</p> <p>Continues to evolve strategies and rules according to life and changing circumstances, while adhering to and supporting her larger goals. She consistently makes decisions that are positive for her.</p>

male partners, who wield the most influence over AGYW with respect to HIV prevention, are largely a negative influence, either subtly undermining or overtly opposing any efforts that the young women may be inclined to undertake. In general, there are few social networks to support sexual health decisions among AGYW, and one of the biggest factors against AGYW appears to be the absence of favourable social norms in this regard.

Influencers

Matriarchs and healthcare providers

The research suggests that matriarchs and healthcare providers tend to have a poor view of the cognitive abilities of AGYW, which often leads them to communicate in authoritative and didactic ways and to resort to warnings. AGYW reported feeling this lack of empathy and therefore being more reluctant to seek the help or advice of these influencers. Nurses and matriarchs also noted the multiple negative forces, such as male partners and peer pressure, driving AGYW behaviour, against which the young women felt powerless. The generally positive intention among matriarchs, namely to protect AGYW, was often compromised by their role as parents and their difficulty speaking with AGYW on sexual matters. AGYW often viewed matriarchs as authority figures with inflexible views and anticipated that the older women would advocate abstinence.

In some instances, sexual topics were seen to be taboo in the immediate circle of the AGYW, driving them to approach the health system with an expectation of privacy. However, the clinics appeared unapproachable and overburdened, and seemed to offer little privacy. CHWs were generally seen as a credible source of information and were regarded more as peers and thus easier to relate to than others in the health system; however, an empathy gap still seemed to exist.

Male partners

Participants indicated that their male partners played the most significant role in influencing their behaviour. Most saw their partners as having more control in the relationship than they did, and they generally reported acquiescing to their partners' sexual health preferences. Women characterised male partners as a negative influence, either subtly undermining or overtly opposing any efforts that AGYW were inclined to undertake.

Conclusion

Results indicate that AGYW in the study prioritised maintaining and managing sexual relationships over preventing HIV. Participants did not appear to be focused on HIV prevention in a sustained manner or as a meaningful priority. At most, HIV was one element within a secondary area of overall sexual health (preventing pregnancy, avoiding STIs and HIV), while successfully navigating relationship(s).

Relationship management was the primary decision-making frame and overarching motivation for their thoughts, actions (and often inaction) related to HIV prevention.

Recommendations

The qualitative stage of this research led to recommendations for ways in which programmes can better support AGYW with HIV prevention in healthy relationships. These recommendations will be refined through additional phases of the project.

Contextualising prevention for AGYW

- Align HIV prevention options and service-delivery channels with the expressed relationship goals of AGYW.
- Focus on building the coping ability of AGYW within relationships so that they can handle situations that challenge their positive HIV-prevention choices. Design programmes and messages that reward and reinforce healthy sexual behaviours and that strengthen the ability of AGYW to cope with tangible and intangible costs of using prevention, e.g. partner mistrust or relationship friction.

Messaging

- Reframe communication on HIV prevention to align with the relationship goals of AGYW and address how to balance relationships and sexual health successfully.
- When introducing HIV prevention strategies in family planning settings, consider the different risk perceptions AGYW assign to unintended pregnancy and HIV.
- Move away from HIV-related communication that focuses predominantly on 'test and treat' and primes a reactive rather than preventive strategy, and move toward more proactive, self-protective behaviours. Frame HIV testing as part of the prevention journey rather than as an end point.
- Use 'trigger events', such as STI treatment, as an opportunity to initiate HIV prevention.

Support

- Incorporate holistic advice and support with managing relationships and sexual health into programmes, rather than focusing solely on HIV prevention.
- Strengthen potential influencers to become both knowledgeable and empathetic, for example, through the following:
 - Develop new models to re-skill CHWs and align their incentives, e.g. remuneration or promotion, to highlight HIV prevention.
 - Help to bridge the 'empathy gap' between influencers and AGYW by helping influencers understand the realities of AGYW lives, and how their own behaviours can impact AGYW decision making.
 - Support development of active listening skills that promote open, two-way communication that is more consistent with AGYW interests and styles.

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Population ageing in South Africa:

trends, impact, and challenges for the health sector

Authors

Geetesh Solanki^{i,ii}
Gabrielle Kellyⁱⁱⁱ
Judith Cornell^{iv}
Emmanuelle Daviaudⁱ
Leon Geffenⁱⁱⁱ

With more South Africans living past the age of 60, the country faces a growing chronic disease burden. Further research and action are needed for the health system to address the budgetary and social strains of this phenomenon effectively.

Despite the predicted impact of population ageing, namely that it will increase the disease burden related to chronic and multiple chronic conditions, there has been limited research on this issue in South Africa and on the implications for health systems planning and budgeting. Forecasts from Statistics South Africa (Stats SA) suggest that from 2002 to 2022, the population will have increased by 33.8% (1.47% per annum), the relative expected expenditure will have increased by 41.7% (1.76% per annum), and the impact of ageing on expected expenditure over the period will be 7.9% (0.29% per annum).

This chapter reviews key issues, research, and policies related to care of older adults (aged 60 years and over)

in South Africa, and uses Stats SA population forecasts to assess ageing trends. In the absence of suitable public-sector data, private-sector data have been used to model and illustrate the possible impact of the ageing population on morbidity and expected healthcare expenditures and the resulting challenges for health services. Population ageing will increase the disease burden related to chronic and multiple chronic conditions, and consequently increase demands on the healthcare system and health budget. Recommendations include the need for further research to inform the health system's response to the needs of older persons, the promotion of self-management and ageing in community settings, and more education and training in geriatric care and gerontology.

i Health Systems Research Unit, South African Medical Research Council
ii Health Economics Unit, School of Public Health and Family Medicine, University of Cape Town
iii Samson Institute for Ageing Research
iv Independent Consultant

Introduction

Populations in most low- and middle-income countries (LMICs) are ageing rapidly,¹ and ageing is an established risk factor for the development of multiple chronic diseases. The diagnosis and management of chronic diseases places a significant burden on affected individuals and the healthcare system. Understanding the impact of this phenomenon is important for health systems planning but there has been little research on this issue in South Africa.

This chapter provides an overview of the literature on ageing and health; analyses ageing trends and forecasts for the South African population; maps the impact of ageing on morbidity and expected expenditure; and examines the challenges that this poses for health services.

Background

Increased longevity and decreasing fertility rates have resulted in ageing populations globally.^{2,3} This change in population structure, and its associated economic, social and health-systems implications, are of growing concern to policymakers worldwide.^{4,5} Population ageing is taking place three times faster in LMICs than in developed countries.⁶ This trend is demonstrated in Figure 1, which compares the rapid rate of ageing in China, Brazil and India with the slow

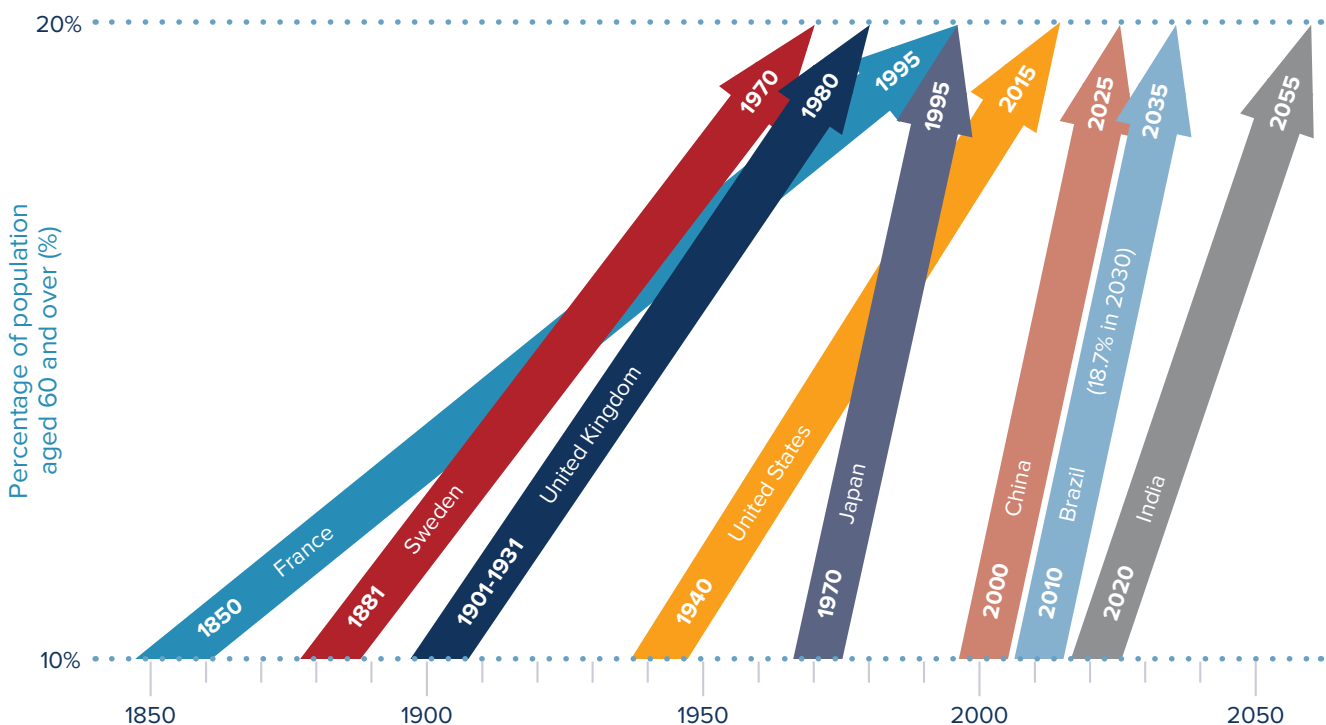
rate in high-income countries. In addition to this slower rate, high-income countries have had a relatively long lead time to plan for the demographic shift.

It is expected that Africa's population of older adults will more than triple, from 46 million in 2015 to 157 million by 2030.⁷ There is a link between a high prevalence of chronic disease, disability and ageing, and an increase in the care burden.⁶ Poor health leads to lower quality of life and levels of well-being and higher levels of disability among older adults, especially among the poor.⁸ Data from the 2011 census indicate that 40% of older adults in South Africa are poor.⁹ High rates of unemployment and the impact of HIV have left older adults with significant care and financial responsibilities as they use their pensions and time to support their children and grandchildren, with a measurable impact on their well-being.¹⁰

In response to the phenomenon of ageing populations, a large body of literature has emerged on the demographic aspects of ageing, and health systems, economic and social implications.¹¹ Research in Europe and North America has shown that older adults have a different set of health needs from the younger population,¹² but much less is known about these needs and existing care gaps in LMICs.¹³

In response to these data gaps, a number of research collaborations have focused on generating longitudinal and cross-country data on ageing in developing countries. These collaborations include the World Health Organization's (WHO) Study on Global AGEing and Health (SAGE),¹⁴

Figure 1: Period required for the 60+ population to increase from 10% to 20% globally, 1850 - 2050



Source: Adapted from WHO, 2015.¹

the INDEPTH Network, and Health and Aging in Africa: Longitudinal Study of an INDEPTH Community in South Africa (HAALSI).^{a,15} We conducted a literature review of studies done on the health, functioning and wellbeing of older persons in South Africa from 2006 and found only 19 studies, 12 of which are INDEPTH WHO-SAGE and HAALSI studies. This indicates that research on the health and health needs of older adults in South Africa remains sparse and that there is a lack of information on disease, disability and health risks in the older adult population.

Ageing trends in South Africa and potential impact on expected expenditures

Projected ageing trends for the South African population

Statistics and forecasts provided by Statistics South Africa (Stats SA) in the Mid-Year 2018 Population Estimates Report were used to assess ageing trends for the South African population. The report estimates South Africa's population at 57.3 million people, 8.3% of whom are aged over 60 years.¹⁶ Table 1 shows the changing age profile of the population from 2002 to 2022 (the limit of Stats SA forecasts).

Over this 20-year period, the number and proportion of older adults in South Africa increased from 3.3 million (7.2% of the population) in 2002 to 4.0 million (7.7%) in 2012, with

a forecast increase to 5.7 million (9.1% of the population) by 2022. Thus the projected increase in the number of older adults over the period is 69.9%, compared with 31% for the under-60 population. The growth rate of the over-60 population is 2.7% per annum, nearly twice the rate for the population under 60 (1.4%). The WHO World Report on Ageing and Health¹ presents an even more serious picture of the impact of ageing in the longer term, projecting that the number of older adults in South Africa will increase to 15.4% of the population by 2050.

Ageing, morbidity and health expenditure

Ageing is an established risk factor for the development of multiple chronic diseases.¹⁷ In the public sector, data on these conditions are not disaggregated by age, making it difficult to assess the impact of ageing on disease profiles, and consequently on health services and expenditure in the public sector. However, these data are collected in the private sector and private-sector data were used in this study to analyse the impact of ageing on the whole population, subject to a number of caveats, which are examined in greater detail later in this chapter.

Data used for the analysis were extracted from the medical claims and member records held in the data warehouse of NMG Consultants and Actuaries, an independent firm providing consulting and actuarial services to 10 private health insurance funds covering about half a million people (~5% of the privately insured population). The data were accessed in terms of and under the conditions set out in the consulting agreement between NMG and their client

Table 1: Stats SA population forecast by age and year, 2002 - 2022

Age band (years)	Year			Movement (2002 - 2022)	
	2002	2012	2022	N	%
0 - 4	4 746 954	5 782 776	5 811 973	1 065 019	22.4%
5 - 14	10 268 042	9 787 134	11 765 151	1 497 108	14.6%
15 - 44	22 193 311	26 258 925	30 036 493	7 843 182	35.3%
45 - 59	5 280 643	6 546 011	8 039 148	2 758 505	52.2%
60+	3 276 760	4 034 879	5 567 771	2 291 011	69.9%
Total	45 765 710	52 409 724	61 220 537	15 454 826	33.8%
Total under 60	42 488 950	48 374 845	55 652 765	13 163 815	31.0%
Total over 60	3 276 760	4 034 879	5 567 771	2 291 011	69.9%
% under 60	92.8%	92.3%	90.9%		
% over 60	7.2%	7.7%	9.1%		

Source: Stats SA, 2018.¹⁶

- a HAALSI is a multinational collaborative study being undertaken in Agincourt, South Africa to evaluate the effects of biological, social and economic determinants of chronic disease on the function and health of ageing populations. INDEPTH is a global network of health and demographic surveillance systems in 19 LMICs.

schemes and a confidentiality agreement between NMG and the principal investigator for this study (GS). Only secondary, de-identified data were used for the study and at no point was confidential scheme or member information disclosed. Ethics approval for use of the database to carry out this study was granted by the Ethics Committee of the South African Medical Research Council (project registration number EC001-1/2019).

A check was done to ensure that the sample could be used to represent the whole private insurance group. This was accomplished by comparing the average contributions, healthcare expenditure and age distribution of the study sample with the broader private health insurance membership, using the Council for Medical Schemes (CMS) Annual Report.¹⁸ All claims submitted for healthcare services rendered or items dispensed to members of the 10 health insurance funds in all nine provinces over the period January - December 2015 were collated and analysed to produce the results in this chapter.

Prevalence of chronic conditions was used as an indicator of the level of morbidity. The CMS has regulated that all medical schemes must cover medical costs related to the treatment of 27 Chronic Disease List (CDL) conditions.¹⁹ These conditions include cancer, diabetes, hypertension and mental health conditions, among others. Based on algorithms published by the CMS²⁰ for identifying individuals with CDL conditions, all of the possible CDL conditions of the individuals in the dataset were identified, and each person was then assigned to one of three health categories:

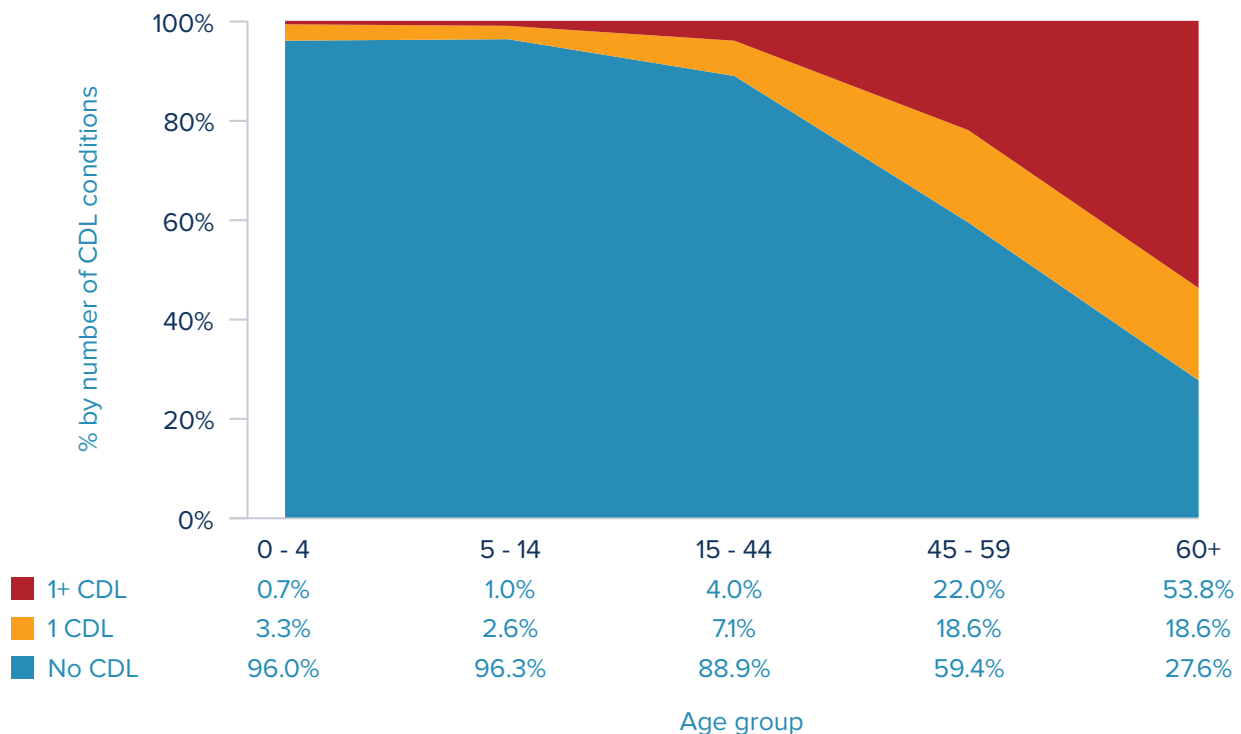
no CDL conditions (no CDL), one CDL condition (1 CDL), and more than one CDL condition (1+ CDL). Figure 2 shows the distribution of the three health categories by age.

Two patterns are clearly evident from the analysis: with increasing age there is an overall increase in the proportion of individuals with chronic conditions and an increasing proportion of individuals with co-morbidities, i.e. more than one chronic condition. Older adults are more than twice as likely as under-60s to develop one chronic condition, 7.6 times more likely to develop multiple chronic conditions, and overall nearly five times more likely to develop a chronic condition (1 CDL or 1+ CDL).

The claims received on behalf of the individuals in the dataset were used to assess expenditure patterns, broken down by age and number of CDL conditions (Table 2).

The results indicate that development of a chronic condition results in a substantial increase in expenditure (on average 3.17 times higher than for those with no chronic conditions) and that development of co-morbidities increases this even further (on average 5.52 times higher than for those without chronic conditions). Although varying in magnitude, this pattern was evident across all age groups. The average expenditure of R16 570 for over-60s with no CDLs is almost double that for under-60s, possibly reflecting the fact that many diseases (e.g. dementias, musculoskeletal disorders and frailty) affecting older adults are not recognised as CDLs.

Figure 2 : Number of CDL conditions by age group in the South African private sector, January - December 2015



The analysis above shows that ageing of the South African population will increase the risk of the development of chronic and multiple chronic conditions and that this is likely to have a significant impact on the demands placed on the healthcare system.

Modelling impact of ageing on expected expenditures for the whole population

As indicated above, in the absence of an age breakdown of public-sector health expenditure, modelling must be

used to estimate the impact of ageing. To illustrate the potential impact of ageing on expected expenditures, the shape of the expenditure breakdown by age in the private-sector sample (which is similar to that reported elsewhere internationally²¹) was applied to the South African population profile as a whole. The underlying assumption in this modelling exercise is that the shape of expenditure for the South African population as a whole is similar to the private-sector shape. Limitations of this assumption are addressed in the next section of the chapter. Using this approach, the

Table 2: Health expenditure patterns by age group and number of CDL conditions in the South African private health sector, January - December 2015

Age band (years)	Expenditure (Rands) ^a			Expenditure ratio (v. no CDL)	
	No CDL	1 CDL	1+ CDL	1 CDL	1+ CDL
0 - 4	11 545	195 616	127 919	16.94	11.08
5 - 14	4 036	16 945	41 442	4.20	10.27
15 - 44	9 337	25 784	53 204	2.76	5.70
45 - 59	11 356	22 930	46 215	2.02	4.07
60+	16 570	29 661	53 426	1.79	3.22
Total	9 377	29 754	51 795	3.17	5.52
Under 60	8 815	29 803	48 832	3.38	5.54
Over 60	16 570	29 661	53 426	1.79	3.22

a Average expenditure (Rands) per individual per year.

Table 3: Impact of population growth and ageing on relative expected expenditure for the South African population, 2002 - 2022

Age (years)	Relative expenditure weighting	2002		2022	
		Lives	Relative expected expenditure ^a	Lives	Relative expected expenditure ^a
0 - 4 ^b	1.00	4 746 954	4 746 954	5 811 973	5 811 973
5 - 14	0.26	10 268 042	2 647 082	11 765 151	3 033 034
15 - 44	0.66	22 193 311	14 739 580	30 036 493	19 948 592
45 - 59	1.15	5 280 643	6 059 378	8 039 148	9 224 680
60+	2.10	3 276 760	6 893 408	5 567 771	11 713 069
Total		45 765 710	35 086 403	61 220 537	49 731 349
Total increase: 2012 - 2022				33.8%	41.7%
Increase per annum				1.47%	1.76%

a Relative expected expenditure: number of lives x relative expenditure weighting.

b Reference group for relative expenditure weighting.

study estimated the 'relative expected expenditure' for the South African population as a whole in 2002 and 2022 and then assessed the impact of ageing on the relative expected expenditure. The forecasts resulting from the modelling exercise are summarised in Table 3.

From 2002 to 2022, the population is expected to increase by 33.8% (1.47% per annum). Over the same period, the relative expected expenditure is expected to increase by 41.7% (1.76% per annum). The impact of ageing on expected expenditure over the period is therefore 7.9% (0.29% per annum).

Challenges and necessary steps

The analysis above shows that the South African population is ageing. This will increase the prevalence of individuals with multiple chronic conditions and is likely to have a significant impact on the demands placed on the healthcare system. The literature review showed that there has been little research and policy development on ageing and older adults in South Africa. There is thus an urgent need for research, policy development and planning to address the challenges posed by an ageing population. In recent years, considerable resources have been put into planning for under-fives, especially in the first 1 000 days of life (morbidity and healthcare expenditure statistics bear out the need for this focus). A similar level of research and planning needs to be applied to the later years of life, with strategies to mitigate the impact of increased demands on healthcare services.

Research areas

To illustrate the impact of ageing on expected expenditures for the population, private-sector expenditure patterns were used to extrapolate for the population as a whole, as public-sector data are not available. Further research should be undertaken on actual by-age costs in the public sector as the latter may have different patterns from the private sector. The difference between the public and private by-age expenditures is likely to reflect two dynamics. The first is the extent of unmet needs in the public sector, for example public policy does not allow for dialysis for over-60s. The second is the skewing towards hospital and specialist care rather than primary care in the private sector.²² Further confounding factors include the increasing number of HIV patients on antiretroviral therapy (ART) surviving into older age in the public sector; and in the private sector, the number of conditions not covered by Prescribed Minimum Benefit (PMB) legislation, which has an impact on the health of older adults. These limitations, as well as our general findings, indicate the need for further research in the following areas:

- public-sector spending patterns by age, condition and level of care;
- research into lessons emerging from public and private sector data that may improve cost efficiencies in both sectors;
- prevalence of conditions, especially key diseases affecting older adults; and
- indicators of functional ability, communication difficulties, and the cognition, mood and health status of older adults.

Policy development and implementation

The South African Policy for Older Persons was developed in 2005²³ after South Africa signed the political declaration adopting the Madrid International Plan of Action on Ageing in 2002.²⁴ However, outside of the limited parameters of the Older Persons Act of 2006,²⁵ no further policy or legislation has been developed to address these gaps, and little of the plan has been implemented. There is also little acknowledgement or provision for the particular needs of older persons in health- or mental health-related legislation or policy. The vision of the National Development Plan 2030 is to increase life expectancy from 61 to 70 years, but no clear strategies have been developed on how the Department of Health or Department of Social Development will meet the health needs of an ageing population.²⁶

The Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2013 - 17²⁷ outlines the South African government's strategy for addressing non-communicable diseases among the general population; focus is placed on key risk factors such as alcohol abuse, use of tobacco, unhealthy diet and physical inactivity through increased education, outreach and early intervention at primary care level. While there is no specific focus on population ageing as a risk factor, or the specific needs of older persons, in theory these plans should lower the risk of chronic disease in the older population. However, implementation of the plan and related policies has been poor.

There is an urgent need to implement the South African Plan of Action on Ageing based on the commitments made in the Madrid Declaration.²⁸ South Africa is also committed to establishing a framework for healthy ageing based on the WHO Global Strategy and Action Plan on Ageing and Health adopted by the 69th World Health Assembly in 2016.²⁹ Simple and low-cost solutions are needed to promote healthy ageing, to provide quality health and social care to the rapidly growing number of older adults in South Africa, and to address the impending health and social welfare burden of ageing in resource-poor settings. Some suggestions for policymakers are provided below.

b Intrinsic capacity is defined by the WHO as "the composite of all the physical and mental capacities that an individual can draw on," while functional ability refers to the intrinsic capacity of the individual, the environment of the individual, and the interactions between them.

Promote self-management and ageing in community settings

The WHO has identified the optimisation of intrinsic capacity⁹ and functional ability through early intervention at community or primary care level as the key to healthy ageing and to reducing healthcare costs and care dependency.¹ Preserving the intrinsic and functional capacity of older people through early intervention and supporting self-management will allow older adults to continue to be healthy and active for longer periods and reduce the need for expensive hospitalisation or frail care.

Higher-income countries are dealing with higher costs of care for older adults by building systems intended to keep them in their communities for as long as possible.^{30,31} International experience has shown that although delivery can be difficult, community-outreach and multi-dimensional assessment at primary care level can add significant value to older adults, facilitate access to medical care and social support, improve health and well-being, and potentially reduce the individual and societal effects of disability and dependence.

In line with international trends, the South African Older Persons Act (2006)²⁵ promotes ageing in place and encourages community and home-based care, rather than residential care for older adults. However, in reality, the non-governmental organisations (NGOs) and private facilities that provide these services are underfunded, and both community-based and residential-based care systems remain weak. The White Paper on Families (2013)³² proposes that family support should reduce the burden of care (including elder care) on society, with the role of the state being to support families to provide that care. However, there is little guidance on how to support caregivers in the current White Paper.³²

To promote ageing in community settings, more detailed policies need to be developed and more resources need to be directed both to the community and at household level to support provision of quality health, social services and care.

Supporting older adults to be active and healthy allows them to be valuable resources in their communities, providing child care support to working parents and potentially providing peer support to other adults. Peer-support programmes have been shown to lead to improved health, function and social outcomes among older adults,^{33,34} and receiving even nominal payment for doing this work in community settings could increase financial wellbeing.

Improve health system response to the needs of older persons

In most countries (including South Africa) health systems (particularly primary health care) are not well designed for older adults, who often have multiple and chronic morbidities and may not present in a typical fashion.³⁵

Health insurance coverage among the older population in South Africa is low, and 80% are reliant on the public health system.³⁶ Although public health care is free to older people in the public health system, they struggle to access quality care because of health-system capacity constraints and age-related barriers to access. These include challenges related to waiting times, health-worker shortages and related time constraints, transport to clinics, lack of medication, age-related rationing of certain interventions, a lack of geriatric training, and a general lack of expertise in the management of multi-morbidity.³⁷

While recent research on people's perception of health and use or experience of healthcare services in South Africa is limited, existing studies indicate high levels of dissatisfaction, low levels of quality of care, and a lack of trust in public healthcare professionals in both rural and urban settings.^{38,39} One particularly revealing South African study demonstrated that HIV-positive older adults receiving ART were in fact in better health because they received more support and closer follow-up than HIV-negative older adults.⁴⁰

To improve the health system's response to older adults, there is a need to provide comprehensive and multi-disciplinary interventions at primary care level that take the bio-psychosocial aspects of health into account and that focus on individual needs rather than individual health conditions.⁴¹

This study supports the WHO's recommendation that focus on physical and mental capacity can help facilitate coordinated health interventions.⁴² At clinical level, integration can happen through comprehensive health and wellness assessments of older adults to understand their intrinsic capacity and functional ability. These assessments can be conducted at primary care level by community health and social workers and the results used to develop multidisciplinary care plans that can be shared with relevant health and allied professionals. Service provision could be coordinated through clinic sessions dedicated to integrated geriatric services, avoiding the need for older adults to attend multiple chronic disease clubs as is currently the case.

Improve healthcare worker training

The growth of geriatric health care and training of health and social professionals in the field of ageing in South Africa has been severely stunted over the past few decades. There is little specialised training in geriatrics available in Africa and limited undergraduate focus on geriatric issues in medical training.⁴³ As a result, health issues affecting older adults, including mental health problems and dementia, are often undiagnosed or overlooked in primary care settings.⁴⁴ Healthcare workers may also have negative attitudes towards older adults, which can affect care.⁴⁵

The International Association of Gerontology and Geriatrics supports the African Union and WHO in recommending that all health and social professionals must be familiar with older adult care, irrespective of their specialty.⁴⁶ Determined efforts are required to initiate change at provincial and national level, and in educational institutions. The following suggestions should be considered:

- Engagement with the National Department of Health and Department of Social Development to recognise and drive initiatives regarding geriatric and gerontology education and training.
- Engagement with heads of departments at training institutions to facilitate discussion on institutional challenges and successes with elder care.
- Initiation of public discussions on geriatric and gerontology curricula in South Africa and the way forward in implementing the curricula.

Promote uptake of the grant-in-aid

One area where South Africa caters well for the needs of older adults is social assistance: almost 3.5 million people over the age of 60 receive means-tested, non-contributory and relatively generous social pensions or older persons grants.⁴⁷ Social grants have been shown to reduce poverty significantly among vulnerable older adults and their households.⁴⁸ The grant-in-aid is an additional amount of R420 per month available to pension recipients with functional limitations who require full-time care. This money can support community-based care by helping to compensate family members for their care work or subsidise the cost of a caregiver.

However, uptake of the grant-in-aid is very low (215 268 recipients in December 2018)⁴⁷ due to poor awareness and bureaucratic obstacles.⁴⁹ An awareness campaign and simplification of bureaucratic processes could go some way towards increasing access to the grant-in-aid.

Conclusion

This chapter has only begun to explore the implications of an ageing population for health and social services. Without proactive planning and intervention to mediate the impact, population ageing will further increase the strain on the healthcare system. In a resource-constrained environment, there will then be three choices: allocate greater resources to health care; allocate a greater portion of healthcare resources to care for older adults; or allow an ever-greater portion of older-adult needs to go unmet.

If we are going to address the challenges posed by the ageing population timeously, especially in a situation of limited resources, we need to act now. We need better data, improved inter-sectoral collaboration, better training of health and social workers, and recognition of older adults in the health policy framework.

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Clinical associates in South Africa:

optimising their contribution to the health system

Authors

Zuki Tshabalala^{i,ii}
Scott Smalleyⁱⁱⁱ
Murray Louwⁱⁱ
John Capati^{iv}
Richard Cooke^v

As a resource, clinical associates are less costly than doctors, and provide good value, but their potential is only fully realised through appropriate supervision and leadership.

This chapter considers the role of the clinical associate in achieving sustained improvement on healthcare indicators in South Africa, and in the context of the Human Resources for Health 2030 strategy.

An integrated and clinically intensive three-year undergraduate training programme provides each clinical associate with sound generalist competencies in management of common conditions in the district health system. Clinical associates work under supervision and mentorship of a medical practitioner, and further training is augmented by postgraduate opportunities currently under development. Efficiency, effectiveness and equity each provide a lens through which the clinical associate role is considered within the South African health system.

As a resource, clinical associates are less costly than doctors, and provide good value, but their potential is only fully realised through appropriate supervision and leadership.

Increased production and better distribution in a blended public/private healthcare system under the proposed National Health Insurance will provide a foundation to harness the clinical associates' contribution to universal healthcare coverage. Quality of care requires teamwork and communication, and including clinical associates in the human resource organogram calls for close attention to these collaborative practices.

After a 10-year period and over 1 000 graduates, the 2018 Clinical Associate National Task Team Report provides a summary source for much of the evidence. This experience now allows scope of practice and job descriptions to be clarified, and the prescribing authority to be properly regulated.

i Professional Association of Clinical Associates in South Africa
ii Department of Family Medicine, University of Pretoria
iii Division of Clinical Associates, University of the Witwatersrand, Johannesburg
iv American International Health Alliance
v Department of Family Medicine and Primary Care, University of the Witwatersrand, Johannesburg

Introduction

South Africa has made significant strides towards improving health outcomes, particularly in the areas of HIV and tuberculosis (TB).¹² However, this improvement has not been widespread^{3,4} and initiatives to strengthen the health system through primary health care (PHC) re-engineering and the ramping up of services in National Health Insurance (NHI) pilot sites have met with limited progress,^{5,6} reinforcing the perception that the challenges in our health system are intractable.⁷

Shortages of healthcare workers and their maldistribution between the public and private sectors and urban and rural areas are persistent challenges facing our health system.⁸⁻¹⁰ The current focus on developing a new human resources for health (HRH) strategy for the next decade, and the phased introduction of universal healthcare coverage (UHC), provide a strategic opportunity to explore innovations and solutions to some of the country's healthcare challenges.

This chapter provides an overview of clinical associates in South Africa, including their training, scope of practice, and impact on the health system. Primary and secondary data sources were used in the study, originally compiled for a 2018 briefing report by the Clinical Associate National Task Team.¹¹ The chapter focuses on the contribution of clinical associates towards improving the efficiency, effectiveness (including quality) and equity (including access) within the health system. Finally, recommendations are made to strengthen the role of these health workers and to improve their training in order to enhance their contribution.

History of clinical associates

Health professionals similar to clinical associates have existed globally for more than 100 years and provided essential medical care, particularly in rural and underserved regions.¹² Professional titles vary from country to country, with the lack of a unifying global term limiting universal recognition and respect.¹³ Historically, clinical associates fall under the term 'mid-level health worker', defined by the Global Health Workforce Alliance as "a group of cadres who are trained for two-to-five years to acquire basic skills in diagnosing, managing common conditions and preventing disease".¹⁴ Development of clinical associate training and scope of practice in South Africa were modelled after similar health professionals in Africa, the USA and the Netherlands.¹⁵

Clinical associates in South Africa

The first clinical associate training programme in South Africa began in 2008, and graduates began providing

medical care in the country from 2011. Each year between 70 and 140 clinical associates graduate with a Bachelor of Clinical Medical Practice (BCMP)^a degree and register with the Health Professions Council of South Africa (HPCSA) under the Medical and Dental Professions Board to practice medical care supervised by medical practitioners. Medical practitioners serve in both an advisory and supervisory role and are responsible for the acts of their clinical associates.

Clinical associate undergraduate programmes are offered by Walter Sisulu University, the University of Pretoria and the University of the Witwatersrand (Wits), which has also recently started a BCMP Honours programme in Emergency Medicine. Clinical associates are currently supported by the Professional Association of Clinical Associates in South Africa (PACASA), which was established in 2012. The Association serves as the profession's representative body, advocating for its recognition and development. However, the organisation is in its infancy and requires support from relevant stakeholders to be effective and functional.

Clinical associates deliver PHC and manage common illnesses and diseases prevalent in South Africa. Their tasks include patient consultations, counselling, skilled clinical procedures, pharmacotherapy and surgical assistance.¹⁶ Patients are treated according to standard protocols, enabling doctors to focus on caring for patients with complex conditions. As of December 2018, there were 1 071 clinical associate graduates in South Africa, with more than 80% providing health care spread across all nine provinces in the country.¹⁷

Training of clinical associates

In partnership with universities, the Medical and Dental Professions Board of the HPCSA developed core competencies for undergraduate training in 2014.¹⁸ These competencies provide a framework for clinical associate, dentistry and medical curricula, to measure the academic and clinical performance of students. In addition, regulations regarding the scope of practice for clinical associates were gazetted and signed by the Health Minister in 2016,¹⁹ stipulating that the clinical associate may: "perform any act delegated to him or her by the supervising medical practitioner in accordance with the education, training and experience of the clinical associate".¹⁹

In addition to the HPCSA competencies, clinical associate undergraduate curricula incorporate six Entrustable Professional Activities (EPAs) that describe the work of a health professional who is trusted to carry out tasks safely and efficiently.²⁰ These EPAs are used as learning objectives to measure student competence (Table 1).

a Bachelor of Medicine in Clinical Practice (BMCP) at Walter Sisulu University.

Clinical associates are educated in work-based clinical practice, underpinned by a sound understanding of family medicine principles. The BCMP degree is a three-year programme, with an emphasis on diagnosing and managing common medical conditions. The students become competent in over 180 different diagnostic and therapeutic procedures. Most of the clinical associate training occurs in the public healthcare service, often in underserved and rural areas. The training prepares clinical associates for universal provision of promotive, preventive and curative health services at all levels of district and primary care. Clinical associates are trained to deliver 12 of the 16 community health centre services proposed in NHI.¹¹ This cadre is 'fit for purpose' to deliver primary care immediately upon graduation.

Clinical associate students spend at least 50% of their training in practice settings (mostly district hospitals) from their first year of training. Curricula place a strong emphasis on problem-based learning to integrate and reinforce the

application of basic health sciences knowledge in the clinical context, as well as emphasising the importance of inter-professional practice.

From 2011, the three universities training clinical associates have administered a joint national examination for graduating third-year students. This ensures that all graduates demonstrate the same minimum standard of competency, and it promotes a platform of common understanding for the role of the clinical associate by all other stakeholders. This common exam is unique in South African undergraduate health science training.

Using the evidence-based principles underpinning the Workforce Indicators of Staffing Need (WISN),²² the Clinical Associate National Task Team estimated that 11 500 clinical associates would be needed by 2030.¹¹ When calculating these estimates, the Task Team considered the importance of clinical associates in the skills and cadre mix of healthcare teams in relation to NHI roll out and UHC. There is a need to increase

Table 1: Entrustable Professional Activities (EPAs) for clinical associate training, South Africa, 2019

1. Perform patient assessment	1.1 Perform triage for all patient encounters
	1.2 Obtain a complete and/or focused patient history
	1.3 Perform a complete and/or focused physical examination
2. Manage patients comprehensively	2.1 Formulate a comprehensive patient management plan
	2.2 Prescribe appropriate medications
	2.3 Perform investigative and therapeutic procedures and interpret results
	2.4 Execute continuous patient care, including care of complications; referrals; follow up; and rehabilitative and palliative care
3. Promote health	3.1 Foster individual health
	3.2 Foster community health
4. Facilitate communication and collaboration	4.1 Foster rapport, trust and ethical relationships with patients, families and communities
	4.2 Provide appropriate counselling
	4.3 Collaborate within a multidisciplinary healthcare team
5. Improve healthcare services	5.1 Produce and maintain clinical records to improve the quality of healthcare services
	5.2 Collect and analyse data to improve the quality of healthcare services
	5.3 Understand healthcare systems
6. Develop professionally	6.1 Engage in continuous learning
	6.2 Practice professionalism
	6.3 Practice ethically

Source: Smalley S, BCMP Course Guide 2019.²¹

the number of graduates from 150 to 1 500 per year in order to reach the 11 500¹¹ clinical associates needed to contribute significantly to improvements in the healthcare system. For example, if 10 universities each train 150 clinical associates annually from 2022, approximately 11 500 clinical associates will be trained by 2030. This number compares favourably with the estimate of approximately 11 470 who could be employed in the different facilities in South Africa¹¹ (Table 2).

Contributions and challenges

In 2018, the Clinical Associate National Task Team, supported by the National Department of Health (NDoH), produced a comprehensive report detailing the contributions clinical associate graduates have made to the South African healthcare system.¹¹ The report also described current challenges faced by the profession, including reduced government posts, limited prescription rights, and uncertain career path, which reduce morale for the clinical associate profession.¹¹ The Task Team report noted that this cadre of staff is well placed to contribute to the efficiency, effectiveness and equity goals of UHC through the intended NHI, and this chapter provides a comprehensive strategy to increase awareness and understanding of the added value provided by clinical associates.¹¹

Efficiency

An efficient health system demonstrates high value in relation to its use of resources.²³ Two ways to achieve this

are by increasing outputs and reducing costs, and clinical associates are well placed to contribute to both.²⁴⁻²⁶

Increasing outputs

Clinical associates perform less complicated tasks that would otherwise consume medical practitioners' time, allowing doctors to work with their multidisciplinary teams to address more tasks of varying complexity and duration. This frees up time for doctors to assume other tasks while also supervising clinical associates.^{13,27,28} Studies done on the transfer of tasks from doctors to similar cadres suggest a 50 - 76% reduction in the time doctors spent on less complex tasks²⁴ (Figure 1).

A strength of clinical associates is their generalist undergraduate training to meet the healthcare needs of South Africa. For example, HIV-specific tasks are among the many medical components absorbed by clinical associates, including testing, initiation of antiretroviral therapy (ART), adherence counselling, regimen change, opportunistic infection management and circumcisions.^{25,29}

A 2013 survey in the Eastern Cape found that each clinical associate provided care to approximately 17 people living with HIV per day.³⁰ In one NGO programme, clinical associates performed 1 500 voluntary male medical circumcisions (VMMCs) per month at 16 sites in four provinces.³⁰ Findings from a 2018 study of clinical associates in three clinics and two hospitals in the Tshwane Metropolitan area found that they had performed 88.7% of 4 850 circumcisions from January 2014 to April 2015.²⁹

Table 2: Estimated number of clinical associates needed in the South African healthcare service to achieve UHC by 2030

Facility	Facilities / entities (no.)	Clinical associates (average per facility)	Total no. of clinical associates (nationwide)
VMMC units	250	3	750
NHI-contracted general practitioners	2 000	1	2 000
WBPHCOTs	4 200	1	4 200
CHCs	250	6	1 500
District hospitals (very small: <50 beds)	24	6	144
District hospitals (small: 50 - 150 beds)	101	10	1 010
District hospitals (medium: 150 - 300 beds)	78	15	1 170
District hospitals (large: 300 - 600 beds)	20	20	400
Training hospitals (not district hospitals)	10	20	200
Academia	8	12	96
Total			11 470

Source: Capati, et al.; 2017.¹¹

CHCs = community health centres; NHI = National Health Insurance; VMMC = voluntary male medical circumcision; WBPHCOTs = ward-based primary health care outreach teams.

Through task shifting, and with a good referral system and access to medical practitioners, these cadres can perform the majority of clinical tasks efficiently.³¹ A recent study of physician assistants/associates similar to clinical associates in several African countries documented increased access to services, cost benefits, and physician-equivalent quality of patient care.³² This was also documented by the World Health Organization: “The existing evidence suggests that where mid-level cadres received appropriate support and adequate training, their performance is close to or even better than that of their professional counterparts”.¹³

Reducing costs

The cost of training a clinical associate is less than half that of training a doctor.^{24,26} Their education is complete in three years compared with the seven or eight years for doctors, including internship. Therefore, clinical associate training can

scale up more easily, and in less time, than training of doctors. In addition to reduced training costs, clinical associate employment provides cost savings for human resource budgets. At current salaries, the NDoH can employ 2.4 clinical associates for the cost of one medical practitioner,²⁴ and the health service can employ a team of 18 clinicians (six doctors and 12 clinical associates) on the same budget required to employ 11 doctors (Figure 2).

In practice, filling vacancies is more practical than changing the cadres employed. Where an organogram allows for five doctors, two vacancies can be converted to four clinical associate posts to create a more efficient team of seven clinicians at no cost increase. A 2016 study found that including clinical associates in clinical teams can result in human resource cost savings of between 7% and 21%.²⁴

Figure 1: Work profile of doctors before and after addition of clinical associates

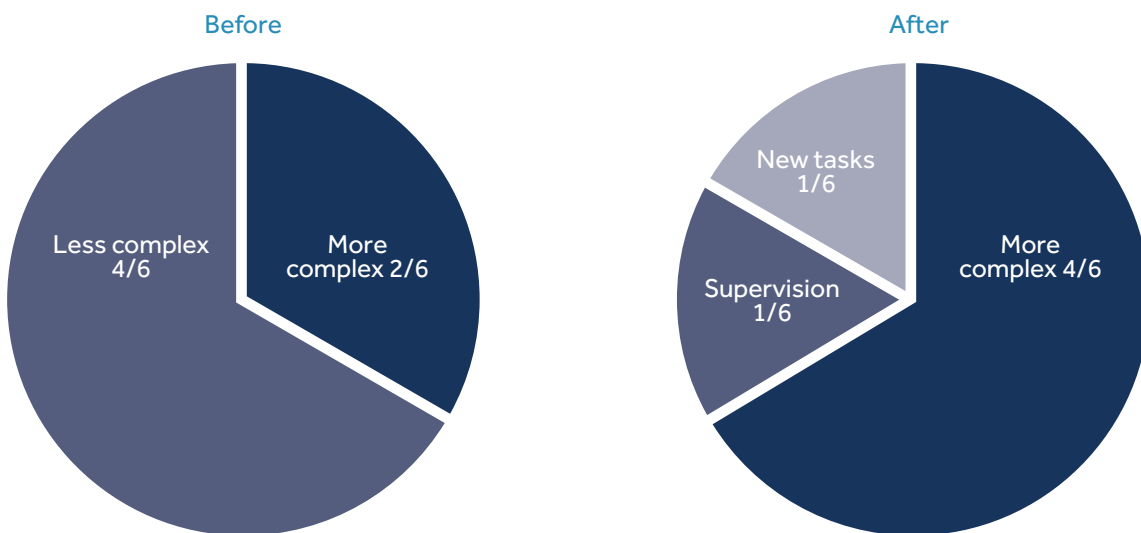
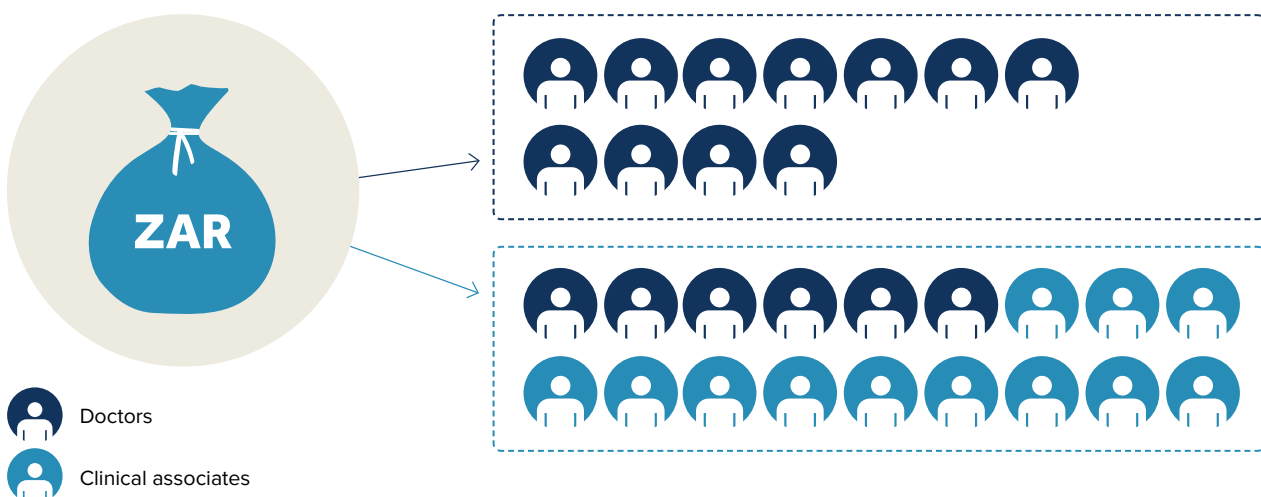


Figure 2: Comparison of the composition of two healthcare teams employed with the same HR budget



Effectiveness and quality of care

An effective health system is one that meets the targets set for different measures of performance. Delivering high-quality care is a cross-cutting objective for any health system but coupling this with effectiveness allows for qualitative and quantitative outcomes to be improved together as a combined target.²³

Clinical associates are not meant to replace doctors or nurses, but to enhance the ability of healthcare teams to provide quality care.²⁷ A 2013 literature review found that mid-level workers can provide the same quality of care as higher-level workers provided that they receive adequate training, support and supervision within the team.³³

Effective teams allow for sharing of tasks with clinical associates and/or shifting of tasks towards them, which lightens the workload of medical practitioners and nurses, thereby increasing productivity, quality and quantity of care. Several facilities have reported shorter queues at outpatient departments and other areas since the introduction of clinical associates.²⁶ These results are similar to findings in the USA of increased patient access with the addition of physician assistants.³⁴ In the Tshwane study on VMMC, the incidence of complications did not differ between the 88.7% of circumcisions performed by clinical associates and the 11.3% done by medical practitioners.²⁹

Scope of practice

The clinical associate scope of practice promotes effective teams, with guidelines for supervision of the clinical associate by a medical practitioner, relative to the years of consecutive clinical practice.¹⁹ However, the specific wording in the scope of practice does not enable the appropriate supervision

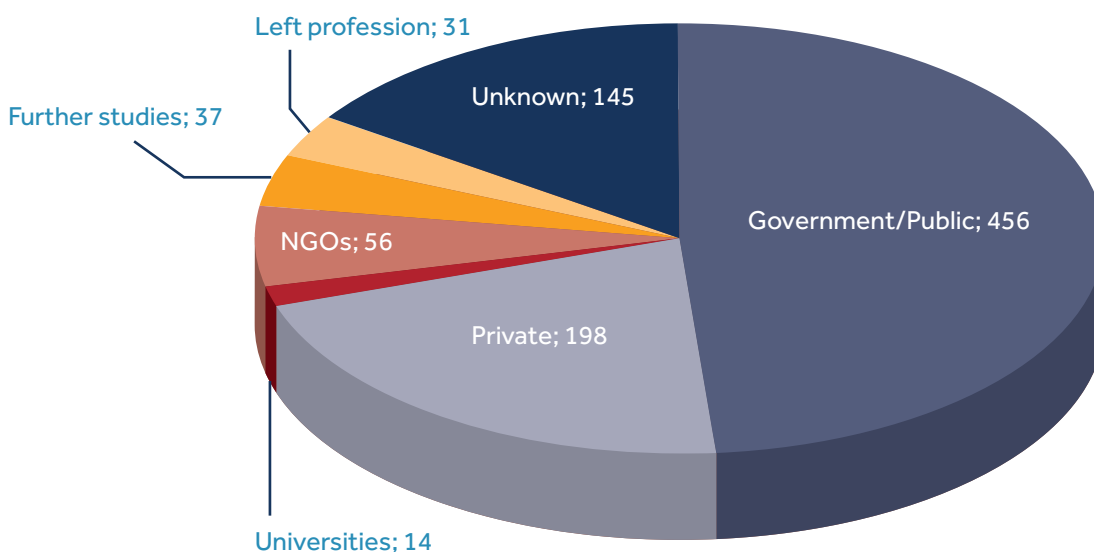
needed for team members to be effective. For example, the distinction between the level of supervision required at 0 - 2 years ("continuous and hands-on") versus at 2 - 4 years ("report in person after each task") is open to interpretation. Additionally, this can lead to micro-management of clinical associates, which reduces their effectiveness. While intending to limit medico-legal risks, this lessens the potential of the team-based approach. Creating a team-based, collaborative working environment should allow for an optimal balance between direct and indirect supervision, in which the risks are managed dependent on the complexity of the task(s) and the competence of the clinical associate.

An example of an effective role that clinical associates play within a multi-disciplinary team can be found in the Community Oriented Substance Use Programme (COSUP), implemented in Tshwane from 2016. Together, social workers, community health workers, and clinical associates form teams at 15 sites in four sub-districts. Under the supervision of medical doctors, the clinical associates within the teams provide comprehensive interventions to more than 4 000 people. They are responsible for clinical care, including care of 800 people on opioid substitution therapy.^{35,36}

Prescribing

The ability of clinical associates to prescribe medication at the PHC level of the Essential Medicines List (EML) up to Schedule IV, with prescriptions of a higher Schedule permitted in management of emergencies,¹⁹ has enhanced team effectiveness. The prescription only requires the name of the supervising medical practitioner, not a countersignature. In the case of exceptions to this rule, namely drugs outside the EML, a countersignature is required.¹⁹ This guideline increases team effectiveness and

Figure 3: Employment distribution of 937 clinical associates, South Africa, 2010 - 2017



Source: PACASA, AIHA, 2018.¹⁷

allows workloads to be shared appropriately. However, clinical associates are not yet regulated as authorised prescribers under the Medicines and Related Substances Act (Act No. 101 of 1965),³⁷ which severely hampers the productivity of healthcare teams.

Equity and access

Addressing shortage of staff

Most clinical associates work in the public sector in underserved and rural areas. A 2015 survey of employed clinical associates found that 64% of 92 respondents worked in rural areas.¹⁷ Students are mainly recruited from rural areas, with 60% of clinical associate students at one university reporting in 2014 that they preferred working in rural areas.³⁸ This preference was associated with having lived in rural areas for most of their lives. Adjusting for bursary or family obligations, this figure was 53.4%.³⁸ These findings contrast significantly with findings for final-year medical students, of whom only 4.8% were interested in working in rural areas beyond training and bursary obligations.³⁹

The private sector

There has been significant growth in clinical associate employment in the private healthcare sector, increasing from 2% of graduates in 2015 to 21% in 2018 (Figure 3).¹⁷ In this context, clinical associates are involved in fields like addiction care, clinical training, emergency medicine, surgical assistance and health systems consulting, among others. This has sparked some controversy as the clinical

associate training programme is intended to prepare students for public service and not the private sector. The increase in number of clinical associates in the private sector can be attributed to the failure of provinces to continue student bursaries and failure to create enough public health sector posts for clinical associates.¹¹

Conclusions

The intention of NHI is to catalyse South Africa's move towards UHC by ensuring equitable access to quality health services. An HRH strategy using clinical associates efficiently to meet targets of quality and performance can assist in achieving this objective. Evidence on the role and performance of clinical associates supports their increased employment in team-based contexts,^{10,15,24-27} particularly where inter-professional practices are properly implemented.

With appropriate supervision and management, and enough posts and career opportunities, the clinical associate profession could contribute significantly to quality healthcare delivery while providing employment for young South Africans. Utilising clinical associates will help to ensure that NHI implementation is consistent with the global vision that health care should be a social investment, and reflect a society based on justice, fairness and social solidarity.

Table 3: Proposed career path for clinical associates in South Africa

Name of post/rank	Requirements	Function
Clinical associate (first level)	1. BCMP or equivalent degree (BMCP at Walter Sisulu University) and 2. Registration as clinical associate with the HPCSA	Perform duties according to education and training. Have a high level of supervision and mentorship by a registered medical practitioner. (Regulations require direct supervision for 0 - 2 years' experience)
Senior clinical associate (second level)	1 and 2 and 3. Relevant postgraduate diploma or Honours degree with at least three or more years' appropriate experience as clinical associate at first level or 4. At least five years' continuous and appropriate experience as clinical associate at first level	Less supervision and can perform his/her duties efficiently without consuming the time of supervising medical practitioners, unless necessary. (Regulations require indirect supervision for 2- 4 years' experience, with collaborative supervision for 5+ years' experience)
Principal clinical associate (third level)	1, 2 and 3 or 4 and 5. Relevant master's degree with a minimum of five years' appropriate and continuous experience as senior clinical associate or 6. At least 10 years' continuous and appropriate experience as a senior clinical associate	Requires minimal supervision, working in collaboration with a supervising doctor; can perform duties independently according to extended experience, further training and/or education. (Regulations require collaborative supervision for 5+ years' experience)

Source: Capati, et al.; 2017.¹¹

Recommendations

- Strengthen the role of the Professional Association of Clinical Associates in South Africa (PACASA): While the nascent organisation is composed of energetic young clinical associate graduates, it will also benefit from increased skills capacity and guidance from professional partners to increase the advocacy, professional standing and visibility of the profession. Strengthened professional identity will increase morale along with the value-add of the profession.
- Review the Clinical Associate Scope of Practice and Prescription regulations:¹⁹ With 10 years of practical experience to draw on, it is imperative that the Scope articulates clear guidelines on role, supervision and effective task sharing. Prescribing rights, defined in the Scope, need to be ratified legally.
- Increase employment numbers/posts for clinical associates: Implement the guidelines as recommended by the Task Team for estimated number of clinical associates needed in the South African healthcare service to achieve UHC by 2030.
- Develop a human resources strategy for efficient and effective functioning of healthcare teams incorporating clinical associates: Competencies such as teamwork and role clarification are gaining traction in curriculum development and clinical practice, often within domains such as collaborative leadership and patient/family-centred care.^{40,41} As an example, clinical associates could be placed in teams with doctors during the latter's internship and/or community service, thus providing mutual support. Supervision of both can therefore be done efficiently, especially considering that interns rotate frequently, and the more constant presence of clinical associates would provide more team stability.
- Conduct job re-evaluation and re-grading for clinical associates in the public sector: The post of clinical associates in the public service was set at salary grade seven in 2010. However, the finalised scope and practical implementation of their role necessitates a review. The demands, complexity and responsibility of the job are now better articulated and understood, thereby supporting a review as per Section 39(1) of the Public Service Regulation of 2016.⁴² A review of responsibilities and salary will acknowledge the contribution of clinical associates while still maintaining cost efficiencies.¹¹
- Implement an attractive professional career path: In line with regulations defining scope of practice, it is recommended that clinical associates be recognised within three different career levels, each with its appropriate remuneration. They would be able to advance on a proposed career path from entry level to principal clinical associate. Job descriptions will change with additional responsibility for tasks and skills as they proceed up the ranks, according to further education, training and experience¹¹ (Table 3).
- Increase training of clinical associates: Universities with health science training platforms are encouraged to develop clinical associate programmes along with Honours courses/postgraduate diplomas in priority areas of medicine. This follows the BCMP Honours degree in emergency medicine offered by Wits since 2017.

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My experiences in health science education and research: a community worker's autoethnographic account

Authors

Judith Nomthandazo Mahlanguⁱ
Helga Elke Listerⁱⁱ
Michelle Nedine Schorn Janse
van Rensburgⁱⁱⁱ

It is essential that strong and mutually beneficial relationships be built among academics, researchers, students, and community liaison officers. Fundamental to this is the importance of a sincere and high regard for the often-invisible role of these community workers, and recognition of the importance of their contribution.

Community liaison officers are a crucial link between universities and communities and they play an important role in health science student training and research processes. Strong and mutually beneficial relationships among academics, researchers, students, and community workers are essential for successful partnerships. Fundamental to this is the importance of a sincere and high regard for community liaisons, who are often 'invisible', and recognition of the importance of their contribution.

While university departments have engaged more actively with communities in recent years, common preventable mistakes are still being repeated, impacting relationships with communities and the sustainability of interventions and research.

Using an autoethnographic research approach, this chapter reflects on the challenges, lessons and experiences of a community worker living and working in the community. These reflections are based on work as a community liaison for health science students participating in academic service learning in a semi-rural community, and on involvement in community-based health research in partnership with various universities. The chapter describes the challenges of university-community partnerships in the context of university teaching and research requirements and the effects of these challenges on students and community members. Recommendations are presented for decolonised and sustainable community engagement in health science education and research in the South African context.

i Community liaison officer; Student in Development Studies, School of Social Sciences, North-West University
ii Department of Occupational Therapy, School of Health Care Sciences, University of Pretoria
iii Department of Family Medicine, School of Medicine, University of Pretoria

Introduction

The current emphasis on universal health coverage, interprofessional education and collaborative practice provides an opportunity to reflect on the various interactions between academic institutions and communities. Such reflection is especially relevant given the provision for decentralised or distributed health sciences training at South African universities. Decentralised training has been defined as “training of students outside the central academic hospitals, in district and other appropriate healthcare facilities embedded in the community, in which the students are immersed in the experience of social determinants of health, in understanding the continuum of comprehensive care and the role of context in health and illness, and in addressing the maldistribution of human resources for health”.¹

While the principles of community engagement² are well-established at universities, these principles are not always translated into practice, and although university-community engagements are becoming more common, many things could be done to improve the quality, sustainability and value of these interventions.

South Africans often respond to social issues by joining civil society organisations (such as home-based care or support for vulnerable children), mostly without any remuneration. The essential role of a community worker³ involves linking various stakeholders through providing and maintaining communication between different sectors.³ As such, community workers serve as a bridge between institutions (such as universities) and the organisations, households, and individuals within a community setting.

The intention of this chapter is to share my experience as a community worker based on several years of work in a non-governmental organisation (NGO), and as a community liaison⁴ and research assistant with academic partners in the community, while living in the community at the same time. Through this, I have developed valuable insight into university and community partnerships.

Methods

Personal narratives were used in this retrospective⁴ and evocative⁵ autoethnographic study. Autoethnography is a qualitative research method that connects the personal and the cultural.⁶ Evocative autoethnography allows readers to connect with the feelings and experiences of a researcher through the researcher’s introspection on a particular topic.⁵ In personal narratives, authors write candidly about their academic, research and personal lives.⁷

I started journaling in 2008 when I became interested in writing and research. In 2015, I shared my desire to tell my story with my co-authors, and we considered the appropriate platform to disseminate the information. At the end of 2018, I responded to the SAHR Healthcare Workers’ Writing Programme (HWWP), which offers writing skills training and coaching through the publication process for identified first-time authors. Acceptance into this programme encouraged me to continue writing (journaling), and this became the data for analysis.

To ensure that the study was trustworthy, we used the criteria proposed by Le Roux⁷ for autoethnographic research. Criteria include showing evidence of subjectivity and authenticity, achieving resonance with the audience, and informing and hopefully inspiring ongoing research that improves practice and contributes to social change.

I have assumed that most readers of this chapter are different from me in terms of experience, type of employment, qualification and position. Therefore, I hope, as Ellis⁸ suggests, that reading this will help you to communicate with others who are different from yourself (especially community workers on the ground) and that you will relate to my experience. I have described events as accurately as I remember them and engaged in conversations with my co-authors about my writing to obtain greater reflexivity.

Throughout this process, we made sure that my original words were used. The main data are my written and verbal reflections on my work as a community worker and community liaison, which were analysed thematically. The first level of analysis involved the co-authors and myself reading through and discussing my reflections, after which we each separately identified codes. At the second level we came together again to identify common themes from the codes. The third level involved deeper analysis as we proceeded with further introspection and reflection. Finally, we linked my experiences to the literature.

From an ethical perspective, we followed the advice of O’Hara⁹ who recommends following the standards of the Belmont Report when review by an internal review board is not possible; these standards advocate for respect for all persons, beneficence, and justice.¹⁰ We also considered the ethics associated with autoethnography set out by Lapadat.¹¹ Firstly, from a relational ethics point of view, we have taken care not to blame or cast anyone in a negative light and have intentionally written this chapter to encourage growth and offer lessons for the future. However, to make sure of this, I asked those who have been part of this journey to read the chapter prior to submission and provide their input and consent. Secondly, I have been openly vulnerable, and have experienced the therapeutic benefits of writing these personal narratives. But it has been a stressful experience, since this is my first time writing for a peer-reviewed

- a Community worker refers to someone (usually a community member) who works for an organisation in the community. This is distinct from a community health worker (CHW), who offers a health-promotion and disease-prevention and management service to households.
- b In this chapter, community liaison officer refers specifically to a community worker who works for a university to support students with community engagement.

publication and I feel pressure regarding the outcome and what others will think – both readers and community workers. Thirdly, I have not been intentionally provocative, but do feel compelled to bring awareness to the challenges that exist when training students in interprofessional and collaborative practice or doing research in communities they may not be familiar with. Certain experiences I have had have been painful. However, Denzin¹² agrees that it is necessary to make “visible the oppressive structures of a culture” (in this case, the culture of community engagement and research) and Lapadat¹¹ affirms that this will “point a way towards more socially just possibilities”. My only goal is to create awareness and explore a better way forward.

Reflections on my journey

My personal upbringing is filled with examples of my grandmother caring for people in need, and I always remember extended family staying with us in our home. I heard the African Proverb, *umuntu ngumuntu ngabantu*, which means ‘a person is a person through other people’, almost every day of my life.

Because of this influence, in 2004 I volunteered as a caregiver at a centre for needy and vulnerable children in a semi-rural community, north of Pretoria. When I arrived at the centre, I was the only young person working with other older volunteers. My job involved doing home visits, usually walking two to five kilometres to visit households of people living with HIV and AIDS and their affected families. I organised identity documents and social grants for those who needed them and helped to get children registered and back to school. Sometimes cases were unusual, for example I organised a funeral for an old lady who was caring for her 15 grandchildren (their parents had died of AIDS). She did not have funeral cover, so I arranged with the local municipality and fundraised for the remaining funeral costs. I managed to reunite a Mozambican man with his family as he was sick with HIV and had no one to care for him. Unfortunately, he died a week after the reunion. The child of a mentally ill patient burnt their house to ashes, so I took care of the child and his siblings at the centre while their mother left to be with her boyfriend 20 km away. I would put my son to bed at night, leave him in the care of my mother, and walk a kilometre to sleep with the children at the centre so that they would be safe.

As volunteers we were not paid, and I worked 12 months with no salary or stipend. My payment was the difference I made in the lives of others. I grew and learned a lot from being a caregiver at this centre, and always felt rewarded by the end results. I learnt patience, love and perseverance, and that helping to improve someone’s life is invaluable. In 2005, the centre received funding and I began receiving a stipend of R100 (approximately US\$6.8) per month. I started to assist with fundraising for the organisation, such that half

my time was caregiving and the other half was marketing the project.

One day, as I was walking to do home visits, I met two fourth-year occupational therapy (OT) students doing their academic service-learning fieldwork in my community. I was interested to hear more about what they were doing, so we exchanged numbers, and I later contacted their lecturer, explained what we did and invited the students to do their fieldwork at the centre. In 2005, the OT students started working with us. My interest in their work grew, and as I connected with the students, they began to share the challenges they were experiencing while working in the community. With matric and no training, I became a source of support, offering my time to help them with their planning. I looked at their projects and interventions and taught them about community culture and how they could approach the community. This input was recognised by the students’ lecturer, and more students began attending my sessions.

When the occupational therapy technician (OTT) who supported students in their community fieldwork resigned, the lecturer supervising the students asked if I would be willing to extend my services by working part-time for the university’s OT Department. Because I did not have any tertiary qualifications, the university was not sure how to appoint me. Thus, I worked with the OT Department for six months without being officially appointed, while the Department motivated for my appointment. In 2006 I was finally appointed by the university as a ‘community liaison’. My duties were to facilitate connections and relationships between the OT Department and community organisations, to find clients requiring OT intervention in households so that OT students could do home visits, to do translation for students where necessary, and to do follow-up visits to community partners to determine the efficacy of the students’ work. Knowing the challenges of community engagement, I used my skills to educate students about the community, and I organised cultural events where they could have fun, enjoy local food and experience the culture of the community. Students learned a lot and began to see themselves as part of the community.

Being a community liaison improved my communication skills. Opportunities arose for me to connect to research projects, and I joined a national, multi-site research project, which opened further opportunities for me. I became an independent research coordinator, a research fieldworker, and data collector, which also improved my academic writing. I found myself part of a team of different cultures, coming together in the spirit of *ubuntu* with the shared goal of community development. We got on well and being in the team motivated me to further my studies. Because of my connections with several researchers and academics, I developed networks with other universities in South Africa, and got an opportunity to travel overseas to present research results.

Unfortunately, in 2010, the university authorities suddenly terminated all academic service-learning programmes in my community in order to focus on a peri-urban site closer to the university. The OT lecturer and I received the news two weeks before the beginning of the new service-learning period. Although the Faculty of Health Sciences tried to convince the university management to remain in the semi-rural area, as there had been over 20 years of investment in my community, the decision was not reversed. This changed my life. I felt humiliated and dehumanised by the institution, and lost my income, which took away the opportunity to build my academic skills (at the time I was registered with a distance-based university as a part-time student for a degree in Development Studies). The situation negatively affected my life and that of my then-11-year-old son and we were faced with big adaptations.

In the years that followed I worked for two NGOs in two different peri-urban communities and opted to move to those communities in order to understand them better. I also tried to continue with my part-time studies, but this remained challenging due to financial constraints. I stayed in contact with the OT lecturers I had gotten to know, and because of those connections, I became a research assistant on several research projects. Most recently, I worked with a PhD student on food security for HIV-positive women with disabilities. In 2018, I presented a poster on my experiences as a community worker at an academic conference, and in 2019 I facilitated a panel discussion with community workers at an academic conference on the theme 'hearing community worker voices and experiences'. From these connections came the opportunity to be awarded a bursary by the Bigen Africa Group to do a degree in Development Studies at North West University on a full-time basis, which I am currently busy with as a first-year student.

Key findings

The main themes identified following analysis were: qualities of a community worker; the value of a community liaison person; personal growth and skills development; and partnerships, power, and privilege. These are discussed in detail below.

Qualities of a community worker

An essential characteristic of a community worker is a sense of humanity, or in other words, *ubuntu*. A genuine concern for people in the community and deep compassion for them has been the driving force behind my work. Being passionate about people and recognising their needs has often made me go beyond the extra mile for them. While working with the PhD researcher, there was a time when due to injury she could not walk or drive. I travelled by taxi to her home, drove her in her car to the research site, later took her back to her home, and then took public transport

to my house. It was important to me that the research outcomes be achieved, and the extra effort was worth it. Placing community first has always been non-negotiable.

Value of a community liaison officer

I have seen how important it is to have a community liaison person in partnership between community members and those from outside. Initially I did not have a defined set of tasks, but my role and relationships developed over time as I became a link between the OT Department and the community. My value lay in being a reliable and important support system for the students. I assisted with developing cultural sensitivity and understanding, monitoring project implementation, and helping to overcome language barriers. This was especially important as lecturers were often not able to be with students full-time in the community during fieldwork. In addition, NGO staff often had a large workload and could not take on the extra work of supporting students. As community liaison, I was able to lighten the workload of lecturers and community workers.

It is important to partner with a community liaison who understands the community culture well, and who is able to bridge the communication and knowledge gaps.¹³ There are significant cultural dynamics in communities, for example in my community it is believed that disability is caused by bad blood and a razor blade is used to draw blood from affected areas, for instance in children with cerebral palsy. I also saw that some student interventions were not culturally appropriate, such as ironing and cooking activities for older black male clients, as these are not things they typically do. I made sure that students used acceptable strategies to approach families, and that they were able to use the right words and be culturally appropriate. An example of this is given in Box 1.

Personal growth and skills development

Being a community worker has empowered me and I have experienced personal growth, developed critical thinking skills, and found my purpose. Qualities I have developed include patience, love, perseverance, and adaptability, and my communication, marketing, leadership and academic-writing skills have all grown. Being part of projects gave me the opportunity to learn how to design and conduct research. This in turn made me recognise the importance of writing, especially in observing and communicating community needs. When a research project leader believed in me as the community worker facilitating a project, it gave me confidence. My presentation skills developed as I disseminated research outcomes, which empowered me to be able to speak publicly and to stand up for my rights. Being part of research teams has opened opportunities for me. My interest keeps growing, I ask questions and want to learn, and researchers and students learn from me, all of which encourages me to want to uplift my community further.

Partnerships, power, and privilege

I have observed the benefits of positive partnerships and the value of good relationships. Long-lasting friendships were built with some lecturers and researchers over years, and once I became a visible research team member, I felt the regard we had for each other, which was wonderful. Equality between academics and community workers needs to be upheld, as each brings a diverse range of skills and abilities.¹³ Greater learning and improved outcomes occur when all team members are included and see themselves as part of the community.

I have noticed that exchange of services, namely university students getting experience and community members receiving free care services, has great impact in the community. Because I saw how beneficial the students' work was, I was concerned that if students were not satisfied (or not meeting the expectations of the university degree requirements) we might lose them. It was for this reason that I went in depth with them, to help ensure that their programmes continued and succeeded.

One of the biggest threats to partnerships is not understanding where the other person is coming from. As I connected with the students, they shared their challenges in the community, such as losing clients, some clients not liking the services offered, and some clients not wanting to see students after a certain number of sessions. Community members pride themselves on their culture and traditions, and if someone approaches them inappropriately it is likely that they will withdraw from the partnership.

Another challenge was mismatched expectations. Students must comply with certain training requirements; however, academic outcomes and community expectations do not always correspond. Students need to attend to both

aspects, which often leads to overwhelm and affects learning. As such I felt concern about students burning out due to workload; choosing inappropriate community projects; failing to adapt; experiencing culture shock; and becoming confused about where to start in the community.

For me, lack of finances was not just an obstacle but a great barrier to my involvement in partnerships. I understood that I could only get paid at the end of the fieldwork period (seven weeks), but there would then be a delay in payment, and I would have to borrow money so that I could meet the students at the beginning of the next fieldwork. I could not expect the students to fetch me from my home initially because they did not yet know the community.

Once we were involved in a car accident while driving to one of the homes. Because I did not have medical insurance, I lay on the roadside for almost two hours waiting for an ambulance. I did not receive professional counselling, which would have helped me deal with the trauma. While the Department tried its best to help me, the incident raised the question for me: 'How should an institution take care of its community engagement partners when there is a crisis?'

I have also reflected on how community workers could be integrated more fully into their teams. For example, I was not invited to the farewell function of one of my colleagues. I thought this may have been because I was 'just a community worker'. Leon et al.¹⁴ talk about 'the invisible worker', and this is how I felt. It reminded me of the situation described earlier when the university terminated academic service-learning programmes and I felt powerless for my voice to be heard.

Something that has been difficult for me has been working part-time for the university for almost five years but receiving no benefits and no opportunities to be appointed full-time.

Box 1: Mina's story

Mina (not her real name) was a 15-year-old learner with epilepsy and cognitive deficit. She attended a mainstream primary school but was still in Grade 5, with learners four to five years younger than herself. There were no other suitable placement options for her as family members worked during the day.

This affected Mina emotionally. For example, she had a seizure during her menstrual period and some learners made fun of her. This demotivated her so that she did not want to proceed with her schooling.

Although she was on epilepsy medication, her family had certain beliefs regarding her condition, such as that becoming pregnant and having a baby would improve her condition.

Mina was introduced to final-year OT students during their home visits. They provided OT intervention, including rehabilitation and education on Mina's condition, and she became more independent and positive about life.

Throughout this journey I ensured that students used suitable strategies to approach the family, used the right words, and were culturally appropriate.

Together with her parents, the students assisted Mina over time, and she was later placed at a youth vocational centre. Her independence in being able to travel to and from work, socialising with her peers, and being able to contribute financially to her family has built her confidence.

Recommendations

It is true that community workers and other frontline workers (such as community health workers) are now increasingly accepted as essential team members in health systems. University staff and researchers should also ensure that community workers are equal partners and that good relationships are fostered between them. Community engagement not only improves student learning and comprehension, it also impacts the wellbeing of community members. It is necessary to continue learning from community-oriented partnerships so that our work together can grow from strength to strength.

Going forward, I recommend the following:

- Where projects have failed in the past or there have been negative outcomes, we need to go back and determine what went wrong and what could have been improved. Learning from our mistakes will motivate and sustain the community, assist project leaders, and facilitate change where possible.
- Universities should use an action learning cycle approach¹⁵ with their students, which includes journaling as a means of reflective learning. This will help to ensure that projects are relevant, and that institutions are conscious of where they need to change in terms of power and privilege.
- Employment of community liaison officers in health science education and research should be based partly on the candidates' skills and qualities, and not solely on their credentials. This will allow someone like myself with 'just a matric' to be easily appointable by a university.
- When community workers are employed, it should be borne in mind that they may not have any other source of income. It may therefore be difficult for them to fulfil certain requirements (such as taking public transport to get to a specific site). It will help if a down-payment or stipend is given at the beginning of the partnership so that they can participate fully.
- It is important for community workers to be empowered. However, they are often not provided with accredited certificates for their training, or trainers come from outside the community and leave after the basic training, which impacts on community relationships and thus sustainability. It would be ideal if universities could help community liaison officers get an accredited qualification.
- Before a project commences, community liaisons should be informed about the process, including time frames, finances, and who is going to be involved.
- The perspective of community workers should be included when planning community engagement curricula.

Conclusion

Having shared my story, I feel vulnerable. I know that it is worth it since I am giving a voice to many who have come before me, to those who are with me now, and to those who will do this work in future. I have summarised the key qualities of a community worker and the value that a community liaison brings, shown how my personal life and work skills have developed doing this work, and discussed issues around partnerships, power, and privilege. I acknowledge the challenges that exist in finding solutions, especially regarding the economic concerns highlighted. However, I believe that others can learn from my experience, and trust that we can discuss the recommendations made here and lay out clear plans to improve community engagement.

Community workers are key in health science student training and research processes. It is essential that strong and mutually beneficial relationships be built among academics, researchers, students, and community workers. Fundamental to this is the importance of a sincere and high regard for the often-invisible community liaisons, and recognition of the importance of their contribution. If this is done, health science education and research, and the communities served, will benefit from the reciprocity that comes from these valuable, collaborative partnerships.

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A review of health, HIV and TB resource allocation and utilisation in South Africa

2013/14 - 2020/21

Authors

Nhlanhla Ndlovuⁱ
Kavya Ghaiⁱⁱ
Nthabiseng Khozaⁱⁱⁱ
Michael Chaitkinⁱⁱ
Sithabiso Masuku^{iv}
Gesine Meyer-Rath^{iv,v}
Teresa Guthrieⁱⁱ

Timely and accurate data on spending trends are critical for policy, planning and programme management. Routine expenditure analysis can facilitate dialogue between national and sub-national actors to improve technical efficiency given the scarcity of public resources.

The South African Government, the United States (US) Government, and the Global Fund to Fight AIDS, Tuberculosis (TB) and Malaria each invest in health services in the country. Tracking resource allocation and utilisation is critical to understanding the extent of these investments.

This chapter shows trends in health, HIV and TB budgets (2013/14 - 2020/21) and expenditure (2013/14 - 2017/18) so as to inform the allocative efficiency and sustainability of the National Strategic Plan (NSP) for HIV, TB and sexually transmitted infections (STIs).

Budget and expenditure reviews were conducted to measure contributions from the South African Government and partners towards NSP objectives. Capacity was developed and built around an automated extraction tool for HIV and TB transactions in the public financial system. This tool was also used to consolidate available US Government and Global Fund data for 2014/15 through 2016/17, the three financial years following the last multi-year review of HIV and TB spending.

Government's health budget increased from R133.3 billion in 2013/14 to R205.4 billion in 2018/19 (12.3% of total budget), reflecting 2% real annual average growth. Within the health budget, the HIV and TB allocation increased at a real annual average rate of 7%, from R11 billion in 2013/14 to R20.7 billion in 2018/19. This may imply that HIV and TB are crowding out other health spending.

In 2016/17, the three largest contributors to HIV and TB spending were the South African Government (76%), the US Government (22%), and the Global Fund (3%). United States Government contributions increased from R4.2 billion in 2014/15 to R6 billion in 2016/17, although this amount may decrease in coming years. This analysis should inform the South African Government's efforts to mobilise additional resources for HIV and TB and to improve programme efficiency.

i Centre for Economic Governance and Accountability in Africa
ii Results for Development
iii South African National Department of Health
iv Wits Health Consortium
v School of Public Health, Boston University

Introduction

Analysis of health spending includes determining trends for source of funds; level of funds; geographical and programmatic distribution; and cost drivers; this helps policymakers assess whether resources are reaching priority populations, interventions, and hotspot geographies. Analysis also helps with identifying potential opportunities to improve allocative and technical efficiency, and it stimulates more productive dialogue at multiple levels of the changing system.

It is also important to understand financial performance against the backdrop of programme performance. South Africa's mother-to-child HIV transmission rates dropped from 8% in 2008 to 2% in 2015, and then further to 1.5% in 2016.¹ The country continues to mount the world's largest HIV treatment programme, with more than 4.5 million people on antiretroviral therapy (ART) by the end of June 2018.² Partially as a result of this, life expectancy increased from 59.7 years (males) and 65.9 years (females) in 2015, to 61.1 and 67.3 years in 2018.³ These achievements would not have been possible without the increasing political and financial commitment of the South African Government (SAG), combined with support from development partners.

Despite progress, annual new HIV infections were estimated at 270 000 in 2017, only a small reduction from the 280 000 reported in 2016. AIDS-related deaths increased^a from 100 000 in 2016 to 110 000 in 2017.² Moreover, South Africa has the sixth-highest tuberculosis (TB) incidence in the world, with more than 450 000 new cases diagnosed in 2015 (0.8% of the population), and increasing numbers of multi-drug-resistant cases.^{2,4} Tuberculosis remains a major cause of death⁵ and a major public health threat, albeit with declining proportions of TB-related deaths among total deaths (down from 8.3% in 2014 to 6.5% in 2016).⁶ Additionally, 60% of TB patients live with HIV, of whom 89% are on ART.⁷ Strategic interventions and resources are needed to prevent and control TB among people living with HIV (PLHIV) and the general population.

This chapter examines financing for health, HIV and TB. A review was done of SAG expenditure and budget trends from 2013/14 to 2020/21 as well as a dissection of SAG, United States (US) Government, and Global Fund expenditure from 2013/14 to 2016/17, with a special focus on provincial programme spending and performance. This work builds on, and in some cases draws directly from, previous analyses of health and HIV budgets and expenditure.⁸⁻¹¹

Data sources and methodology

Information on the macro-economic outlook came from the International Monetary Fund 2018 and 2019 World Economic Outlook Reports^{12,13} and the Statistics South Africa 2019 Quarterly Labour Force Survey.¹⁴ Data sources for the SAG health, HIV, and TB budgets included the National Treasury's 2017/18 - 2019/20 Estimates of National Expenditure,¹⁵⁻¹⁷ 2017/18 Estimates of Provincial Revenue and Expenditure,¹⁸ the 2018/19 Budget Speech,¹⁹ the 2018/19 Division of Revenue Act,²⁰ and the 2019/20 Budget Review.²¹ These sources record SAG spending during 2013/14 - 2017/18 and budget estimates for 2018/19 - 2020/21. More detailed multi-sectoral and programmatic analysis of HIV and TB expenditure during 2014/15 - 2016/17 was based on data from the SAG's centralised Basic Accounting System (BAS), provided by the National Department of Health (NDoH). The study used descriptive analysis techniques in Excel, supported by quarterly review meetings with provincial HIV and TB management teams to validate financial and non-financial reports from the analysis. United States Government expenditure data were extracted from the Expenditure Analysis database of the President's Emergency Plan for AIDS Relief (PEPFAR), with some clarifications provided by a United States Agency for International Development (USAID) South Africa official. The Global Fund data came from Principal Recipients' progress updates and disbursement requests.

All budget and expenditure figures were converted into real terms based on consumer price index (CPI) information, using 2017 as the base year (Table 1).

Concurrent with the analytical process, an automated tool called BASLY^b was developed and built to extract HIV and TB transactions from the SAG's Basic Accounting System (BAS), and capacity to use it was built within the national and provincial Departments of Health (DoHs). The NDoH and provincial DoHs are now using BASLY for their quarterly and annual reviews, with technical support from the Centre for Economic Governance and Accountability in Africa (CEGAA).

- a The increase in AIDS-related deaths was not explained in the cited report, and possible reasons are not postulated in this chapter.
- b BASLY is an Excel-based tool that automates several key steps of HIV and TB expenditure analysis. These include searching NDoH BAS records for every HIV- and TB-related transaction, extracting these into a common database, cross-walking the interventions and cost categories to reduced lists of common categories, and running detailed analyses on this dataset. The tool can analyse other expenditure data (such as from the US Government and Global Fund) along with the NDoH extract if they are arranged in the BAS output structure. The tool allows the government and partners to complete these steps in a few hours, compared with the weeks, or even months, previously required.

Key findings

South Africa's macro-economic outlook

During a period of global growth (3.7% in 2017 and 3.2% in 2018), South Africa's economy grew much more slowly (0.9% in 2017, 0.8% in 2018, and 0.9% (projected) in 2019),^{12,13} with increasing unemployment, from 26.7% in 2017 to 27.1% in 2018.¹⁴ Young people bear a disproportionate burden: among 15 - 34-year-olds, the unemployment rate reached 38.9% by the end of 2018. The budget deficit and debt-to-gross domestic product (GDP) ratio also continued to grow (Table 2).

In 2018, National Treasury attempted to reduce the budget deficit and debt by raising revenue through a value-added tax (VAT) increase from 14% to 15%,¹⁹ while boosting service delivery with additional allocations for the education sector following the announcement of fee-free higher education. Despite these fiscal pressures and broader macro-economic challenges, the analysis below shows how the SAG continues to intensify public spending on HIV and TB.

Analysis of total and health budget allocations (2013/14 - 2020/21)

Figure 1 shows trends for total budgets and health budgets across national and provincial spheres of government. Total allocations increased from R1.1 trillion in 2013/14 to R1.7 trillion in 2018/19, and are expected to reach R1.9 trillion in 2020/21, reflecting 2% real annual growth. Meanwhile, consolidated general health allocations increased by on average 3% annually in real terms, from R133 billion in 2013/14 to R192 billion in 2017/18, and are expected to exceed R240 billion in 2020/21. The medium-term expenditure framework (MTEF) for 2018/19 - 2020/21 allocates 12.3% of the total budget to health, short of the 2001 Abuja Declaration target of 15%, which African governments committed to.²³

Allocations to the NDoH for HIV and TB have grown by 7% annually, from R11.0 billion in 2013/14 to R18.3 billion in 2017/18, and are set to surpass R25 billion in 2020/21. As a share of the consolidated health budget, this corresponds to an increase from 8.3% in 2013/14 to 10.5% in 2020/21 (Figure 2). This growth is largely driven by continued

Table 1: Consumer price index information, South Africa, 2013 - 2020

Financial year	2013	2014	2015	2016	2017 Base year	2018	2019	2020
CPI fiscal year index	84.1333	89.2655	93.3717	99.2541	104.5146	110.0538	115.9967	122.3766
% CPI	0.058	0.061	0.046	0.063	0.053	0.053	0.054	0.055
Base year 2017	0.80499	0.85410	0.89338	0.9497	1	1.053	1.10986	1.17090

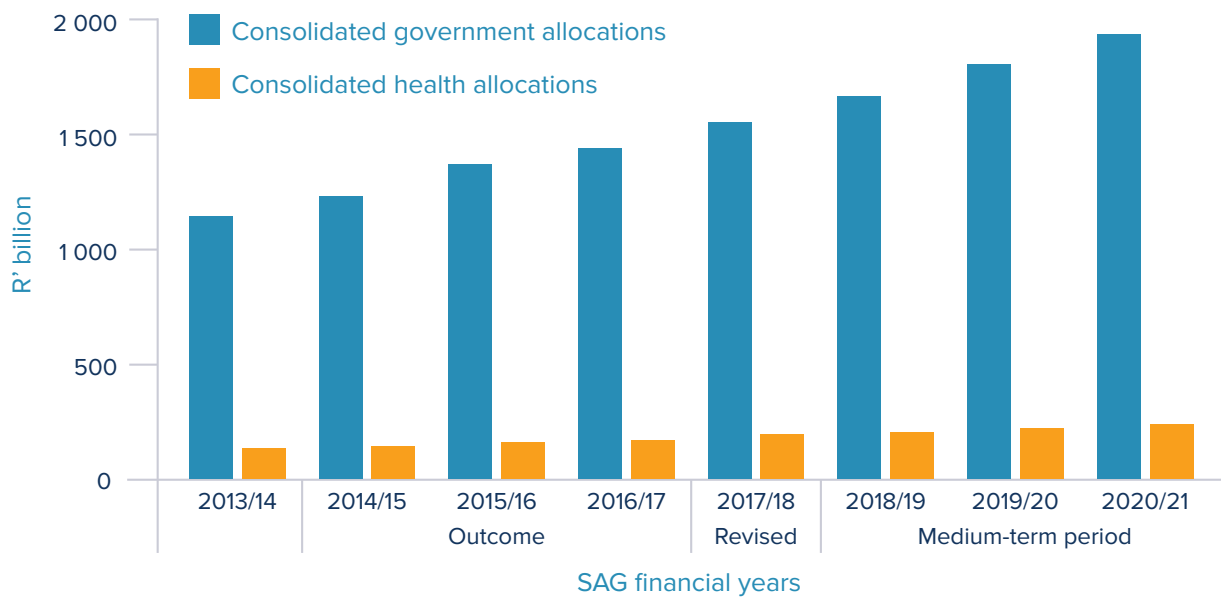
Source: National Treasury, 2018.²² (Authors' calculations.)
CPI = consumer price index.

Table 2: Budget deficit and debt-to-GDP ratio as a percentage of the consolidated fiscal framework, South Africa, 2014/15 - 2021/22

Year	Outcomes				Revised estimate	Medium-term forecast		
	2014/15	2015/16	2016/17	2017/18		2018/19	2019/20	2020/21
Budget deficit	3.6%	3.7%	3.6%	4.0%	4.2%	4.5%	4.3%	4.0%
Debt-to-GDP	46.5%	49.0%	50.7%	53.3%	55.6%	56.2%	57.8%	58.9%

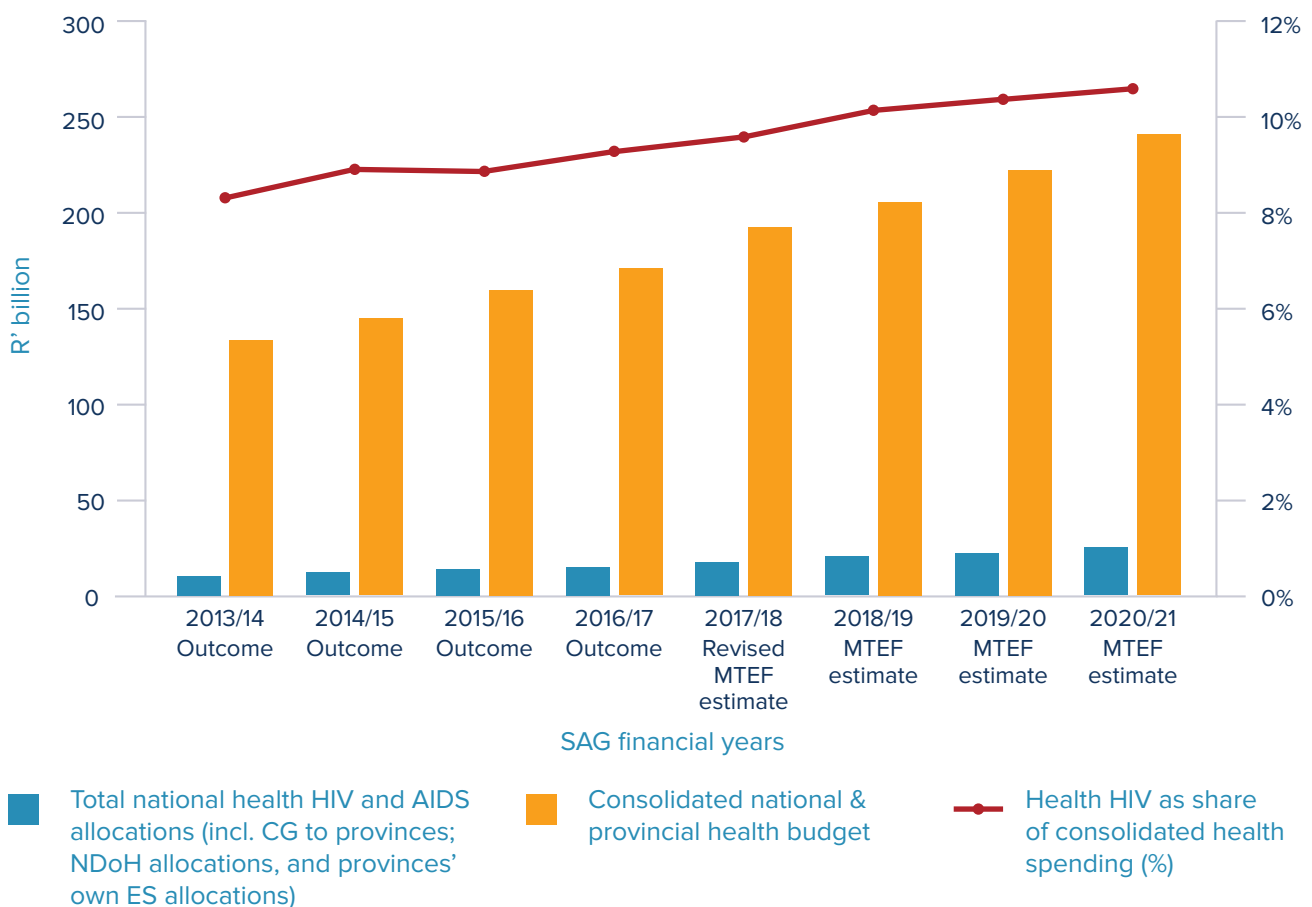
Source: National Treasury, 2019.²¹ (Authors' calculations.)
GDP = gross domestic product.

Figure 1: Consolidated government and health expenditure for 2013/14 - 2017/18 and budget estimates for 2018/19 - 2020/21, South Africa (R' billion, nominal)



Source: National Treasury, 2019.²¹(Authors' calculations.)
SAG = South African Government.

Figure 2: Consolidated health and HIV budget allocations for 2013/14 - 2020/21, South Africa (R' billion, nominal)



Sources: National Treasury, 2018;¹⁶ National Treasury, 2018.¹⁹ (Authors' calculations.)

CG = Conditional Grant; ES = equitable share; MTEF = medium-term expenditure framework; NDoH = National Department of Health; SAG = South African Government.

expansion of the ART sub-programme to meet the UNAIDS (Joint United Nations Programme on HIV/AIDS) 90-90-90 targets by 2020/21.²⁴ Notably, a portion of health-sector spending on HIV is embedded in general primary healthcare (PHC) spending, such as salaries of nurses providing HIV alongside other PHC services, which cannot be easily quantified and attributed to HIV. Moreover, only NDoH spending is shown in Figure 2, although other departments also make important contributions to the HIV response.

The Comprehensive HIV and AIDS Conditional Grant has always accounted for more than 90% of the health-HIV budget allocations, with the remainder coming from the NDoH budget and provinces' own voted funds, which have tended to fluctuate (Table 3). Since 2017/18, the grant incorporated additional funds for TB, and subsequently R4.4 billion was added for a new community health services component,^c which aims "to help provinces standardise the work of primary healthcare outreach teams and integrate them into the national health system."²²

Among the provinces, KwaZulu-Natal has always received the highest proportion of health HIV and TB funding (26.9% in 2018/19), followed by Gauteng (22% in 2018/19), and the

Eastern Cape (11.3% in 2018/19), while the Northern Cape continues to receive the smallest share (2.3% in 2018/19) (Figure 3). Proportional allocations of the HIV and TB conditional grants across provinces have remained mostly constant over time, determined by the NDoH's allocation formula.^d

Multi-sectoral and programmatic analysis of HIV and TB expenditure for 2014/15 - 2016/17

A multi-sectoral HIV and TB expenditure review was conducted of the BAS records together with US Government and Global Fund sources for 2014/15 through 2016/17,^e including the first-ever district-level analysis^f of HIV and TB spending.¹¹ Public TB spending in this section includes both the conditional grant and voted funds labelled as TB-related.⁹ In addition, this section includes the public spending on HIV by the Department of Social Development (DSD) and the Department of Basic Education (DBE), while the budget section did not include this.

Combined spending on HIV and TB increased from R22.5 billion in 2014/15 to R28.8 billion in 2016/17 (Figure 4, left panel), reflecting an average annual growth of 13% over the three years. By 2016/17, the SAG accounted for 76%

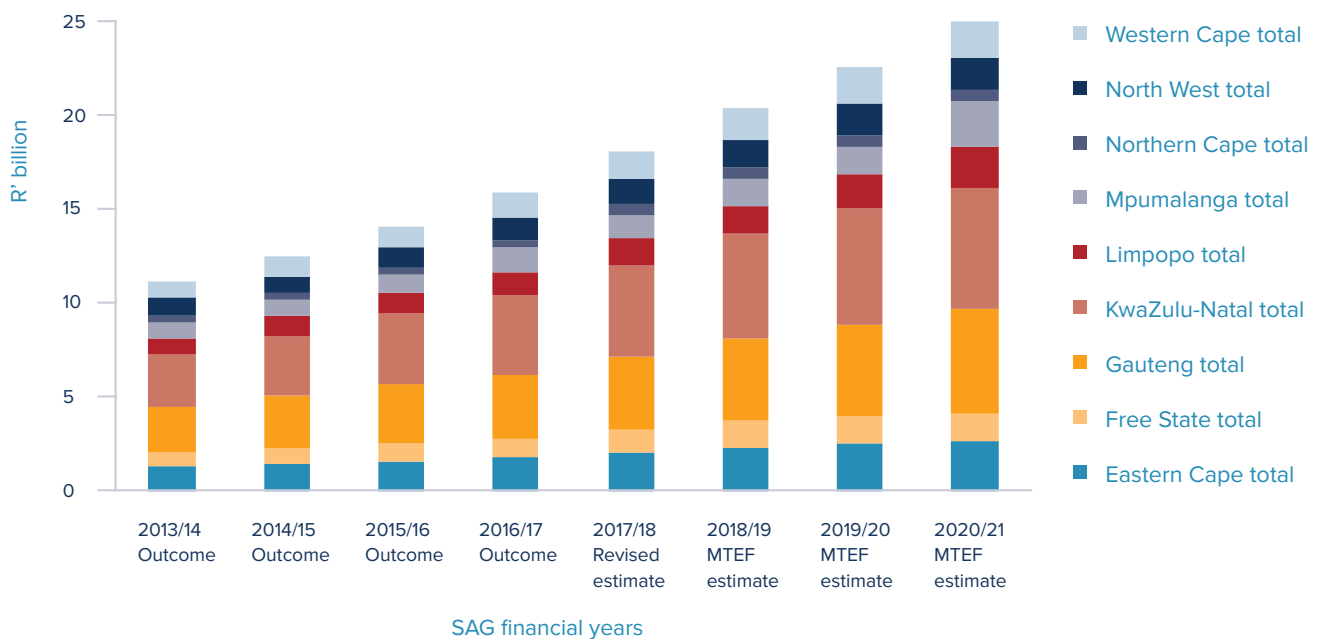
Table 3: Consolidated national and provincial health-HIV and TB allocations by government funding channel, 2013/14 - 2020/21, South Africa (R'000, nominal)

R'000	SAG financial years							
	2013/14 Outcome	2014/15 Outcome	2015/16 Outcome	2016/17 Outcome	2017/18 Outcome	2018/19 MTEF estimate	2019/20 MTEF estimate	2020/21 MTEF estimate
National CG to provinces	10 488 542	11 993 257	13 608 145	15 330 383	17 557 903	19 921 697	22 038 995	24 438 000
Total provincial ES	675 315	518 158	489 643	555 069	528 803	432 371	419 142	511 972
Total direct national ES (excl. CGs)	370 392	470 711	354 355	415 517	446 597	542 103	572 505	530 300
Grand total	11 534 249	12 982 126	14 452 143	16 300 969	18 533 303	20 896 171	23 030 642	25 480 272

Source: National Treasury, 2017;¹⁵ National Treasury, 2017;¹⁸ National Treasury, 2019.¹⁷
CG = Conditional Grant; ES = equitable share; MTEF = medium-term expenditure framework.

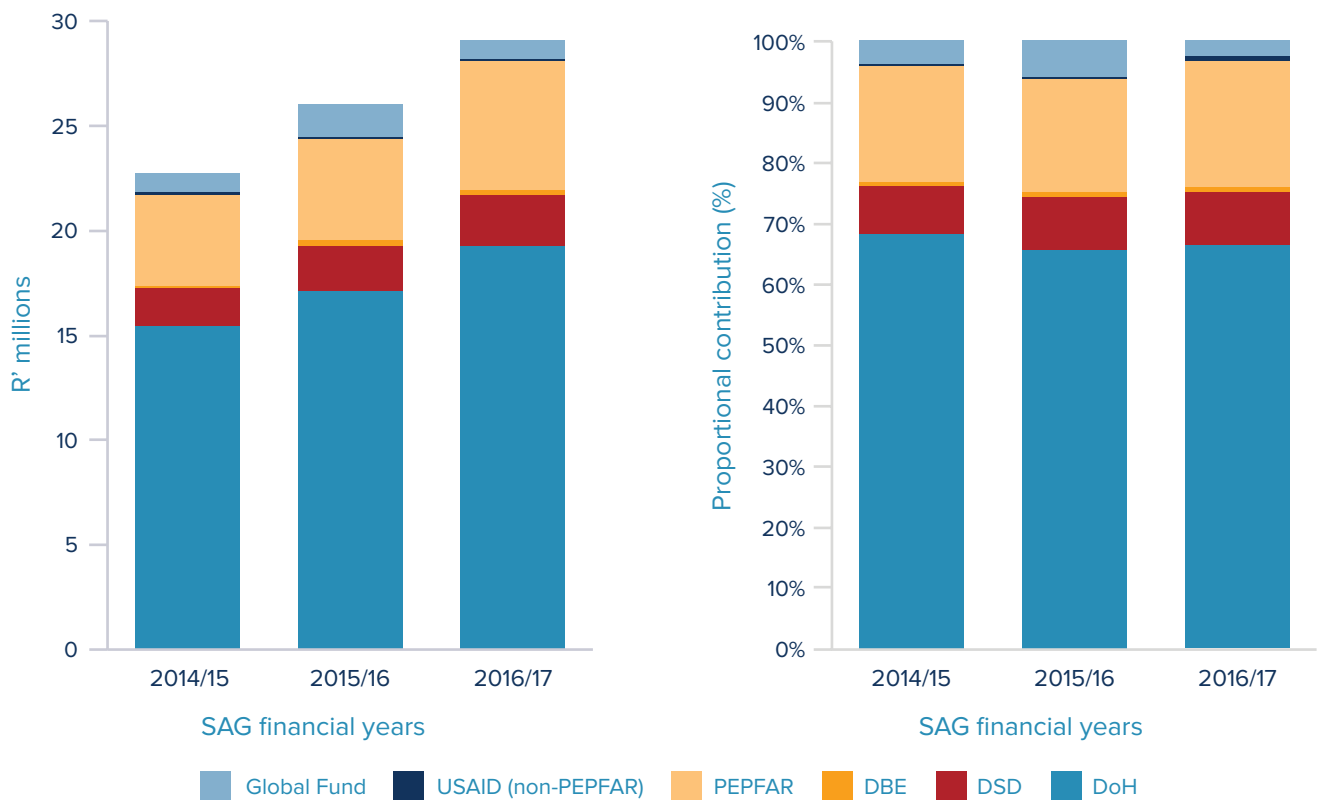
- c The MTEF for 2019/20 - 2021/22, published after this study was completed, further expands the grant's scope and divides it into separate components for HIV and AIDS, TB, malaria, and community outreach.
- d The allocation formula is reported in the Division of Revenue Act²⁰ every year.
- e Previous studies have covered earlier years.
- f The district-level analysis in this study only included SAG and US Government spending because Global Fund data were not geographically disaggregated.
- g The TB expenditure figures presented in this section are therefore much higher than the budgeted figures presented above, which could only identify the conditional grant ring-fenced amounts for TB, and that also excluded the donor contributions to TB.

Figure 3: Combined health-HIV and TB conditional grant and equitable share funding by province. 2013/14 - 2020/21, South Africa (R' billion, nominal)



Sources: National Treasury, 2017;¹⁸ National Treasury, 2019.¹⁷ (Authors' calculations.)
MTEF = medium-term expenditure framework; SAG = South African Government.

Figure 4: Total HIV and TB spending by source and year (R' millions) (left) and funder share (%) (right), South Africa, 2014/15 - 2016/17



Source: Guthrie et al., 2018.¹¹

DBE = Department of Basic Education; DSD = Department of Social Development; NDoH = National Department of Health; PEPFAR = President's Emergency Plan for AIDS Relief; USAID = United States Agency for International Development.

of total spending (66% by the NDoH, 9% by the DSD and 1% by the DBE), followed by the US Government (21%) and the Global Fund (3%) (Figure 4, right panel). An analysis of the previous three-year period (2011/12 - 2013/14) found that in 2013/14 the SAG contributed 80% (R17.8 billion), the US Government 17% (R3.7 billion), and the Global Fund 3% (R662 million) of the total R18.4 billion^h for HIV and TB.⁹

Donor commitments to HIV and TB in South Africa remained strong despite long-term expectations of declining external support. Support from the US Government, mainly through PEPFAR, grew over the three years, from R4.2 billion in 2014/15 to R6.0 billion in 2016/17.ⁱ The US Government contribution increased steadily from 19% to 21% over the same period. This trend may reverse in the coming years given that PEPFAR's spending in South Africa is expected to decline to R5.8 billion in 2019/20.²⁵ Meanwhile, after Global Fund spending increased from R865 million in 2014/15 to R1.5 billion in 2015/16, its contribution dropped to R806 million (3%) in 2016/17. This mainly reflected sluggish spending in the first year of a new three-year grant cycle. Importantly, the new Global Fund grant amounted to R4.3 billion^j for 2016 - 2018, compared with roughly R3 billion spent from the 2013 - 2015 grant.

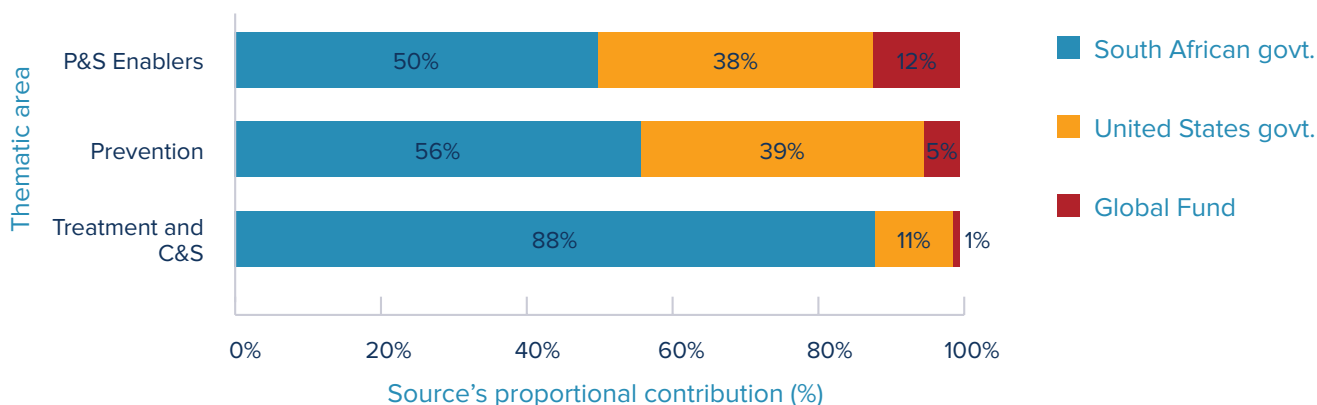
The extent of South Africa's reliance on external funding varies across HIV programme areas (Figure 5). In 2016/17, the SAG financed 88% of HIV treatment costs (including care and support). In contrast, only slightly more than half (56%) of spending on prevention – including youth and workplace interventions, condom distribution, and an independent human papilloma virus vaccination programme – was

financed domestically. Likewise, the SAG contributed 50% of investments in programme enablers such as communication, social mobilisation, and advocacy activities, as well as the DSD's substance-abuse prevention and training efforts. Interventions for which donors provided more than half the financing in 2016/17 included HIV testing services, prevention of mother-to-child transmission (PMTCT), medical male circumcision (MMC), and outreach to key populations.

The South African Government's spending on ART increased from R9.8 billion in 2014/15 to R12.8 billion in 2016/17, reflecting the steady expansion of treatment – by the end of 2016/17, nearly 4 million people living with HIV (PLHIV) remained in care. The next biggest areas of spending were home-based care (9%), HIV testing services (7%), care for orphans and vulnerable children (7%) and MMC (4%).

Spending on TB also continued to rise due to growing domestic and donor financing, increasing from R2.5 billion in 2014/15 to R2.9 billion in 2016/17, an annual average 8% increase over the three years. In 2016/17, the SAG (via the NDoH) accounted for 77% of total TB spending, with the US Government contributing 22% (nearly 16% through PEPFAR and 6% through separate USAID funding). The Global Fund contributed R30 million in 2016/17, 1% of total TB spending, and also funded integrated TB/HIV interventions for key populations, such as for inmates of correctional services and peri-mining populations, which were coded in the study as HIV spending. The Global Fund's continuing commitment to TB is reflected in the new Global Fund grant covering 2019 - 2021.

Figure 5: Funder relative contributions to HIV programme areas, South Africa, 2016/17 (%)



Source: Guthrie et al., 2018.¹¹

C&S = care and support; P&S = programme and social.

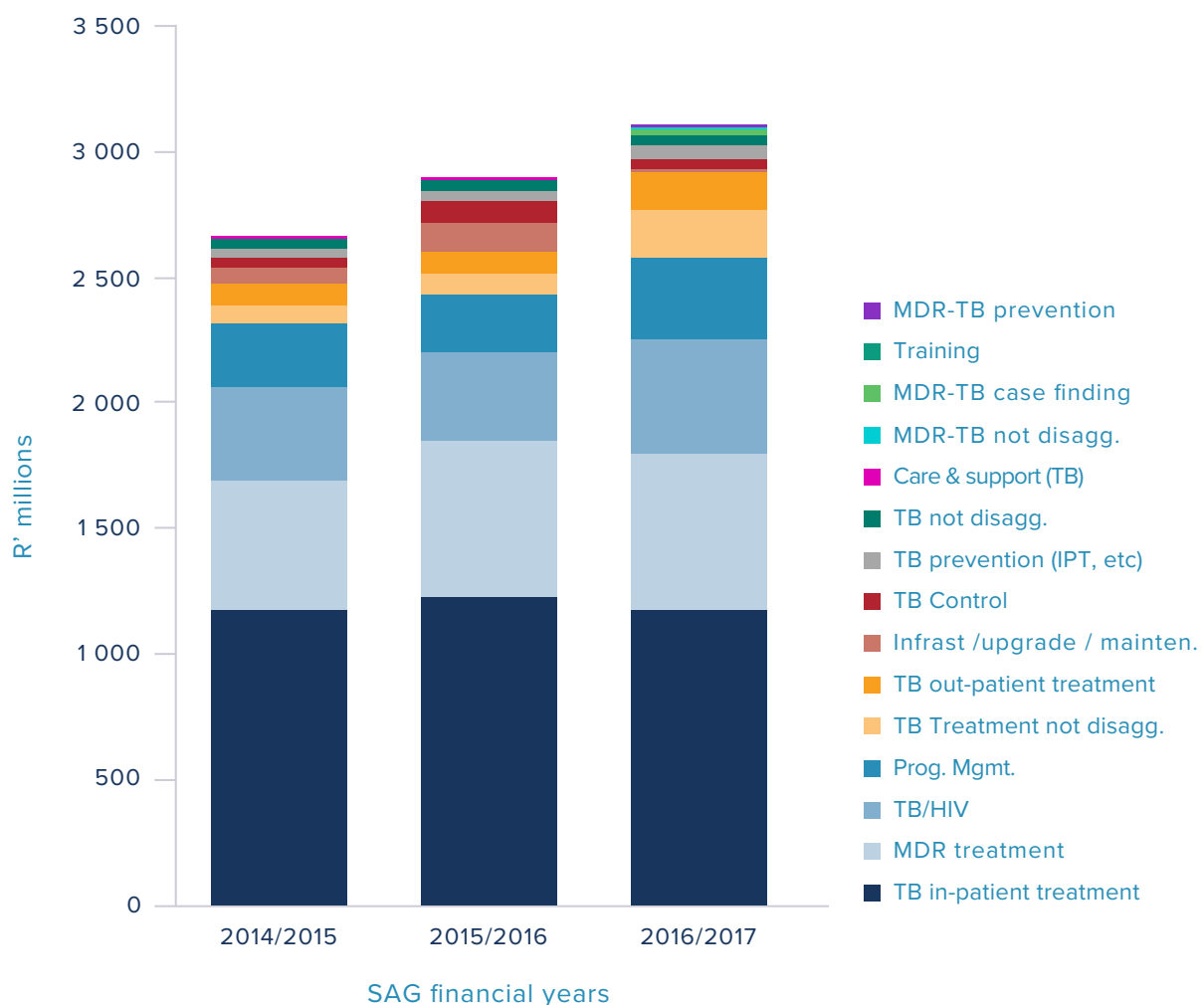
- h Note that the previous analysis (2011/12 - 2013/14) included some estimates of TB spending in the public sector, due to weaker coding than in the current period of study.
- i The US dollar amount of PEPFAR's contribution decreased from 2014/15 to 2015/16, but the Rand value increased due to the weakening Rand.
- j This amount is equivalent to the US\$324 million committed by the Global Fund, based on an exchange rate of R13.25 per US dollar used by the Global Fund in the approved budget for the 2016 - 2018 grants, provided by the South African National AIDS Council.

The NDoH's TB spending focused mostly on treatment of drug-sensitive and drug-resistant cases (Figure 6), while prevention efforts were funded mostly by the US Government, and multidrug-resistant (MDR)-TB case finding and care and support were funded mostly by the Global Fund. The largest portion of NDoH spending was captured under 'hospitals' in the BAS records, and therefore labeled as 'TB inpatient treatment'. However, this included medicines for outpatients visiting clinics in hospital catchment areas and hence included some outpatient TB treatment as well. Additionally, estimates of NDoH spending on TB prevention, case finding, screening and diagnosis are likely too low because salary costs of public sector health

workers who provided TB services were not labeled as TB-specific in the BAS. The analysis was also generally hampered by poor coding of TB spending by certain provinces,^k limiting comparison and full understanding. Promisingly, there were signs of improvement in the coding of TB spending from voted funds since the previous study for the period 2012/13 - 2014/15.⁹

The district-level analysis of combined SAG and US Government spending on HIV (undertaken for the first time in a recent HIV and TB expenditure review),¹¹ found that spending was roughly distributed according to HIV burden, proxied by numbers of PLHIV in each district.^l KwaZulu-Natal

Figure 6: Total TB spending by intervention, South Africa, 2014/15 - 2016/17 (R' millions)



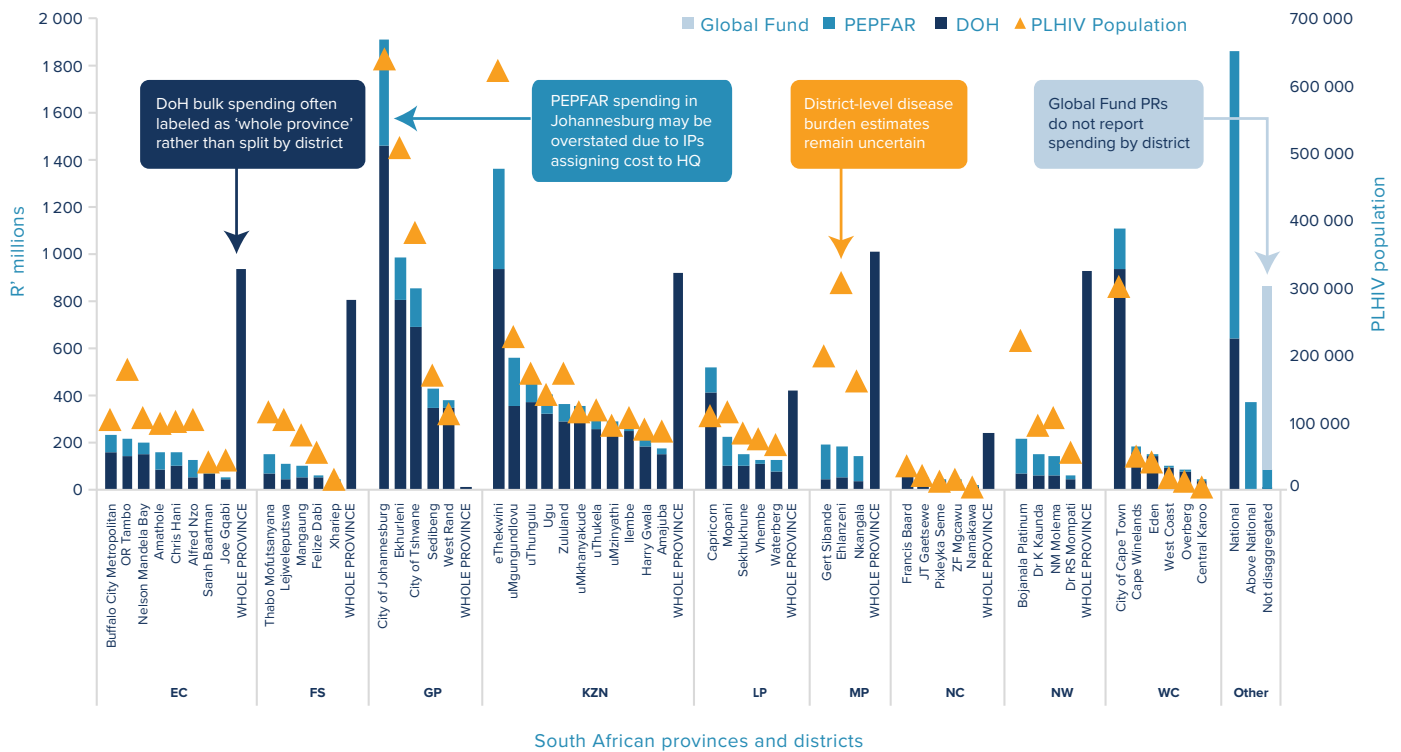
Source: Guthrie et al., 2018.¹¹

Note: The NDoH's HIV/TB integration efforts, including HIV/TB testing, were coded as HIV spending in this study. Some values are too small to appear in Figure 6.

disagg. = disaggregated; Infrast/upgrade/mainten. = infrastructure upgrade and maintenance; IPT = isoniazid preventive therapy; MDR-TB = multi-drug resistant tuberculosis; Prog. Mgmt = programme management; SAG = South African Government.

- k For example, North West provincial DoH did not label any TB in their BAS records, yet they treated 16 762 TB patients in 2016/17. KwaZulu-Natal coded their TB spending more consistently, and thus displayed the greatest TB spend, also reflecting their greater burden of disease.
- l For this analysis, the district PLHIV estimates were provided by PEPFAR. These estimates were based on three sources: The Antenatal Care Survey, the Human Sciences Research Council HIV Behavioural Survey, and the NDoH's 'total remaining on ART' indicator, and they are generally accepted until the Thembeisa model generates more reliable district estimates. Unfortunately, Global Fund spending could not be disaggregated by district.

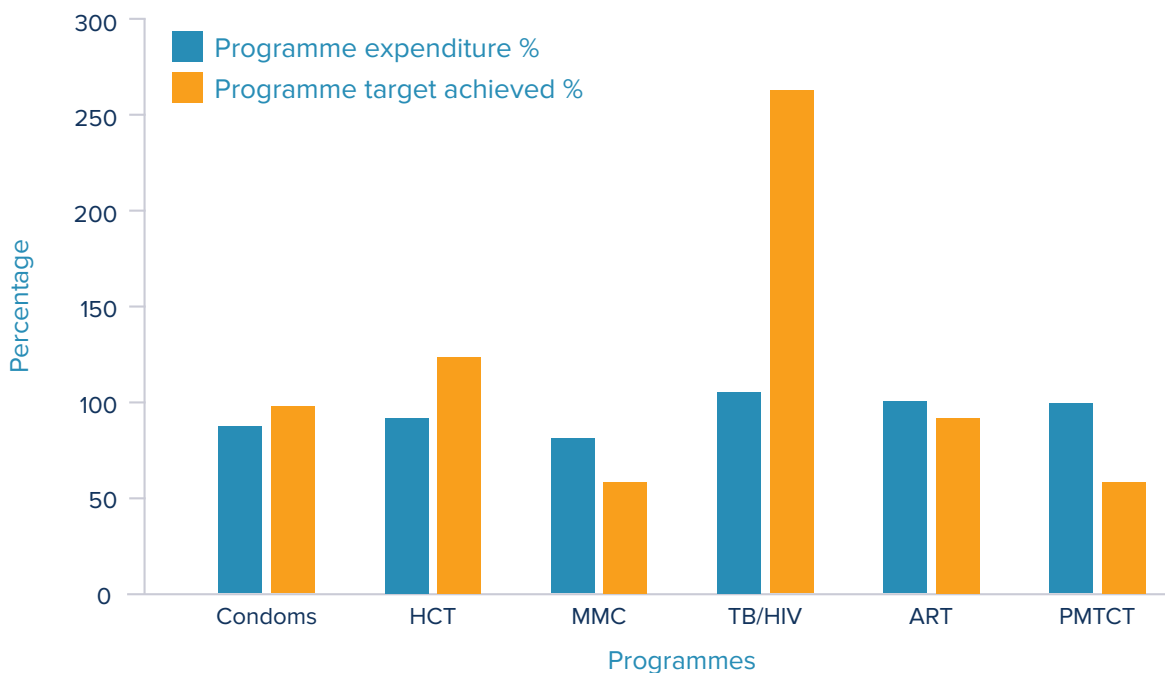
Figure 7: HIV spending by district and funder (R' millions, left axis) and number of people living with HIV (right axis), South Africa, 2016/17



Source: Guthrie et al., 2018.¹¹

EC = Eastern Cape; FS = Free State; GP = Gauteng; HQ = headquarter; IP = implementing partner; KZN = KwaZulu-Natal; LP = Limpopo; MP = Mpumalanga; NC = Northern Cape; NW = North West; PR = principal recipient; WC = Western Cape.

Figure 8: Comprehensive HIV, AIDS and TB conditional grant sub-programme spending against selected performance targets, South Africa, 2016/17 (%)



Source: Simelane et al., 2018.¹⁰

ART = antiretroviral therapy; HCT = HIV counselling and testing; MMC = medical male circumcision; PMTCT = prevention of mother- to- child transmission.

and Gauteng, the most HIV-burdened provinces, spent the most on HIV. Eight metropolitan areas accounted for over a quarter of HIV spending (26%), reflecting the concentration of PLHIV in major cities like Johannesburg, Durban (eThekweni), Tshwane and Cape Town (Figure 7). Deeper analysis of district-level HIV spending was hampered by large shares of SAG expenditure being coded in the BAS as ‘whole province’ rather than individual districts. Additionally, neither the Global Fund nor its principal recipients report spending by district.

NDoH HIV and TB sub-programme analysis

The detailed planning and reporting of the conditional grant enabled further analysis of provincial expenditure and programmatic performance. In addition to absorbing budgets, it is important that provinces spend on the correct programme areas and achieve programmatic performance

targets for which finances were allocated. Table 4 and Figure 8 show the difference between provincial DoH total sub-programme absorption rates,^m and the percentage of sub-programme targets achieved.

Given that the conditional grant sub-programmatic budgets are based on business plans costed in line with provincial targets, ideally sub-programme spending should be closely aligned with target achievement, unless some efficiency gains (where performance outpaces expenditure, such as for HIV testing services) or dramatic cost hikes (where expenditure eclipses performance, such as for MMC and PMTCT) happened during the year. Figure 8 shows variances between expenditure and performance in 2016/17.

Absorption of the ART sub-programme budget was 101% in 2016/17, while the number of clients remaining on treatment

Table 4: Provincial DoH core national performance targets and actual performance (2016/17), financial and non-financial data (HIV, AIDS and TB conditional grant), South Africa, 2015/16 - 2016/17

Sub-programme	Indicator	Baseline (2015/16)	2016/17 Targets	2016/17 Performance	2016/17 Budget R'000	2016/17 Expenditure R'000	2016/17 Expenditure %	Target achieved %
Condoms	Number of male condoms distributed	833 397 571	924 615 352	912 786 845	429 283	374 366	87.2	98.7
HIV testing services	Number of clients tested for HIV (including antenatal)	12 417 523	11 760 312	14 488 440	875 931	811 271	92.6	123.2
Medical male circumcision	Number of medical male circumcisions performed	464 629	700 000	415 114	350 318	286 436	81.8	59
HIV/TB	Number of HIV-positive clients screened for TB	1 103 975	1 173 450	3 077 692				262.3
	Number of HIV-positive clients started on IPT	390 701	575 746	393 400	610 903	648 260	106.1	68
ART	Number of patients on ART remaining in care	3 403 605	4 164 131	3 806 194	10 714 297	10 885 298	101.6	91.4
PMTCT	Number of babies PCR-tested at 10 weeks	97 688	257 571	151 084	275 866	273 761	99.2	58.7

Source: Adapted from NDoH, 2017.²

ART = antiretroviral therapy; IPT = isoniazid preventive therapy; PCR = polymerase chain reaction; PMTCT = prevention of mother-to-child transmission.

m Absorption rate is the percentage of the budget spent.

was 3 806 194, only 91.4% of the target of 4 164 131.⁴ Provinces failing to meet their targets reported challenges with capturing data on the District Health Information Software, and data-verification problems with districts.

The condom sub-programme achieved 98.7% of its 2016/17 target, while on average spending only 87.2% of the allocation, with some provinces over- or under-achieving. Provincial HIV managers attributed under-performance to lack of dedicated transport from storage sites to facilities, inadequate condom storage capacity, and late deliveries of condoms by suppliers. Corrective measures taken included implementation of standard operating procedures, regular correspondence between suppliers and provincial programme managers, and assistance from the NDoH with registration of suppliers in provinces where they provide services.

The MMC sub-programme was the second-lowest-performing sub-programme in 2016/17, achieving only 59% of its target. Moreover, despite a 43% increase in MMC spending from 2015/16 to 2016/17, the number of circumcisions performed declined by 21%, from 524 401 to 415 114. Further analysis is required to identify cost drivers and understand the increased spending despite declining performance. Suggested actions included deployment of dedicated MMC social mobilisers and provision of transport to MMC sites.

The TB/HIV sub-programme had mixed performance in 2016/17 as it over-achieved (262.3%) against its target with regard to the number of HIV-positive clients screened for TB, but under-performed (68% achieved) on the number of HIV-positive clients started on isoniazid preventive therapy. The NDoH has worked to strengthen TB screening for all HIV-positive clients but records only newly HIV-diagnosed clients to avoid double-counting.² Nevertheless, the TB/HIV sub-programme recorded the largest budget absorption rate in 2016/17 at 106%.

Conclusions

The results reported in this chapter show the magnitude of HIV and TB spending, and trends for this spending by the SAG, the US Government and the Global Fund. The study results have also informed the management and planning processes of all three funders.ⁿ Members of the study team have provided capacity building and technical support to provincial DoHs to address many of the challenges expressed by their programme and financial managers in budget planning and execution. Tools and processes are being enhanced through the Financial Capacity and Technical Support Project for Provinces, a USAID-funded partnership programme between the NDoH, the Health

Economics and Epidemiology Research Office, and the Centre for Economic Governance and Accountability in Africa. Ongoing analyses are needed to generate fresh data for annual and future planning purposes.

HIV and TB budget allocations are expected to grow in the future, despite the fiscal constraints in the country. However, the challenge remains to reduce new HIV infections, which continue to put pressure on the government's overall response and financing of HIV and TB. Although ART contributes to reduced HIV infection rates, major prevention efforts are still required, and these are among the HIV interventions currently most dependent on donor funding.

Recommendations

Timely and accurate data on spending trends are critical for policy, planning and programme management. More effort needs to be made to integrate output analysis and routine expenditure analysis in order to measure value-for-money and impact. Routine expenditure analysis can facilitate dialogue between national and sub-national actors, especially the NDoH, National Treasury and provincial DoHs to improve technical efficiency given the scarcity of public resources. Such analysis could also help the government and partners to compare their past and current budgets with spending and outputs, and better understand issues of efficiency and equity. This information could also be combined with findings from the South African HIV and TB Investment Case²⁶ to allow government officials to make and defend sometimes controversial decisions to reallocate funds across interventions or geographies.

Harmonised analysis of domestic and donor spending enables better joint planning, including full ownership of financing responsibility by government and eventual transition away from donor support. The breakdown in this review of SAG, US Government and Global Fund contributions to specific HIV and TB interventions should inform government with regard to future domestic resource allocation and sustainability, particularly donor-dependent interventions.

Lessons learnt in financing the HIV and TB responses through the Conditional Grant Framework²⁰ should inform resourcing and management of other public policy priorities. This analysis shows the value of ring-fenced funding, which allows for detailed and accurate expenditure tracking directly linked to outputs. The incorporation of community outreach services into the grant could extend these benefits to an increasingly integrated pool of funds for PHC services. The impact of these efforts should be monitored and reflected upon to see how best provincial HIV and TB sub-programme performance can be further enhanced.

ⁿ Within the SAG, the findings gained most traction within the NDoH. The national DSD also found the expenditure tracking findings useful but noted that measurement against the provincial performance was challenging because the funds are voted and therefore provincial DSDs are not obliged to report to national officials on their use.

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Health and related indicators:

interrogating the UHC service coverage index

Authors

Candy Dayⁱ
Andy Grayⁱⁱ
Noluthando Ndlovuⁱ
Annibale Coisⁱ

Sustainable Development Goal 3.8 challenges every country to achieve “universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all”.

The Sustainable Development Goals have focussed attention on achieving Universal Health Coverage in all countries. A UHC service delivery index has been developed to monitor country progress towards that goal. This chapter explores the application of the index to South Africa, over time and disaggregated to provincial and district level. Alternative measures that might be more sensitive indicators of service coverage and quality of care are also presented. Data have been extracted from periodic surveys conducted between 1998 and 2018 and routine health service delivery data gathered between financial years 2000/01 and 2018/19. Considerable new analyses were performed in the areas of child treatment, non-communicable diseases and human resources. New time series estimates of the uninsured population at district level were prepared to enable calculation of service coverage in the public sector.

Three versions of the overall UHC service coverage index were calculated. Index 1 relied to the greatest extent possible on nationally representative survey data. Index 2 substituted routine data sources wherever possible, allowing disaggregation to provincial level. Index 3 was adapted from Index 2 to allow disaggregation to district level. At a national level, the most recent values for Index 1 and Index 2 were 61.8 and 61.5, respectively. Index 1 improved from 24.3 in 1998-2002 to 61.8 in 2016-2018, reflecting expansion in population coverage of services. Index 3 was somewhat lower at 56.9 in 2016-17, and varied from 44 to 62 at district level.

Overall, the adapted South African UHC indices are lower than those reported previously, primarily due to the inclusion of more effective coverage indicators.

i Health Systems Trust

ii Division of Pharmacology, Discipline of Pharmaceutical Sciences, University of KwaZulu-Natal

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Introduction

In the preface to the World Health Organization/World Bank report entitled “Tracking Universal Health Coverage: 2017 Global Monitoring Report” the Director-General of WHO and President of the Bank noted that “never before has there been as much political momentum for universal health coverage as there is right now”.¹ That is certainly the case in South Africa, with the tabling in August 2019 of the National Health Insurance Bill (Bill 11 of 2019).² The 2017 Global Monitoring Report also reminded us that “never before has there been greater need for commitment to health as a human right to be enjoyed by all, rather than a privilege for the wealthy few” and that “we are also encouraged that – although data availability and analysis are still a challenge – most countries are already generating credible and comparable data on health coverage”.

Sustainable Development Goal 3.8 challenges every country to achieve “universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all”. Two high-level indicators have been developed for this target:

- Indicator 3.8.1: Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health; infectious diseases; non-communicable diseases; and service capacity and access; among the general and the most disadvantaged population); and
- Indicator 3.8.2: Proportion of population with large household expenditures on health as a share of total household expenditure or income.

The basis of the 2017 Global Monitoring Report is the universal health coverage (UHC) service coverage index. The development of the UHC service coverage index and the baseline data per country were published in 2018 by Hogan et al.³ The UHC service coverage index is calculated as the geometric mean of 16 indicators, 4 for each of the service area categories listed in indicator 3.8.1. The first of these four categories covers the reproductive, maternal, newborn, and child health measures tracked by the Countdown to 2030 Collaboration.⁴ The other three categories measure infectious disease control, non-communicable disease management, and service capacity and access.

The 2017 Global Monitoring Report has defined some key concepts that inform the choice of indicators and data sources:

- effective service coverage, “the proportion of people in need of services who receive services of sufficient quality to obtain potential health gains” is a preferred measure, where available;
- service coverage, “the proportion of people in need of a service that receive it, regardless of quality”, is, however, more commonly measured and reported;

- tracer indicators, which focus on selected conditions, are necessary, as all conditions cannot be tracked with the same level of detail in most settings; and
- proxy indicators, which are correlated with the provision of health services to those in need, may be either ‘upstream’ (such as indicators of capacity, access or service utilisation) or ‘downstream’ (such as prevalence of a risk factor or mortality rates), and might be used where more direct measures of service coverage or effective service coverage are not available.

The resultant UHC service coverage index was described as “a single indicator that is computed based on tracer indicators (some of which are proxies of service coverage) to monitor coverage of essential health services”.

Considerable resources have also been provided by WHO to guide methods for the scaling of indicator data and the computation of the index.^{5, 6}

Alternative approaches have been proposed. In 2018 the GBD 2017 SDG Collaborators published the results of a systematic analysis of Global Burden of Disease data, showing progress on 41 health-related SDG indicators between 1990 and 2017 for 195 countries and territories, and calculated a health-related SDG index (of which an adapted UHC index was one component).⁷ The authors point out that “the most vulnerable populations within countries are still at risk of being left behind”, particularly in low- and middle-income countries. One way to ensure appropriate resource allocation and service delivery is to disaggregate the data to sub-national level (such as provinces and districts).

Earlier, Wagstaff *et al.* devised what they termed a ‘mashup’ UHC index, covering both service coverage (divided into prevention and treatment services) and financial protection.⁸

Table 1 shows the 15 indicators that have been incorporated in a South African UHC service coverage index (excluding the indicator on malaria). The SA index has been based predominately on the methods proposed by Hogan et al., with some elements adapted from the GBD SDG 2017 Collaborators’ methods.

In the 2018 issue of the *Review* we presented a first attempt at computing the UHC service coverage index from the best available South African data, at national and provincial level.⁹ In this chapter, we expand on that analysis, justifying alternative measures that might be more sensitive indicators of service coverage and quality of care (i.e. of effective service coverage), and showing trends over time down to district level where feasible. Data have been extracted from periodic surveys conducted between 1998 and 2018 and routine health service delivery data gathered between financial years 2000/01 and 2018/19. Major periodic survey sources have included the national Censuses, South African Demographic and Health Surveys (SADHS), the Statistics South Africa Community Surveys (CS) and General Household Surveys (GHS), the

South African National Health and Nutrition Examination Survey (SANHANES) and the South African National HIV Prevalence, Incidence, Behaviour and Communication Surveys (SABSSM). Data have also been drawn from the five 'waves' of the National Income Dynamics Study (NiDS), a longitudinal panel study. Routine data have been extracted from the District Health Information System (DHIS), the public sector personnel records (PERSAL), National Department of Health (NDoH) records, and the electronic tuberculosis and HIV register (Tier.net). Modelled data have been obtained from the Thembisa model of the South African HIV epidemic (Thembisa 4.2). At times, the only accessible national figures are those reported in global reports from WHO, UNICEF or the Global Burden of Disease (GBD) studies. The resultant UHC service coverage index results have been compared with those previously reported at the national level.

This chapter represents the results of considerable new analyses of existing data and the development of new data by the authors, as follows:

- routine data across the time series have been updated to reflect consistent population denominators, any updates and cleaning to the numerator data, changes in indicator definition and alignment to the current 2016 municipal boundary demarcations;
- a new time series of estimates of the uninsured (public sector dependent) population at district level has been prepared, which enabled the calculation of service coverage in the public sector;
- the most recent four years of public sector human resource data have been extracted and subjected to an extensive data coding process to identify occupational classifications and geographic location (health facility/district) for the key professions (medical practitioners, professional nurses, pharmacists);

Table 1: Calculating the South African Universal Health Coverage (UHC) service coverage index

Service area category	Tracer	Index calculation
RMNCH	UHC1: Family planning (FP)	$RMNCH = (FP * ANC * Imm * Pneum)^{1/4}$
	UHC2: Pregnancy and delivery care (ANC)	
	UHC3: Child immunisation (Imm)	
	UHC4: Child treatment (Pneum)	
Infectious	UHC5: TB treatment (TB)	$Infectious = (TB * HIV * WASH)^{1/3}$
	UHC6: HIV treatment (HIV)	
	UHC7: Malaria (excluded)	
	UHC8: Water and sanitation (WASH)	
NCDs	UHC9: Prevention of cardio-vascular disease (BP)	$NCD = (BP * Diab * CervCA * Tobacco)^{1/4}$
	UHC10: Management of diabetes (Diab)	
	UHC11: Cancer detection (CervCA)	
	UHC12: Tobacco control (Tobacco)	
Capacity	UHC13: Facility access (Beds)	$Capacity = (Beds * HWD * Meds * IHR)^{1/4}$
	UHC14: Health worker density (HWD)	
	UHC15: Access to essential medicines (Meds)	
	UHC16: Health security (IHR)	
Index	UHC service coverage index	$UHC\ index = (RMNCH * Infectious * NCD * Capacity)^{1/4}$

Source: Adapted from Hogan et al.³

Note: See source for details on calculation and rescaling of the index components.

- indicators have been calculated from existing data that had not previously been widely published, particularly in relation to the non-communicable disease data from NiDS;
- alternative indicator sources have been included, attempting to adjust for bias or quality or to increase the use of routine data, thus providing a more complete time series.

As always, it is not possible to verify, adjust and correct every data source in detail. Caution is therefore advised with regard to which types of indicators are presented and whether their

use is suitable for the intended purpose.¹⁰ Recommendations for future work are provided, especially in the context of the development of a unitary health system under NHI. Key healthcare quality and delivery issues which are not covered by the UHC service coverage index are also identified. The chapter concludes with a series of reference tables.



Reproductive, maternal, newborn and child health indicators (RMNCH)

UHC 1 COUPLE YEAR PROTECTION RATE (CYPR)

This is a sensitive proxy of the contraceptive prevalence rate and is collected using routine data.

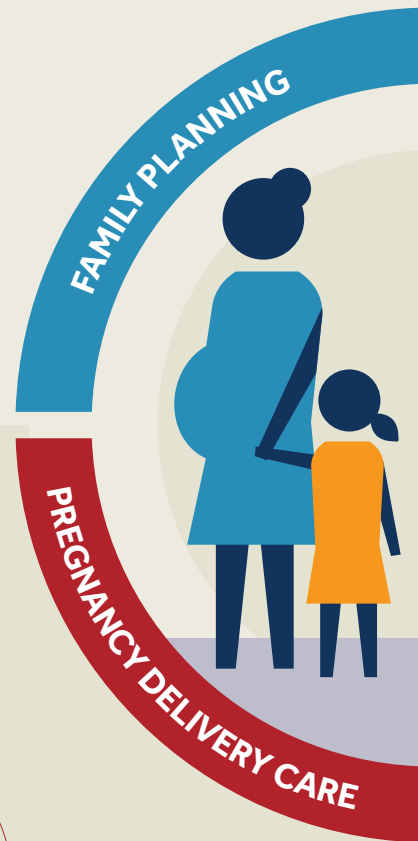
CALCULATING CYPR CONSIDERS SERVICE DELIVERY OF:

-  Oral contraceptive pills
-  Hormone injections
-  Intrauterine devices
-  Sub-dermal implants
-  Male and female condoms
-  Male and female sterilization

CYPR SHOWS GREATER CHANGE OVER TIME

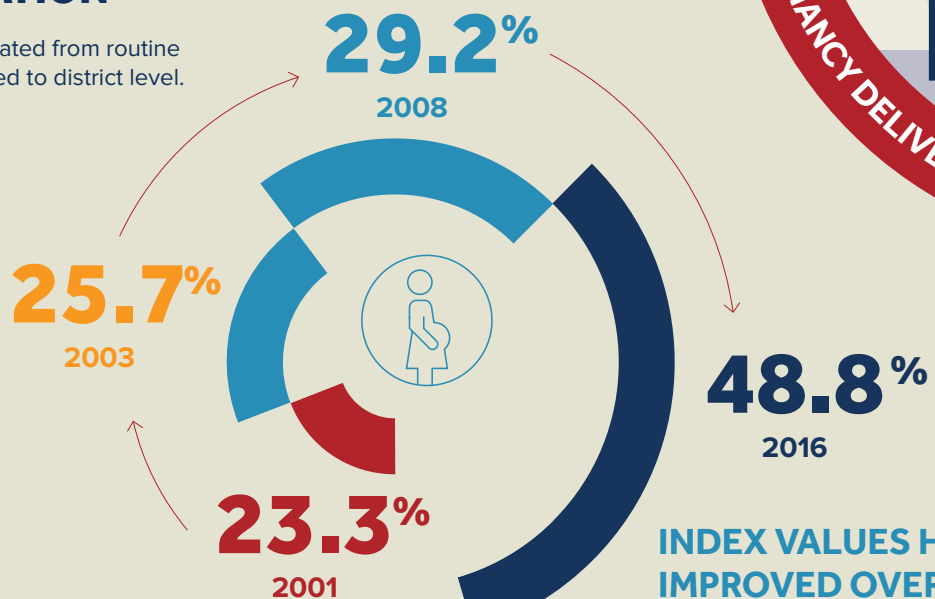
70.1% 2016-2018

25.3% 2000



UHC 2 WOMEN WHO ATTEND ANC BEFORE 20 WEEKS' GESTATION

A measure of quality care calculated from routine data, which can be disaggregated to district level.



INDEX VALUES HAVE IMPROVED OVER TIME



ALTERNATIVE MEASURES OF SERVICE COVERAGE



Women who attend at least one antenatal visit.



Deliveries which occur in a health facility.



Indicator insights

RMNCH indicators frequently measure service coverage and not effective service coverage (i.e. quality of care). In response to this, several other measures have been proposed that are adjusted for quality, user-adherence (i.e. if care is complying with standard treatment guidelines) or outcomes of coverage.

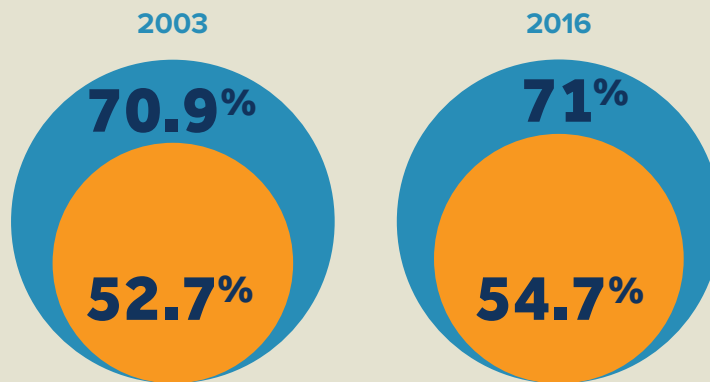
UHC 3 COMPLETE IMMUNISATION UNDER 1 YEAR WITH THE EXPANDED PROGRAMME ON IMMUNISATION (EPI) REGIMEN

While this is only a measure of service coverage, it considers multiple antigens and avoids complications of new combination vaccines being introduced.



ESTIMATES OF IMMUNISATION COVERAGE ARE HIGHER FROM ROUTINE DATA (DHIS) THAN SURVEY DATA (SADHS)

DHIS
SADHS



COMPARISON OF IMMUNISATION COVERAGE

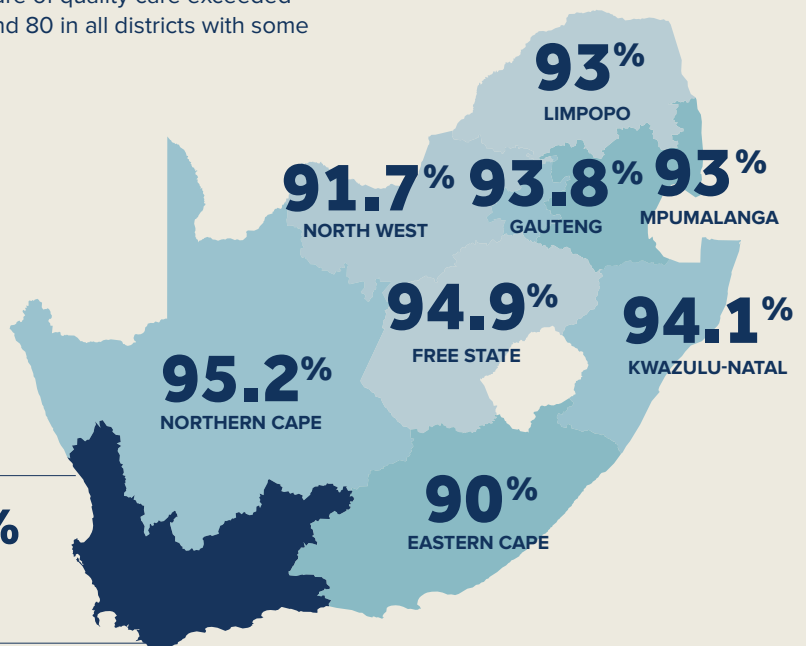
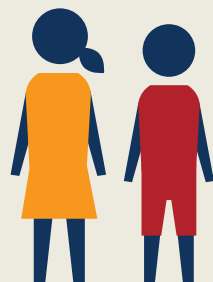


UHC 4 PNEUMONIA CASE FATALITY RATE (CFR) IN CHILDREN UNDER 5 YEARS OF AGE (RESCALED)

In 2018/19, this measure of quality care exceeded 90 in all provinces, and 80 in all districts with some approaching 100.



PROGRESS OVER TIME IS EVIDENT AT THE NATIONAL LEVEL



The Western Cape in particular has shown substantial progress over time

98.8%
WESTERN CAPE

Note: The rescaled value is the inverse of the CFR, calculated by applying the WHO guidance according to the formula: index = (max risk value - original value) / (max risk - min risk) x 100

Reproductive, maternal, newborn, and child health indicators

The first category of the UHC service coverage index covers the priority areas of reproductive, maternal, newborn, and child health (RMNCH), with a tracer indicator for each component (family planning, pregnancy and delivery care, child immunisation, and child treatment).

UHC1: Family planning

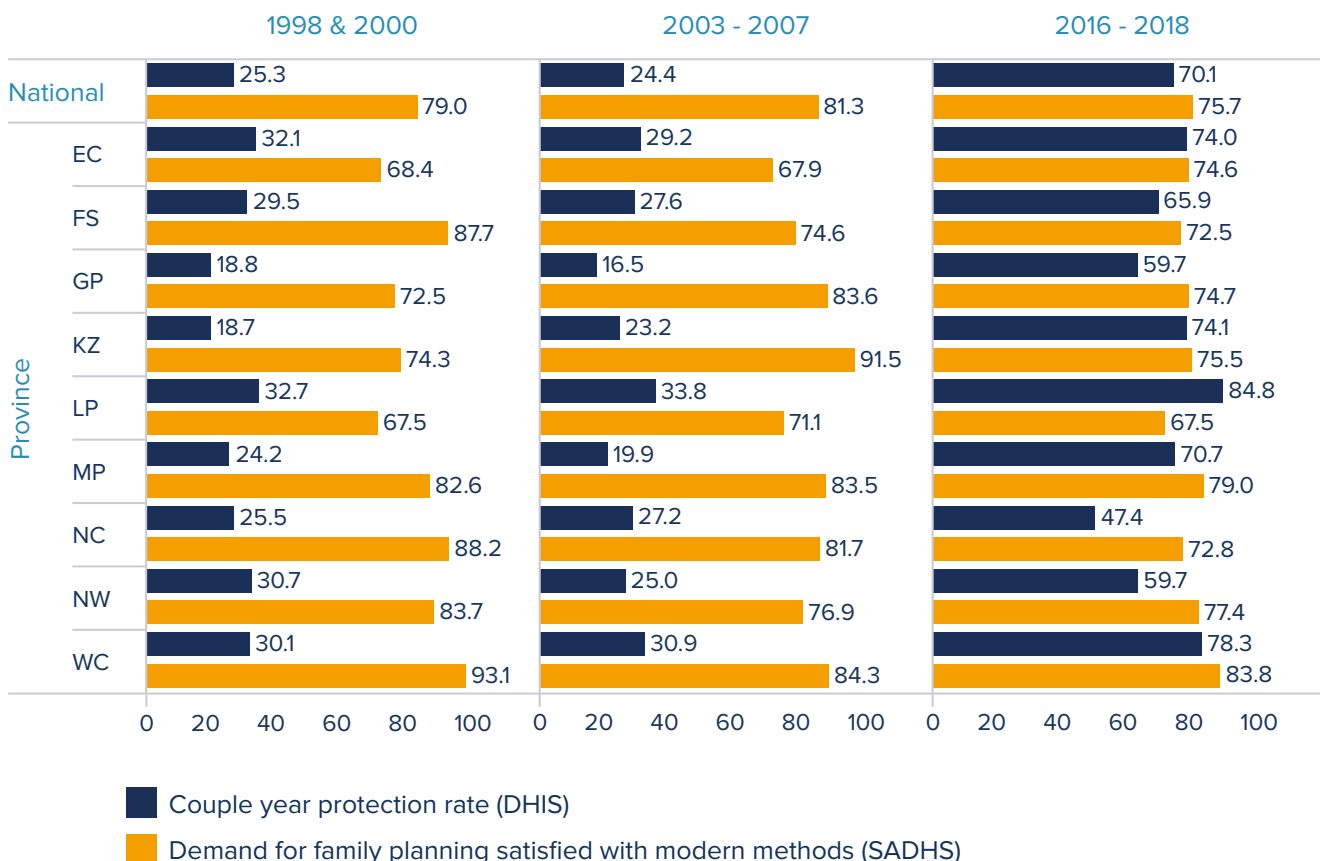
The first indicator is an effective service delivery measure, with a preventive focus, defined as the percentage of family planning demand satisfied with a modern method among women aged 15-49 years who are married or in a union. This indicator was measured in the three SADHS surveys (1998, 2003, 2016). There have been differences though in how each cohort of women (in-union, sexually active, currently married, all women aged 15-49 years) was reported. Little change in the indicator has been seen between the three SADHS surveys. A more sensitive proxy of the contraceptive prevalence rate, relying on routine data, may therefore be the couple year protection

rate (CYPR), which has been reported in DHIS since 2000/01 and allows disaggregation to district level. DHIS has relied on the WHO method to calculate CYPR since 2016/17, and used service delivery data on the supply of individual contraceptive methods to calculate the CYPR as the sum of (oral contraceptive pill cycles / 15), (medroxyprogesterone injection / 4), (norethisterone enanthate injection / 6), (intrauterine contraceptive device x 4.5), (sub-dermal implant x 2.5), (male condoms distributed / 120), (female condoms distributed / 120), (male sterilisation x 10) and (female sterilisation x 10).

Figure 1 shows a comparison of the CYPR figures for 2000, 2003 and 2016 with the percentage of demand satisfied with modern contraceptive methods in sexually active and married women reported in SADHS in 1998, 2003 and 2016, nationally and per province. Although the CYPR appears to show greater change over time, there are concerns that this may be the result of the considerable increase in male (and to a lesser extent female) condom distribution over the period. The CYPR cannot distinguish single method and dual method use, so may over-estimate the proportion of couples protected.

Although the survey measures both demand and supply, and the routine measure is focused only on supply, by 2016 there was remarkable correspondence between the two measures. There are provinces in which the trends are in opposite directions – in the Northern Cape, for example, the measure of supply has improved, whereas the proportion of women with satisfied demand has declined. In Limpopo, supply appears

Figure 1: Comparison of family planning indicators from routine and survey-based sources



to have improved while the proportion satisfied has remained unchanged. The CYPR data rely predominantly on public sector sources, so do not adequately reflect the situation in the private sector or insured market. It is worth noting that unintended pregnancy has been shown to be prevalent in South Africa, despite higher than expected contraceptive coverage.¹¹ A projection of the costs of meeting total family planning demand, has estimated that an increase of about 30% would be needed by 2023.¹² The avoidable cost of early removal of sub-dermal implants was highlighted in this analysis.

Indicators

A key consideration for the future might be to revisit the CYPR formula, in order to reduce the potential distortion caused by condom provision.

Table 2 contrasts the contraceptive method mix reported in the SADHS 2016 with the contribution each method made to the CYPR reported in the last five financial years.

The contribution to the percentage of contraceptive years by each method has also been calculated per district for 2018/19. An illustrative example of the Eastern Cape districts is shown in Table 3.

UHC2: Pregnancy and delivery care

The preferred measure of pregnancy and delivery care for the UHC service coverage index is the percentage of births attended by skilled health personnel, but there are challenges with the definition of 'skilled health personnel' in different

countries. As a result, the index reported by Hogan *et al.* relied on the percentage of women attending four or more antenatal care (ANC) visits. The preferred measure was included in SABSSM 2008 and was also reported in SADHS in 1998, 2003 and 2016. Survey data show a high proportion of births attended by skilled health personnel (84.4% in 1998, 91.2% in 2003, 94.3% in 2008 and 96.7% in 2016). Other alternatives, which are less sensitive to the quality consideration, would include indices based on women who attend at least one antenatal visit and deliveries which occur in a health facility. Both are accessible from DHIS for the public sector.

A proxy measure which incorporates a measure of quality of care is the index of women who attend ANC before 20 weeks' gestation, which can be calculated from routine data and disaggregated to district level. The index is calculated as follows: ANC first visit coverage (capped at 100%) multiplied by the first visit before 20 weeks rate (equivalent to ANC first visit before 20 weeks divided by the estimated number of pregnant women, for which a proxy is the population under 1 year multiplied by a factor of 1.15).

Table 4 shows how the index values for women accessing antenatal care before 20 weeks' gestation has improved between 2000/01 and 2018/19, but also how there is still room for improvement. Only in two provinces (Mpumalanga and the Northern Cape) does the index exceed 60 in 2018/19. District data, however, show that for some districts, including Nelson Mandela metropole, the index is still below 40.

Figure 2 depicts the range of values for the chosen index over time, nationally, provincially and per district, compared with the alternative proxy measures, drawn from survey and routine sources.

Table 2: Contraceptive method mix, SADHS and DHIS, national

Contraceptive method	SADHS	CYPR per method (DHIS)				
	2016	2014/15	2015/16	2016/17	2017/18	2018/19
Female condoms distributed	0.1	1.2	1.5	1.4	1.1	0.9
IUCD inserted	1.2	1.2	0.5	0.7	1.1	1.5
Male condoms distributed	15.6	39.8	46.3	49.8	37.1	38.5
Medroxyprogesterone	17.5	9.2	9.2	9.5	9.7	9.9
Norethisterone enanthate	7.3	4.3	4.1	3.9	4.0	2.1
Oral pill cycle	7.3	1.6	1.6	1.6	1.5	1.8
Sterilisation female	5.7	2.2	2.2	2.5	2.6	2.9
Sterilisation male	0.4	0.1	0.1	0.0	0.0	0.1
Sub-dermal implant inserted	4.1	2.9	1.4	0.8	2.1	3.4
Contraceptive prevalence rate/ Couple year protection	59	62.4	66.8	70.2	59.2	61.0

0  50

Table 3: Percentage of couple years of protection per method, illustrative example, Eastern Cape districts, 2018/19

Components	CYPR	Fem condoms distr	IUCD inserted	Male condoms dist	Medroxyprogesterone	Norethisterone enant	Oral pill cycle	Sterilisation fem	Sterilisation male	Sub-dermal implant insert	All methods
ec Alfred Nzo DM	31.8	2.7	0.4	54.8	26.8	6.3	2.6	4.2	0.0	2.2	100
ec Amathole DM	59.6	1.6	0.8	66.3	20.1	7.4	1.2	1.8	0.0	0.7	100
ec Buffalo City DM	53.0	0.9	2.2	54.3	27.6	7.3	1.6	4.6	0.0	1.5	100
ec Chris Hanani DM	74.1	2.6	0.1	69.4	16.6	5.4	1.2	2.8	0.0	1.9	100
ec Joe Gqabi DM	54.5	2.2	0.8	69.3	18.8	5.2	1.5	1.2	0.0	1.0	100
ec Nelson Mandela Bay MM	52.3	0.5	1.9	52.4	26.5	7.6	3.0	5.9	0.0	2.2	100
ec Oliver Tambo DM	48.4	4.3	0.7	57.7	20.7	6.0	1.7	7.4	0.0	1.5	100
ec Sarah Baartman DM	67.0	1.7	1.1	61.6	21.8	5.4	1.6	3.2	0.2	3.4	100



Notes: DM = District Municipality, MM = Metropolitan Municipality

Table 4: Antenatal 1st visit coverage before 20 weeks (index), 2001/02 to 2018/19

		DHIS																	
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
National		23.3	26.3	25.7	27.1	28.7	28.4	26.9	29.2	28.6	30.4	32.1	32.0	41.7	45.0	45.8	48.8	51.4	55.0
Province	EC	25.1	26.1	24.1	22.7	22.4	19.0	16.0	18.6	20.4	23.8	26.4	29.0	32.7	34.7	34.9	36.1	38.0	40.5
	FS	33.6	33.6	17.1	31.9	36.0	36.7	38.4	39.8	38.1	37.7	37.7	41.7	44.0	47.0	43.8	47.4	48.7	51.6
	GP	20.3	21.8	24.0	25.4	25.5	24.7	23.8	23.5	25.0	28.7	33.9	36.7	43.4	46.1	47.5	51.1	52.6	57.5
	KZ	20.1	29.0	28.0	25.7	29.1	30.7	29.3	29.3	26.7	27.8	25.0	17.7	44.8	44.8	45.6	47.8	50.7	54.8
	LP	26.1	29.4	28.3	30.9	32.5	32.2	28.3	35.5	35.2	33.7	33.8	32.8	37.3	43.8	47.8	53.9	52.7	57.6
	MP	23.7	25.7	27.1	29.9	31.0	28.4	24.5	29.1	27.7	28.8	30.9	35.3	41.6	49.0	53.5	55.6	66.0	66.5
	NC	25.9	28.6	31.2	37.9	40.2	45.5	42.4	45.9	41.1	45.3	47.2	49.2	54.4	57.7	57.2	62.8	62.4	63.1
	NW	24.4	22.6	23.0	22.2	25.3	26.3	26.8	28.6	29.1	28.8	31.8	35.1	39.7	43.9	44.2	48.9	52.0	53.9
	WC	26.3	25.2	26.9	28.7	31.4	34.1	35.7	40.5	41.0	42.9	41.6	42.3	47.2	52.1	49.7	52.8	55.1	59.1



Figure 2: Range of pregnancy and delivery care indicators, 1998 to 2018/19

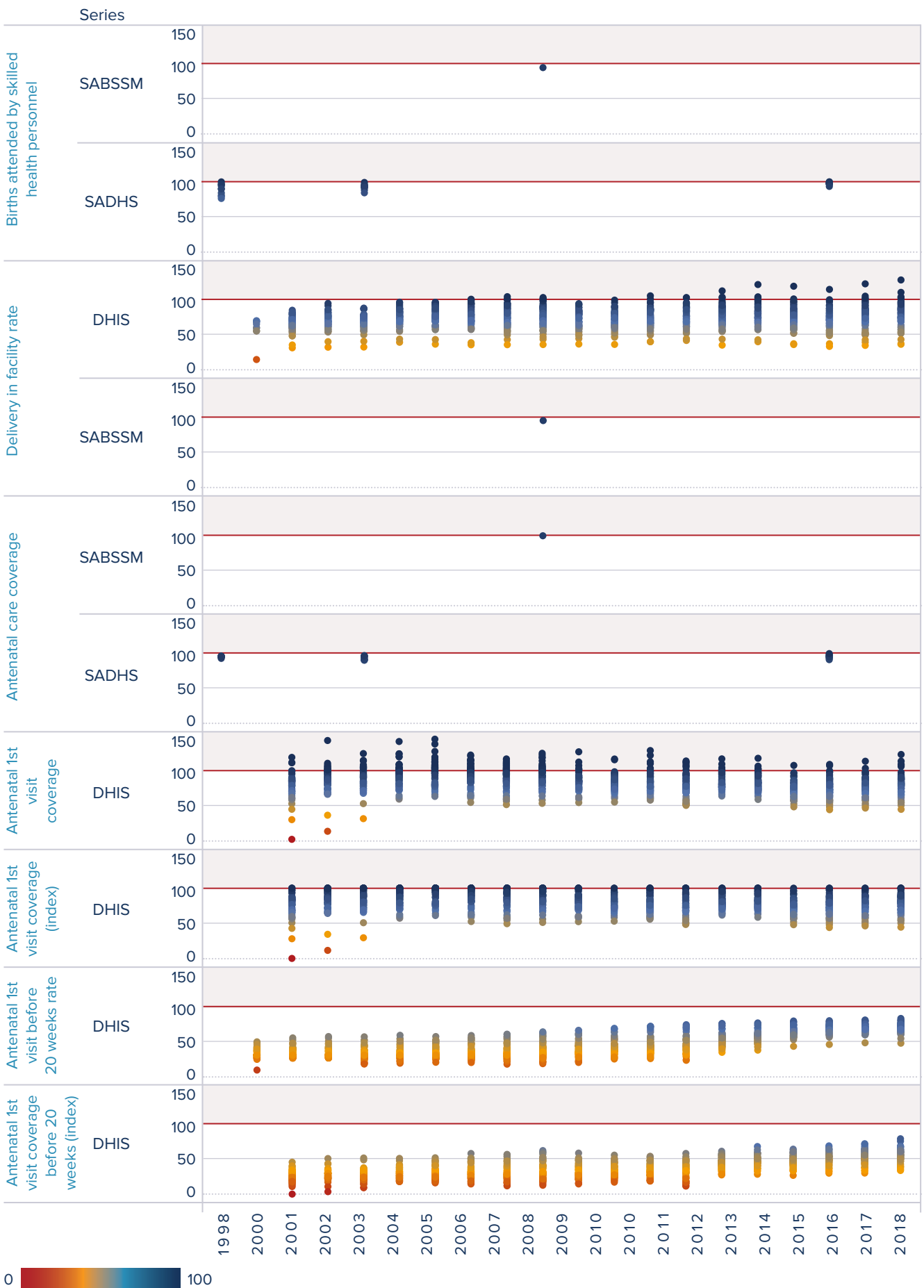


Figure 3 compares the survey data on the births attended by skilled health personnel in 1998, 2003, 2008 and 2016 with the routine data on the chosen index (first ANC visit coverage before 20 weeks' gestation) and its components in 2001/02, 2003/04, 2008/09 and 2016/17, at the national level.

UHC3: Child immunisation

Child immunisation rates measure service coverage, and not necessarily effective coverage (though in most cases, efficacy can be assumed). The index reported by Hogan et al. relied on the percentage of children aged under 1 year who had received three doses of diphtheria, tetanus and pertussis (DTP) vaccine, whether administered as such or as part of a polyvalent vaccine. Given the lower coverage rates for other antigens, alternatives were proposed, such as the percentage receiving the second measles dose. DTP3 coverage or immunisation coverage in infants aged 12-23 months have been recorded in surveys, including SADHS (2003 and 2016) and SABSSM (2008). An Africa-wide analysis of DTP3 coverage data for the period 2000 to 2016 was recently published, but did not include South African data.¹³ In line with the global trend towards using multiple antigens, the South African index has been calculated using complete immunisation under 1 year with the Expanded Programme on Immunisation (EPI) regimen at that point in time.^{3,7} This also avoids the complications in tracking DTP3 coverage using routine data due to the introduction of new combination vaccines, which has resulted in changes to the data elements collected in facilities over time.¹⁴

Routine DHIS data allow for the calculation of an index, rescaled to a maximum of 100, based on immunisation coverage for all vaccines in the EPI regimen by age 1 year.

This can be done per province, and also per district.

Figure 4 shows the comparison of the range of raw data and index values over time, and the alternative measures as reported from routine and survey sources and by multilateral bodies (WHO/UNICEF).

Although earlier problems with the population estimates used for the denominator have been addressed, it is clear that vaccine coverage figures from routine data (DHIS) are substantially higher than those obtained through survey methods (SADHS or SABSSM).^{15,16} Both estimates may be biased for different reasons.¹⁷ A purpose-designed immunisation survey is currently in process and will be invaluable in resolving the differences between routine and survey estimates.¹⁸

Figure 5 shows the differences between both the DTP3 measure and the immunisation coverage under 1 year, as measured in surveys (SADHS and SABSSM) and from routine service delivery data (DHIS) over time. The modelled national DTP3 figures reported by WHO/UNICEF are also shown for comparison.¹⁹ In both 2003 and 2016 the SADHS estimate of immunisation coverage was lower than that reported from routine data. It may be that assessing a complex indicator such as completion of all immunisations under 1 year is prone to error when captured in surveys.

Figure 6 shows the same comparison per province in 2016. The same trend is evident, except in the Free State. The validity of the DTP3 measure reported in SADHS 2016 for the Free State, which is far higher than that recorded in Gauteng, may be open to question. The same can therefore be said of the alternative measure, immunisation coverage under 1 year.

Figure 3: Comparison of pregnancy and delivery care indicators by source and over time, national

Indicator	Series	1998 & 2001	2003	2008	2016
Births attended by skilled health personnel	SABSSM			94.3	
	SADHS	84.4	94.1		96.7
Antenatal 1st visit coverage (index)	DHIS	76.5	87.7	89.7	74.9
Antenatal 1st visit before 20 weeks rate	DHIS	30.5	29.3	32.5	65.2
Antenatal 1st visit coverage before 20 weeks (index)	DHIS	23.3	25.7	29.2	48.8

Figure 4: Range of child immunisation indicators, 1998 to 2018/19

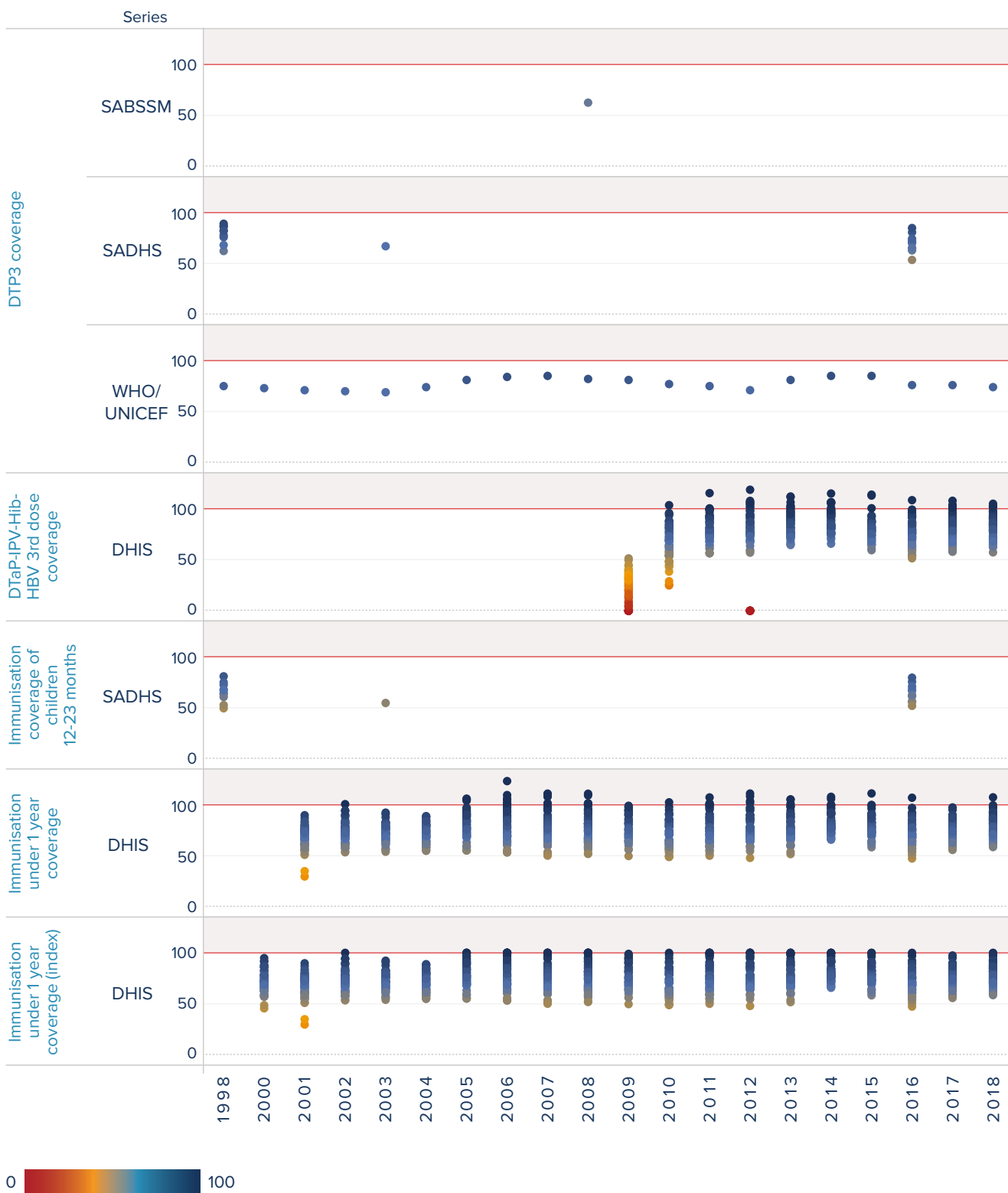


Figure 5: Comparison of immunisation indicators by source and antigen, national

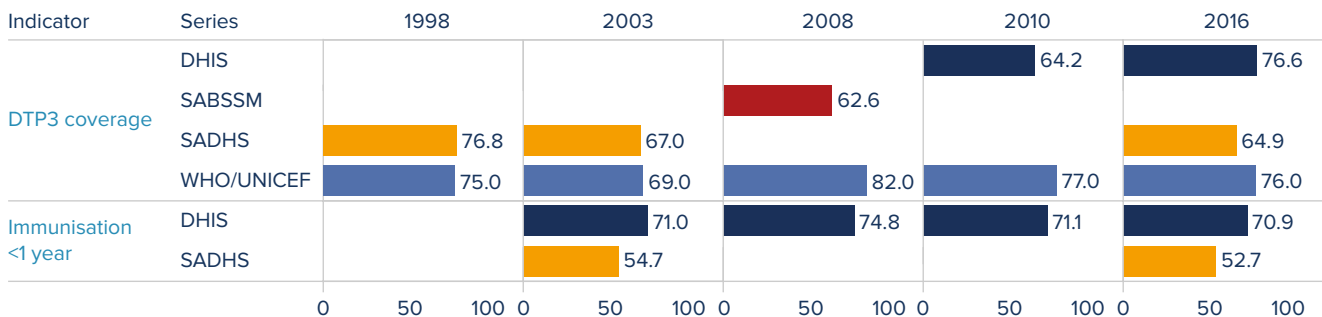
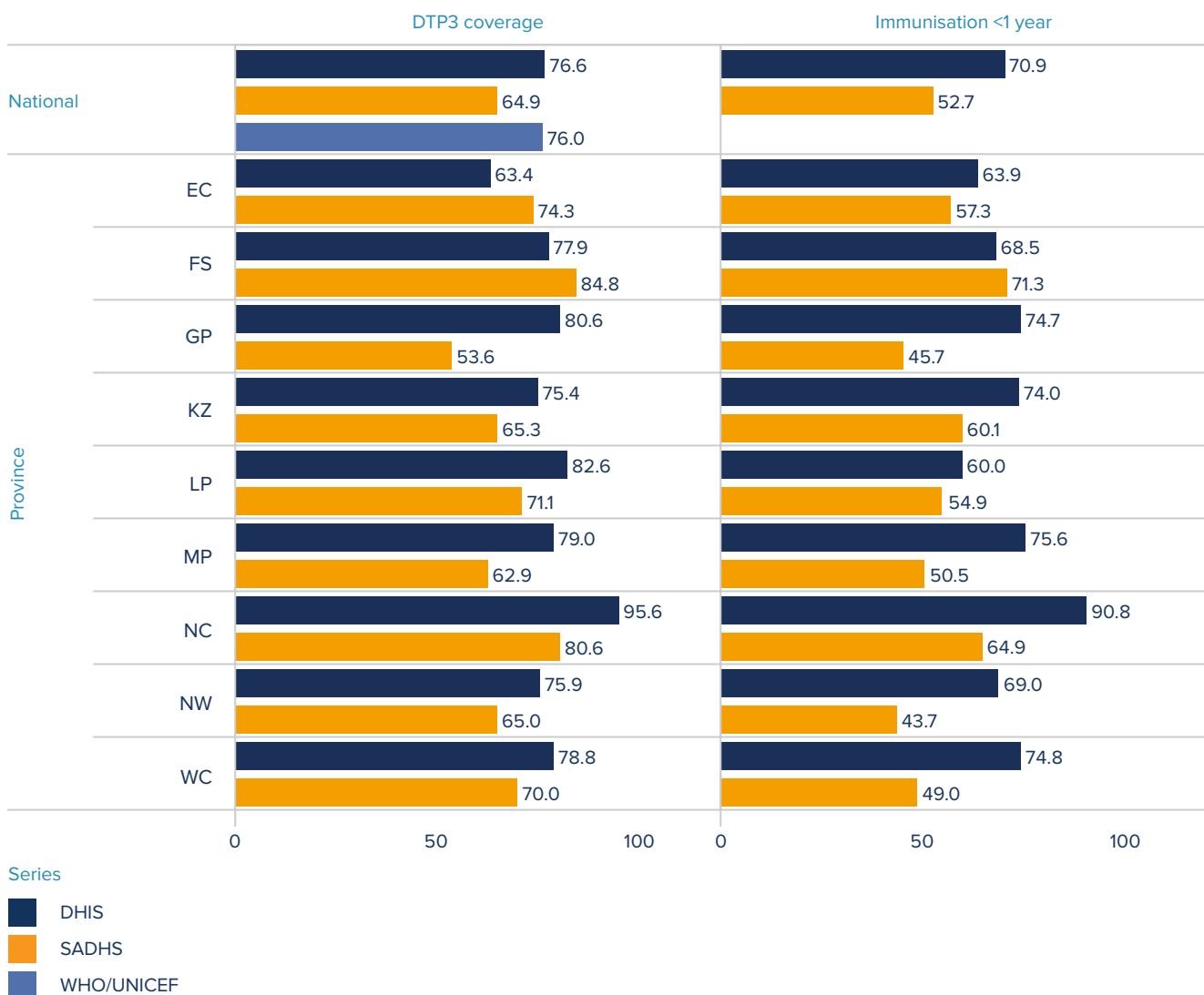


Figure 6: Comparison of immunisation indicators by source and antigen, national and provincial, 2016



UHC4: Child treatment

Given the contribution of lower respiratory disease (including pneumonia) to childhood morbidity and mortality, this is an appropriate target for the final RMNCH measure, child treatment.²⁰⁻²² The indicator reported by Hogan *et al.* is care-seeking behaviour for children with suspected pneumonia, expressed in percentage terms. This measure is amenable for inclusion in survey instruments, which ask caregivers about illnesses their children might have had in the previous two weeks. At best, this is a service coverage indicator, as the quality of care accessed cannot be measured. The measure is also subject to recall bias. SADHS 2016 reported on the percentage of children with symptoms of acute respiratory infection for whom advice or treatment was sought; however, the numbers are so small that only a single national figure is provided. An alternative, which can be obtained from routine DHIS data, is an index based on the pneumonia case fatality rate (CFR) in children under 5 years of age. The pneumonia CFR under 5 years is defined as the pneumonia deaths in children under 5 years as a proportion of pneumonia separations under 5 years in health facilities. It therefore only measures those deaths that occur in children who have been admitted to a health facility. In this case, after removing four outlier values in four different districts, a smoothed estimate of the pneumonia CFR under 5 years was computed using a generalised additive model with thin-plate splines. The WHO advice on rescaling a continuous measure is to apply the formula: $\text{index} = (\text{max risk value} - \text{original value}) / (\text{max risk} - \text{min risk}) \times 100$. Figure 7 illustrates the smoothing and the rescaled index values for pneumonia CFR over time, the routine data proxy for child pneumonia treatment access.

Figure 8 shows the range of the rescaled CFR index values, before and after smoothing, as well as the single survey data point from 2016.

Figure 7: Pneumonia CFR (smoothed) with corresponding rescaled index, national and provincial, 2005/06 to 2018/19

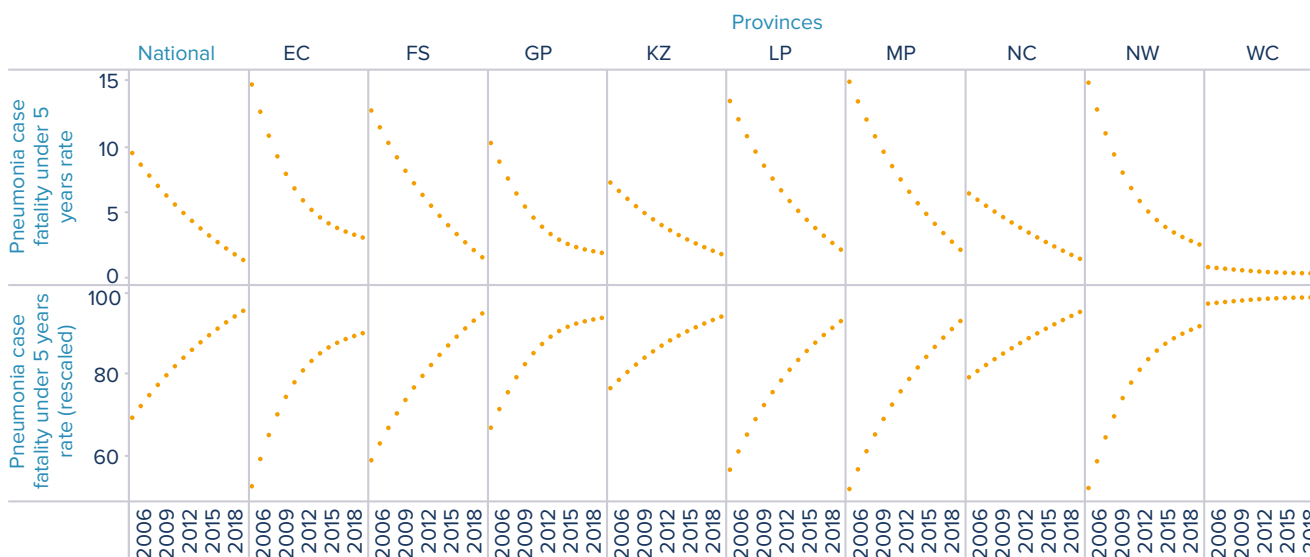


Table 5 provides a heatmap, showing the smoothed index values over time, per province and per district. Both at a provincial and district level, the progress over time is evident, with the index exceeding 90 in all provinces, 80 in all districts, and approaching 100 in some districts, in 2018/19. The consistent performance in the Western Cape over time is also striking. Progress in reducing under 5 mortality from malnutrition and diarrhoeal disease has also been documented, based on routine DHIS data, with rates in Western Cape markedly lower throughout the 2011/12-2016/17 time period under review.²³

Even though disaggregation by district is useful, there are other important determinants of inequality in access to RMNCH services, such as poverty, women's age and educational status, sex of the child, and disability.²⁴ An analysis of data from SABSSM 2008 showed that differences in maternal health status were more likely to be due to differences in quality of care, HIV status and social determinants of health, rather than in access to healthcare services.²⁵ Equity considerations can be incorporated in survey designs, but pose challenges for sample sizes, especially when rare outcomes such as mortality are measured. Finer geographical disaggregation is possible with routine data, if facilities are carefully geo-located and classified. However, a persistent problem with many RMNCH indicators, including those listed here, is that they measure service coverage and not effective service coverage. A cascade of measures has been proposed, ranging from crude coverage to quality-adjusted coverage, user-adherence adjusted coverage (care that complies with standard treatment guidelines) and finally outcome-adjusted coverage.²⁶

Figure 8: Range of child care indicators (raw and rescaled), 2000/01 to 2018/19



Table 5: Smoothed pneumonia case fatality rate (rescaled) by geographic level, 2005/06 to 2018/19

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
National		69.3	72.1	74.8	77.3	79.7	81.9	84.0	85.9	87.8	89.5	91.1	92.7	94.1	95.5	
Province	EC	52.4	59.1	65.0	70.1	74.4	78.0	80.9	83.2	85.1	86.5	87.6	88.6	89.3	90.0	
	FS	58.8	63.0	66.8	70.3	73.6	76.7	79.5	82.2	84.7	87.0	89.2	91.2	93.1	94.9	
	GP	66.8	71.4	75.5	79.2	82.4	85.1	87.4	89.1	90.5	91.6	92.4	92.9	93.4	93.8	
	KZ	76.5	78.6	80.5	82.3	84.0	85.5	86.9	88.2	89.4	90.5	91.5	92.4	93.2	94.1	
	LP	56.5	61.0	65.1	68.9	72.4	75.5	78.4	81.0	83.4	85.7	87.7	89.6	91.3	93.0	
	MP	51.8	56.6	61.0	65.2	69.0	72.5	75.7	78.8	81.6	84.2	86.6	88.9	91.0	93.0	
	NC	79.2	80.7	82.2	83.6	85.0	86.3	87.6	88.8	90.0	91.1	92.2	93.2	94.2	95.2	
	NW	52.0	58.6	64.4	69.6	74.1	77.9	81.0	83.6	85.7	87.4	88.8	89.9	90.8	91.7	
	WC	97.3	97.5	97.7	97.9	98.0	98.2	98.4	98.5	98.6	98.7	98.7	98.8	98.8	98.8	
District	EC	BUF	54.2	62.7	70.0	76.2	81.5	85.9	89.2	91.8	93.6	94.9	95.6	95.9	96.1	96.1
		DC10	89.6	90.5	91.3	92.0	92.8	93.5	94.2	94.9	95.6	96.3	96.9	97.6	98.2	98.8
		DC12	7.7	27.0	42.6	55.3	65.5	73.4	79.5	84.0	87.3	89.7	91.3	92.3	93.0	93.6
		DC13	14.0	33.2	48.5	60.9	70.6	78.0	83.5	87.4	90.0	91.6	92.3	92.5	92.2	91.8
		DC14	44.2	50.3	56.0	61.1	65.8	70.1	74.0	77.6	80.9	83.9	86.7	89.3	91.7	93.9
		DC15	0.0	16.1	29.7	40.9	50.2	57.7	63.9	68.9	72.9	76.2	79.0	81.3	83.3	85.2
		DC44	34.0	42.7	50.3	56.9	62.6	67.4	71.5	75.0	77.9	80.3	82.4	84.2	85.9	87.4
		NMA	60.8	67.1	72.6	77.2	81.0	84.0	86.3	87.9	89.0	89.6	89.0	89.7	89.5	89.1
	FC	DC16	59.4	64.3	68.8	72.9	76.7	80.1	83.3	86.2	88.8	91.3	93.6	95.7	97.6	99.4
		DC18	64.6	66.8	69.0	71.2	73.4	75.6	77.9	80.3	82.7	85.1	87.4	89.7	91.9	93.9
		DC19	29.9	39.1	47.2	54.4	60.9	66.6	71.8	76.4	80.6	84.3	87.7	90.8	93.6	96.1
		DC20	69.8	72.9	75.7	78.1	80.2	81.8	83.0	83.8	84.2	84.2	83.9	83.4	82.7	81.9
		MAN	67.5	70.7	73.8	76.6	79.3	81.8	84.2	86.4	88.4	90.3	92.2	93.9	95.5	97.0
	GP	DC42	78.9	79.9	80.9	81.9	82.8	83.7	84.6	85.5	86.3	87.1	87.9	88.7	89.5	90.2
		DC48	54.8	64.9	73.4	80.4	86.1	90.4	93.4	95.3	96.2	96.1	95.1	93.4	91.0	88.2
		EKU	67.4	70.6	73.6	76.5	79.1	81.5	83.8	85.9	87.9	89.7	91.4	93.0	94.5	96.0
		JHB	97.9	97.4	96.8	96.3	95.8	95.2	94.7	94.1	93.5	92.9	92.3	91.7	91.0	90.4
		TSH	90.1	91.2	92.2	93.1	93.9	94.5	95.0	95.1	95.1	94.8	94.3	93.7	92.9	92.1
	KZ	DC21	69.8	74.2	78.1	81.6	84.5	87.0	89.0	90.6	91.9	92.8	93.5	94.1	94.5	94.9
		DC22	92.7	91.9	91.1	90.4	89.8	89.4	89.3	89.5	89.9	90.6	91.5	92.5	93.6	94.6
		DC23	62.7	69.0	74.5	79.1	82.9	85.9	88.3	90.0	91.2	92.0	92.5	92.7	92.7	92.7
		DC24	83.0	82.6	82.3	82.2	82.3	82.7	83.6	84.8	86.4	88.3	90.3	92.4	94.5	96.4
		DC25	65.4	71.7	77.2	81.8	85.6	88.7	91.1	92.9	94.2	95.1	95.7	96.1	96.3	96.5
		DC26	67.7	69.8	71.8	73.7	75.5	77.3	79.0	80.6	82.1	83.6	85.1	86.4	87.7	89.0
		DC27	72.7	75.4	77.9	80.2	82.3	84.2	85.9	87.4	88.8	90.0	91.1	92.1	93.0	93.9
		DC28	56.4	60.1	63.6	66.8	69.8	72.7	75.4	77.9	80.2	82.5	84.6	86.6	88.4	90.2
		DC29	61.4	68.4	74.3	79.3	83.4	86.7	89.3	91.2	92.6	93.5	94.1	94.4	94.6	94.8
DC43		64.1	67.7	71.1	74.2	77.1	79.8	82.4	84.8	87.0	89.1	91.0	92.9	94.6	96.2	
ETH	90.0	90.7	91.3	91.8	92.3	92.6	92.9	93.0	93.0	92.9	92.7	92.4	92.1	91.7		
LP	DC33	53.6	58.0	62.1	65.9	69.5	72.7	75.8	78.7	81.3	83.8	86.1	88.3	90.3	92.2	
	DC34	63.4	67.1	70.5	73.7	76.7	79.5	82.1	84.5	86.7	88.9	90.9	92.7	94.5	96.1	
	DC35	45.1	53.5	60.7	66.6	71.4	75.1	77.8	79.6	80.6	81.0	80.7	80.1	79.1	78.0	
	DC36	51.5	57.0	62.0	66.6	70.8	74.7	78.2	81.5	84.5	87.2	89.8	92.1	94.3	96.3	
	DC47	56.6	61.7	66.3	70.4	74.0	77.2	80.0	82.5	84.6	86.5	88.1	89.6	91.0	92.3	
MP	DC30	35.5	44.0	51.6	58.3	64.3	69.7	74.6	78.9	82.8	86.3	89.5	92.4	95.1	97.5	
	DC31	58.6	62.5	66.1	69.5	72.6	75.6	78.3	80.9	83.3	85.5	87.6	89.6	91.5	93.2	
	DC32	54.1	58.1	61.7	65.1	68.3	71.4	74.2	76.8	79.3	81.7	83.9	85.9	87.9	89.7	
NC	DC6	74.8	79.8	84.2	88.1	91.4	93.9	95.8	96.9	97.4	97.3	96.7	95.7	94.6	93.3	
	DC7	69.7	73.2	76.4	79.3	82.1	84.6	86.9	89.0	90.9	92.8	94.4	96.0	97.5	98.8	
	DC8	84.0	85.1	86.2	87.2	88.2	89.2	90.2	91.1	92.0	92.9	93.7	94.5	95.3	96.1	
	DC9	83.8	84.8	85.7	86.6	87.5	88.3	89.1	89.9	90.7	91.5	92.2	93.0	93.7	94.4	
	DC45	57.3	59.4	61.5	63.7	65.9	68.3	71.0	74.0	77.1	80.4	83.7	86.9	89.9	92.7	
NW	DC37	32.0	42.2	51.0	58.6	65.1	70.5	75.0	78.6	81.6	84.0	86.0	87.7	89.1	90.5	
	DC38	58.8	64.5	69.6	74.1	78.0	81.2	83.8	85.8	87.3	88.3	89.0	89.4	89.6	89.8	
	DC39	61.3	64.4	67.3	70.1	72.7	75.2	77.5	79.7	81.8	83.8	85.7	87.4	89.1	90.7	
	DC40	74.5	76.9	79.1	81.2	83.2	85.1	86.9	88.7	90.4	92.0	93.5	95.0	96.4	97.7	
WC	CPT	99.4	99.2	99.0	98.8	98.6	98.4	98.3	98.3	98.2	98.3	98.3	98.4	98.6	98.7	
	DC1	96.1	96.4	96.7	97.0	97.3	97.6	97.9	98.1	98.4	98.7	99.0	99.2	99.5	99.8	
	DC2	98.1	98.2	98.2	98.3	98.3	98.4	98.4	98.5	98.5	98.6	98.6	98.6	98.7	98.7	
	DC3	98.3	98.5	98.6	98.7	98.8	98.9	98.9	99.0	99.0	99.0	99.0	99.0	99.0	99.0	
	DC4	95.8	96.3	96.9	97.3	97.8	98.1	98.4	98.5	98.6	98.5	98.4	98.2	97.9	97.6	
	DC5	74.6	77.3	79.7	82.0	84.1	86.0	87.7	89.2	90.7	91.9	93.1	94.3	95.3	96.3	





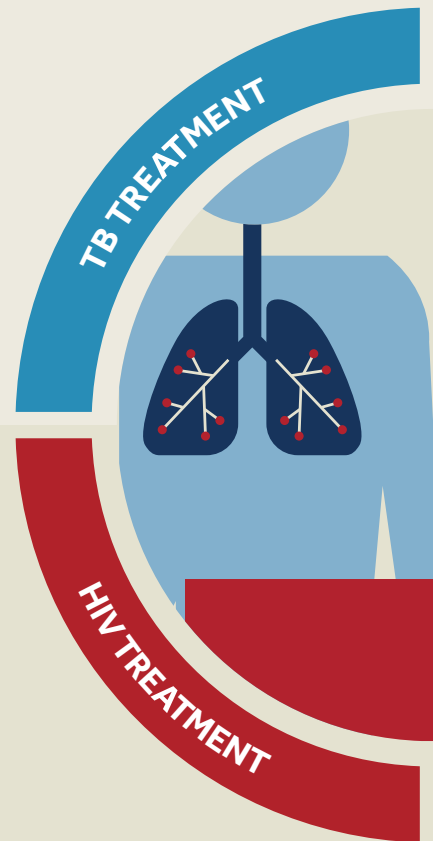
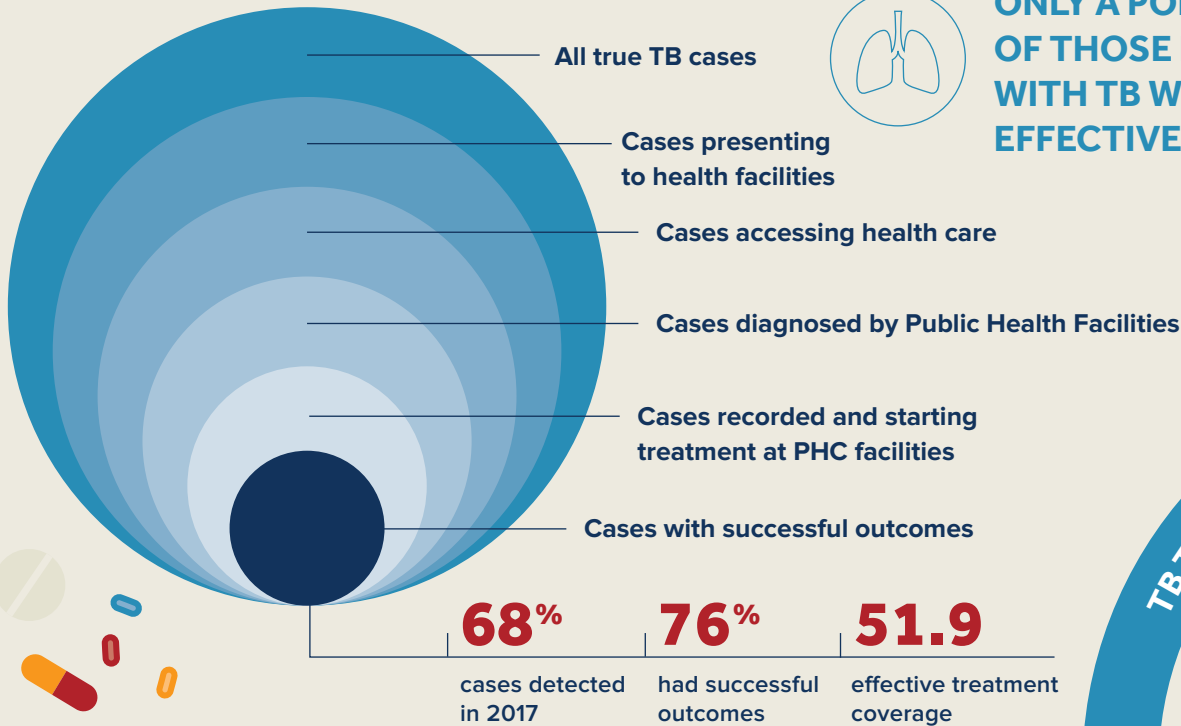
Infectious diseases

UHC 5 TUBERCULOSIS EFFECTIVE TREATMENT COVERAGE

This indicator has been calculated using the globally reported national case detection rate and the drug-sensitive TB treatment success rate.



ONLY A PORTION OF THOSE INFECTED WITH TB WILL RECEIVE EFFECTIVE TREATMENT



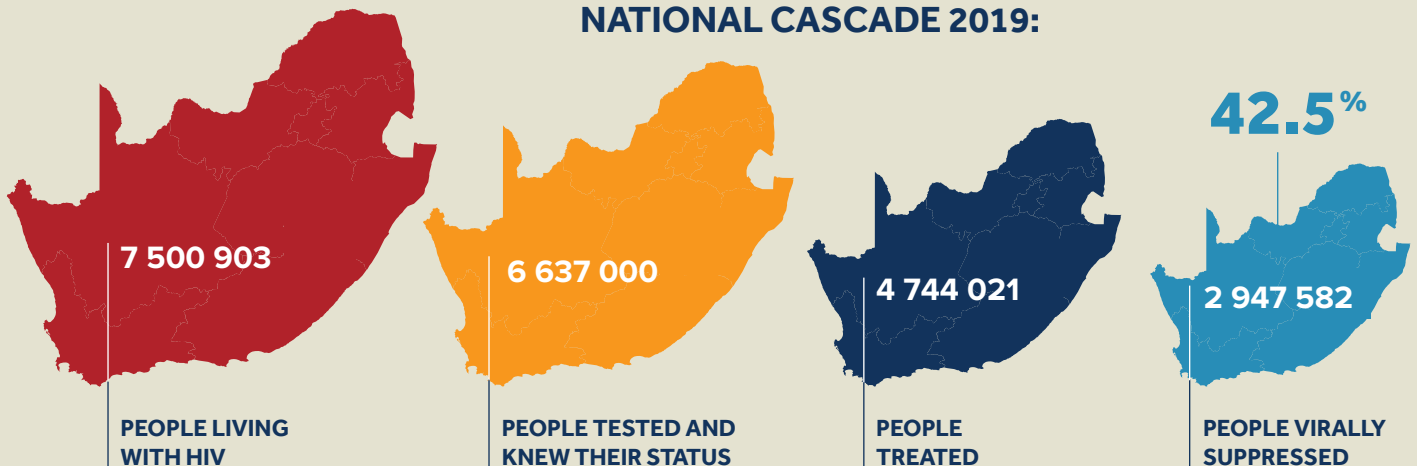
UHC 6 ANTIRETROVIRAL EFFECTIVE COVERAGE (PLHIV ON ART AND VIRALLY SUPPRESSED)

HIV-related indicators recorded worldwide are linked to the concept of a cascade of care that is promoted by the joint UN programme, UNAIDS.



THERE HAS BEEN STRIKING IMPROVEMENT IN THE TREATMENT COVERAGE AND EFFECTIVE COVERAGE OVER TIME

NATIONAL CASCADE 2019:





Indicator insights

South Africa has the largest national ART programme and has invested vast resources into HIV treatment, which has resulted in striking improvements in treatment coverage. Analysis of TB outcome data is complicated by the cohort approach used in reporting, which is defined by the time when treatment was initiated for the cohort.

UHC 7 % OF PEOPLE AT RISK WHO SLEEP UNDER INSECTICIDE-TREATED NETS

This measure is not tracked in South Africa as insecticide-treated bednets are not routinely provided to populations at risk in the three affected provinces.

PROVINCES AT RISK OF MALARIA:



UHC 8 % OF HOUSEHOLDS WITH ACCESS TO IMPROVED SANITATION

The assumption is that there is a positive correlation between access to improved sanitation and decreased risk of diarrhoeal disease.



PROGRESS HAS BEEN MADE BUT THERE ARE LARGE DISPARITIES BETWEEN PROVINCES

IMPROVED SANITATION IS DEFINED AS ACCESS TO:



A flush toilet



A ventilated pit latrine

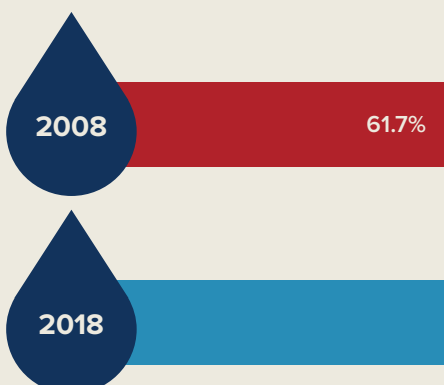


A pit latrine with slab



A composting toilet

SOUTH AFRICA



THE GREATEST DISPARITY EXISTS BETWEEN:

Eastern Cape
58.9%

Western Cape
93.8%

Infectious diseases

The second group of indicators included in the UHC service coverage index deals with infectious diseases and their determinants (tuberculosis, HIV, malaria and sanitation).

UHC5: TB treatment

The fifth indicator is the tuberculosis (TB) effective treatment coverage, on a scale of 0-100. This is an effective service coverage indicator, combining the case detection rate and the treatment success rate. However, the case detection rate requires an estimate of the number of incident infections, including those not detected by the health system. In South Africa, there is only a national estimate of the case detection rate (68%), based largely on expert opinion.²⁷ Sub-national modelling efforts have recently been published as part of the South African National TB Think Tank.²⁸ By contrast, the treatment success rate is available from the routine electronic TB register, for drug-sensitive TB (76.3% in 2017). Separate estimates are available for drug-resistant TB from a different register. Due to the challenges in combining data from the separate treatment cohorts (sensitive, multi-drug resistant and extensively drug resistant) with varying treatment outcome time periods, this indicator has been calculated using the globally reported national case detection rate and the drug-sensitive TB treatment success rate (Figure 9).

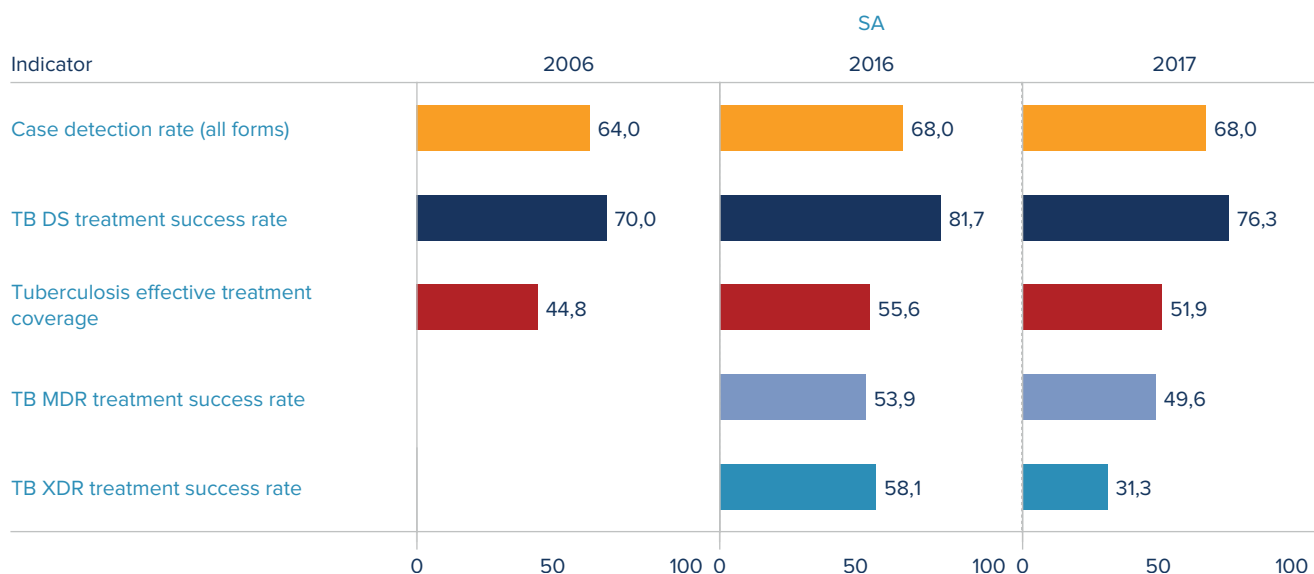
Table 6 shows a heatmap of national and provincial values for the effective coverage indicator, over time, based only on

drug-sensitive TB. The relative lack of progress in improving TB treatment over a sustained period, from 2006 to 2017, is clearly demonstrated.

Combining TB register, laboratory data and published studies, a treatment success rate of 53% was estimated for drug-sensitive TB in South Africa, which was similar for those with and without HIV co-infection.²⁹ For rifampicin-resistant cases, a success rate of only 22% was estimated. Gaps were demonstrated at all levels of the care continuum, as expected.³⁰

One of the key recommendations of the Lancet Commission on Tuberculosis, published in 2019, was to establish accountability mechanisms for TB control, such as national tuberculosis report cards.³¹ The development of such report cards requires attention to patient pathway analyses, to document and measure the cascade of care at national and sub-national levels. The indicator included in the South African UHC service coverage index covers only a portion of that cascade, and only for drug-sensitive TB. The Commission was ambitious in its future vision, claiming that “In the near future, big data aggregated from routine Ministry of Health reports, donor-agency operating plans, private health systems, and social media, as well as other sectors of government, will help transform the efficiency of tuberculosis programmes, enabling targeted scale up of services and providing unprecedented situational awareness and analytic capability to Ministers of Health and national tuberculosis programmes managers.” Using the Lancet Global Health Commission on High Quality Health Systems framework, measures of TB care quality that are not currently measured in routine systems have been identified.³² These missing indicators include measures of the clinical competence of TB care providers, the quality of the user experience, patient satisfaction and TB morbidity. The last of these falls within the ambit of patient reported outcome measures (PROMs), a

Figure 9: Tuberculosis effective coverage and component indicators for calculating the index



growing area of research. Data sources for such indicators are poorly developed; competence for example can be assessed through direct observation or standardised-patient methods. Documenting PROMs requires patient/client exit interviews or population surveys.

Analysis of TB outcome data at a point in time is complicated by the cohort approach used in reporting such data, which is defined by the time when the cohort was initiated on treatment. Treatment success or failure can therefore occur at very different times for drug-sensitive and drug-resistant TB, or for those on short or long regimens for the latter. An alternative, which would allow for the aggregation of outcome data for sensitive and resistant TB and simplified reporting in a time series, would be to define the cohort by the end date of treatment rather than the start date.

Alternative approaches to estimating TB incidence have been employed. For example, the GBD 2016 estimates relied on a statistical triangulation approach, using Bayesian meta-regression, rather than relying on case detection rates informed by expert opinion.³³ The WHO Global Tuberculosis Report 2018 underscored the need for direct measurement: “estimates of the level of and trends in TB disease burden should be based on direct measurements from routine surveillance and surveys as much as possible, as opposed to indirect estimates that rely on modelling and expert opinion”.³⁴ Specifically in relation to South Africa, WHO noted that “TB incidence will be reassessed when the results from the national TB prevalence survey 2018–2019 become available”.²⁷

UHC6: HIV treatment

The concept of a cascade of care is well-developed in relation to HIV, with wide adoption of the 90-90-90 targets, promoted by the joint UN programme, UNAIDS.³⁵ It is therefore surprising that the initial indicator for the UHC service coverage index in Hogan *et al.* was the percentage of people with HIV receiving antiretroviral therapy (ART), a simple service coverage indicator. An obvious effective service coverage indicator would be the percentage of people with HIV receiving ART and virally suppressed. Nonetheless, the ART treatment coverage element is routinely reported at the global level, with national estimates for each country, including by the Global Burden of Disease Study.³⁶

The GBD 2017 report analysed South African data at a sub-national level. At the national level, it estimated that 72% of females and 56% of males living with HIV were on ART. The effective coverage measure, the percentage of people living with HIV who access ART and are virally suppressed, is available from DHIS, which relies on inputs from the electronic HIV register (Tier.net). These data largely exclude the private sector at this time. The most comprehensive time series of data for this alternative indicator to provincial level is accessible from the ‘bespoke’ HIV epidemic model, Thembisa, maintained by the Centre for Infectious Disease Epidemiology and Research, University of Cape Town.³⁷ The Thembisa model incorporates private sector data and also takes under-reporting into account.

Table 6: Tuberculosis effective treatment coverage (drug-sensitive), 2006-2017

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
National	44.8	44.7	50.6	52.8	51.7	56.6	51.8	53.0	52.5	55.1	55.6	51.9
EC	44.3	45.3	51.1	52.5	52.0	54.4	48.9	52.4	51.8	56.1	56.6	52.4
FS	47.1	47.9	51.5	52.5	52.5	55.0	49.8	52.2	53.1	54.4	54.5	48.1
GP	47.0	48.3	54.0	56.6	57.4	60.5	55.6	56.2	56.7	57.7	57.4	50.7
KZ	41.9	41.2	48.3	51.4	53.8	56.9	53.3	55.6	50.2	56.3	56.4	49.8
LP	39.8	41.4	45.8	48.0	47.1	49.3	43.9	39.1	48.8	51.7	54.8	55.2
MP	39.0	42.9	49.2	49.2	28.6	56.7	50.6	51.7	57.1	55.3	55.9	54.6
NC	47.0	45.0	54.1	56.1	53.7	54.2	50.4	48.8	48.4	48.8	52.4	52.4
NW	40.0	39.8	41.3	47.5	49.0	50.8	45.2	44.8	47.7	46.9	53.3	53.6
WC	49.4	51.5	56.7	58.5	59.6	61.1	55.4	56.2	55.7	54.7	54.6	53.7



As befits the world's largest national ART programme, with considerable resources invested in monitoring and evaluation, there are a number of other measures of importance to quality of care that have been captured. Molapo *et al.* have described the estimation of the number of people living with HIV (PLHIV) per district, a key denominator for monitoring the HIV treatment cascade.³⁸ These denominators have subsequently been updated and incorporated as semi-permanent data elements in DHIS. A key number tracked by the ART programme is the total number living with HIV and retained on ART (referred to as TROA). In the quarter 1 of 2019 DHIS data, there were estimated to be 7 500 903 South African residents living with HIV, of whom 6 637 004 knew their status, 4 744 021 were on ART (the TROA figure), 3 326 428 had a viral load determination done in the preceding 12 months, and 2 947 582 were virally suppressed. In other words, 42.5% of those living with HIV were virally suppressed on treatment. This figure could be disaggregated by age, showing that while 43.5% of adults (15 years and older) were virally suppressed, only 20.6% of children (0-14 years) were similarly controlled.

Table 7 shows the striking improvement in the modelled treatment coverage and effective coverage over time, with the time series extending back to before the national ARV program was rolled out.

The contrast between the 2nd and 3rd 90 measures is best portrayed in Figure 10, which shows the global and national sources of data, and how they have varied over time. The HIV viral load suppression ('3rd 90') is the target measure based on the cohort on ART. The effective coverage measure (using the denominator of all PLHIV) shows the overall impact of the losses incurred at each step of the cascade.

Figure 11 shows the estimates for 2016, 2017 and 2018, from the DHIS and Thembisa 4.2, together with the 2017 estimate from the UNAIDS Global Report. The provincial estimates from Thembisa for the most recent year are in a relatively narrow range from 49.2% (North West) to 64.8% (Mpumalanga). Nationally, there is some evidence of improved performance, from 46.9% in 2017 to 59.2% in 2019. As expected, DHIS-reported figures are somewhat lower, but the globally-reported figure (47% in 2017) is not out of range.

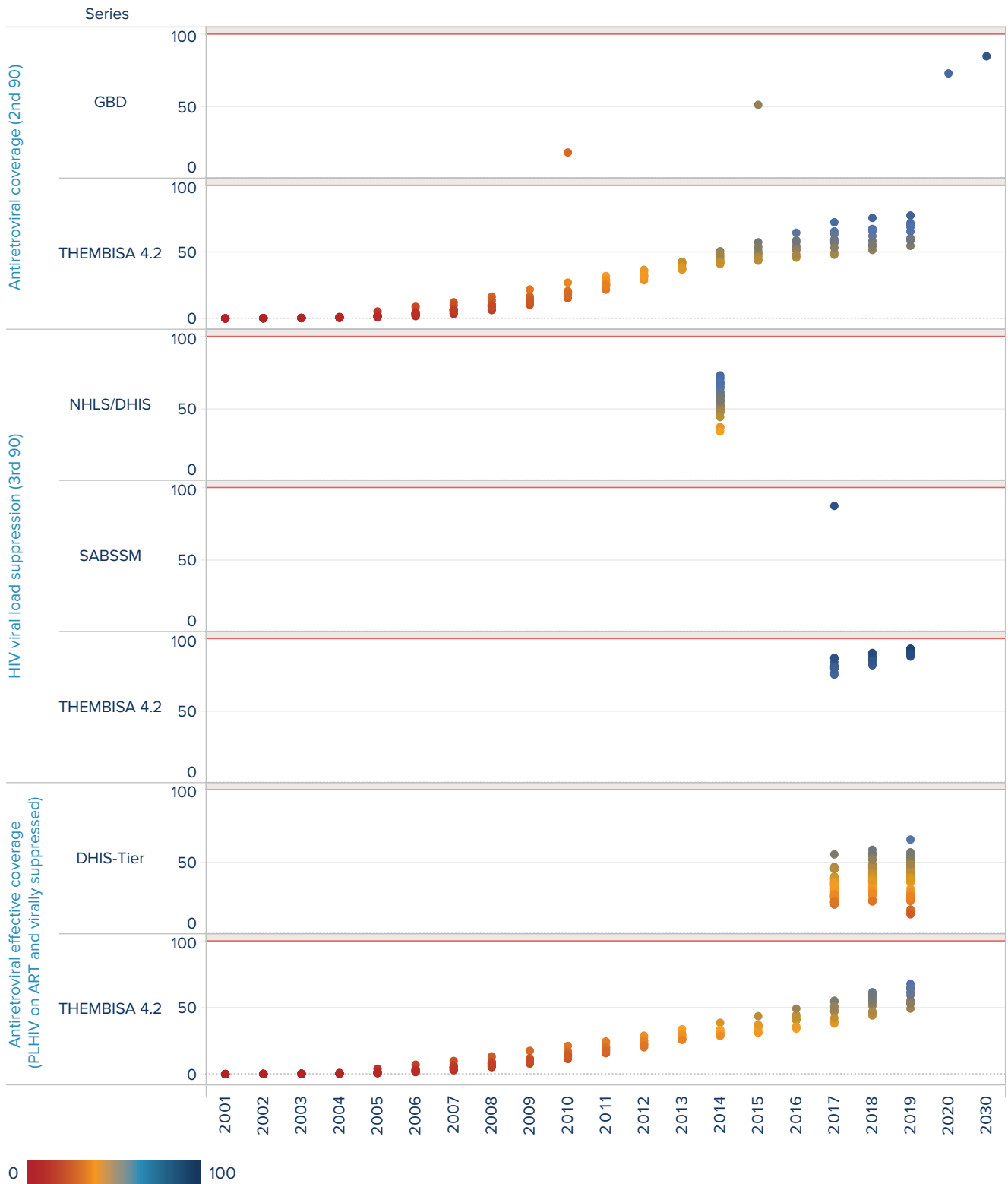
Figure 12 shows the ART effective coverage (PLHIV treated, and virally suppressed), disaggregated by province, but also by age, for the past three years, as drawn from the DHIS (and in turn from Tier.net). The data are shown for those aged 14 years and younger (children), 15 years and older (generally regarded as adults) and for all ages. The differential in the proportion of adults and children virally suppressed is evident for all provinces, except for the Northern Cape and Western Cape.

Table 7: Modelled ART coverage (PLHIV on ART) and effective coverage (PLHIV virally suppressed), 2001 to 2019

		THEMBISA 4.2																		
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Antiretroviral coverage (2nd 90)	National	0.2	0.4	0.5	1.0	2.1	3.8	6.6	10.0	14.4	20.1	27.5	34.4	40.9	45.8	49.4	53.3	57.7	61.9	65.3
	EC	0.2	0.4	0.6	1.0	2.1	3.6	5.8	8.9	12.8	18.0	24.8	31.2	37.5	41.7	44.2	48.0	53.1	55.5	58.6
	FS	0.2	0.3	0.4	0.7	1.1	1.9	3.6	6.4	11.5	17.7	25.1	31.5	37.3	42.1	46.1	51.6	59.1	65.5	68.6
	GP	0.2	0.4	0.6	1.1	2.5	4.4	7.1	10.3	14.2	19.2	25.7	32.3	38.8	42.2	43.9	45.7	47.9	54.2	59.3
	KZ	0.2	0.4	0.6	1.0	1.8	3.4	6.4	10.0	14.4	20.5	28.9	36.1	42.5	48.4	53.7	58.7	63.5	67.0	69.4
	LP	0.1	0.3	0.4	0.7	1.5	2.8	5.4	9.1	14.0	20.4	28.7	35.7	41.9	47.1	51.3	57.2	65.3	67.2	69.5
	MP	0.2	0.3	0.5	0.8	1.3	2.3	4.4	7.0	10.4	15.3	21.7	28.8	36.7	43.4	49.1	54.3	59.3	66.5	71.6
	NC	0.2	0.3	0.5	0.9	2.3	4.9	10.0	13.6	16.5	20.4	25.3	32.6	42.5	50.5	57.2	64.3	72.1	75.4	77.2
	NW	0.1	0.2	0.4	0.7	1.7	3.5	6.6	10.4	14.4	19.6	25.7	31.4	37.1	40.9	43.4	46.2	49.3	51.4	54.5
	WC	0.2	0.3	0.5	1.3	5.4	8.9	12.3	16.5	21.9	27.0	31.9	36.6	41.1	44.5	47.6	51.6	56.6	58.2	60.3
Antiretroviral effective coverage (PLHIV on ART and virally suppressed)	National	0.1	0.3	0.4	0.7	1.6	3.0	5.2	7.9	11.1	15.2	20.2	24.8	29.2	32.8	36.2	40.9	46.9	53.4	59.2
	EC	0.2	0.3	0.4	0.8	1.5	2.7	4.5	6.8	9.6	13.2	17.6	21.7	25.8	28.8	31.3	35.7	42.1	47.1	52.6
	FS	0.1	0.2	0.4	0.6	0.9	1.7	3.1	5.5	9.7	14.6	20.3	25.1	29.4	33.3	37.0	42.8	51.0	58.8	63.8
	GP	0.1	0.3	0.4	0.8	1.9	3.4	5.5	7.9	10.6	14.0	18.3	22.6	26.8	29.3	31.2	34.1	38.0	46.0	53.4
	KZ	0.2	0.3	0.5	0.8	1.5	2.9	5.5	8.5	12.1	17.0	23.5	28.9	33.7	38.6	43.5	49.1	55.1	60.4	64.6
	LP	0.1	0.2	0.3	0.5	1.0	2.1	4.0	6.6	9.9	14.0	19.2	23.3	27.0	30.5	34.2	40.5	49.9	55.4	61.3
	MP	0.1	0.3	0.4	0.6	1.0	1.8	3.4	5.4	8.0	11.4	15.8	20.6	26.0	30.8	35.6	41.3	47.8	57.1	64.8
	NC	0.1	0.2	0.3	0.6	1.6	3.4	7.0	9.4	11.1	13.3	16.0	20.2	26.2	31.5	37.0	44.4	54.1	61.5	67.7
	NW	0.1	0.2	0.3	0.6	1.3	2.7	5.2	8.1	11.0	14.6	18.7	22.4	26.1	28.9	31.4	35.0	39.6	44.0	49.2
	WC	0.2	0.3	0.4	1.0	4.2	7.2	10.0	13.4	17.6	21.3	24.6	27.7	30.7	33.4	36.4	41.0	47.3	51.1	55.3



Figure 10: Range of ART coverage indicators, 2001 to 2019, and projections to 2030



Routine laboratory data have the potential to provide critical insights into the extent of viral suppression, which in turn is a key determinant of HIV transmission. A study in Khayelitsha showed that more tests were done than were noted in patient records; while 84% of viral load determinations were actually performed, only 79% had the results filed, 76% were noted and 55% were captured in the electronic health record.³⁹ An earlier (2014-2015) national analysis of the data from the National Health Laboratory Service (NHLS) database noted challenges with linking data systems.⁴⁰ For example, the authors stated that “linking the data is difficult because the NHLS and Department of Health (DOH) use separate lists of health facility names and identifications, and the NHLS test data are not automatically linked to the patient data

stored in the DHIS”. Structurally, the “NHLS database is a database of tests, not persons, and—given that a person can test more than once and via different health facilities—there is a disconnect between data systems”. Of particular concern, this study showed that the gap between the percentage of patients virally suppressed in the best- and worst-performing provinces was 13%. Between districts, the differential was even larger – 39%. Between individual facilities, the figure ranged from as high as 96% to as low as 20%.

A study conducted in two districts, uMkhanyakude and Tshwane, has shown how routine laboratory data can be used in near real-time, to track the performance of an ART programme in children relatively inexpensively.⁴¹

Figure 11: Comparison of ART effective coverage by source, national and provincial

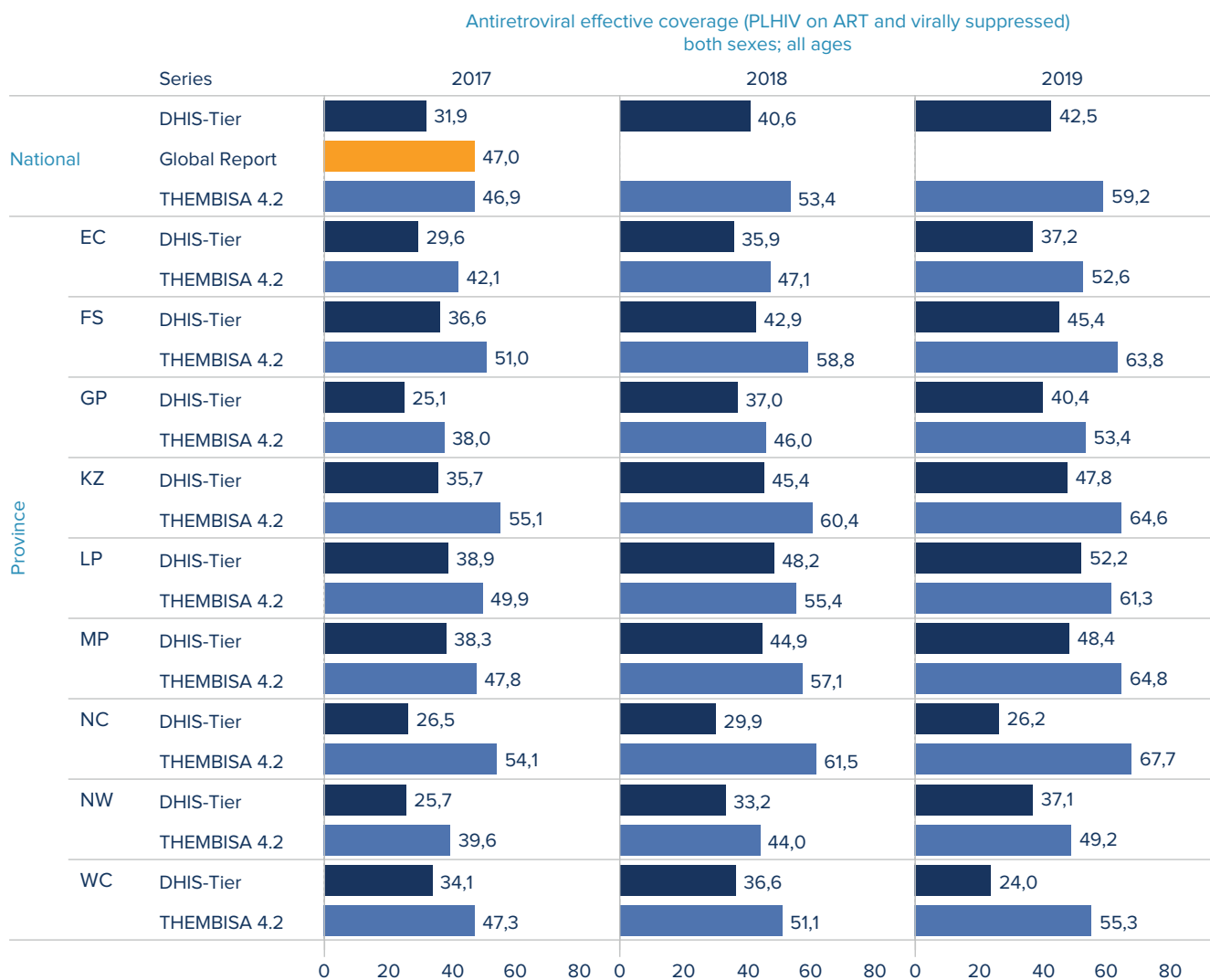


Figure 12: ART effective coverage by age group, national and provincial



UHC7: Malaria prevention

The third infectious disease indicator is focused on malaria prevention, and measures the percentage of the population at risk who sleep under insecticide-treated bednets. This service coverage indicator cannot be tracked in South Africa as insecticide-treated bednets are not routinely provided to populations at risk in the three affected provinces (Limpopo, Mpumalanga, KwaZulu-Natal). The low incidence and prevalence of malaria in South Africa as a whole has been noted in the recent report of the Lancet Commission on Malaria.⁴²

UHC8: Water and sanitation

The final infectious disease indicator is the percentage of households with access to basic sanitation. In South Africa, periodic Stats SA surveys (Census, the intercensal Community

Survey and annual General Household Survey) report on the percentage of households with access to improved sanitation, defined as a flush toilet (whether connected to piped sewers, a septic tank or a pit latrine), a ventilated improved pit latrine, a pit latrine with a slab, or a composting toilet. The assumption, borne out by statistical analysis, is that there is a positive correlation between access to improved sanitation and decreased risk of diarrhoeal disease. As the General Household Survey only reports at the level of provinces, not districts, disaggregation to the lower level has only been possible in years when a Census or Community Survey has been conducted. The heatmap in Table 8 shows the progress over time, across provinces and districts, for the different sources. The most recent General Household Survey (2018) pointed out that progress has stalled, with the final 20% proving to be the most difficult.⁴³ The specific indicator tracked was only reported every second year. Provincially, the greatest gains have been in the Eastern Cape and Limpopo. In the Eastern Cape, the percentage of households with access to improved sanitation increased from 33.4% in 2002 to 88.0% in 2018. By contrast, the national figure increased from 61.7% in 2002 to 83.0% in 2018. The range of improvement over time is shown in Figure 13.

Figure 13: Range of access to improved sanitation, 2001 to 2018

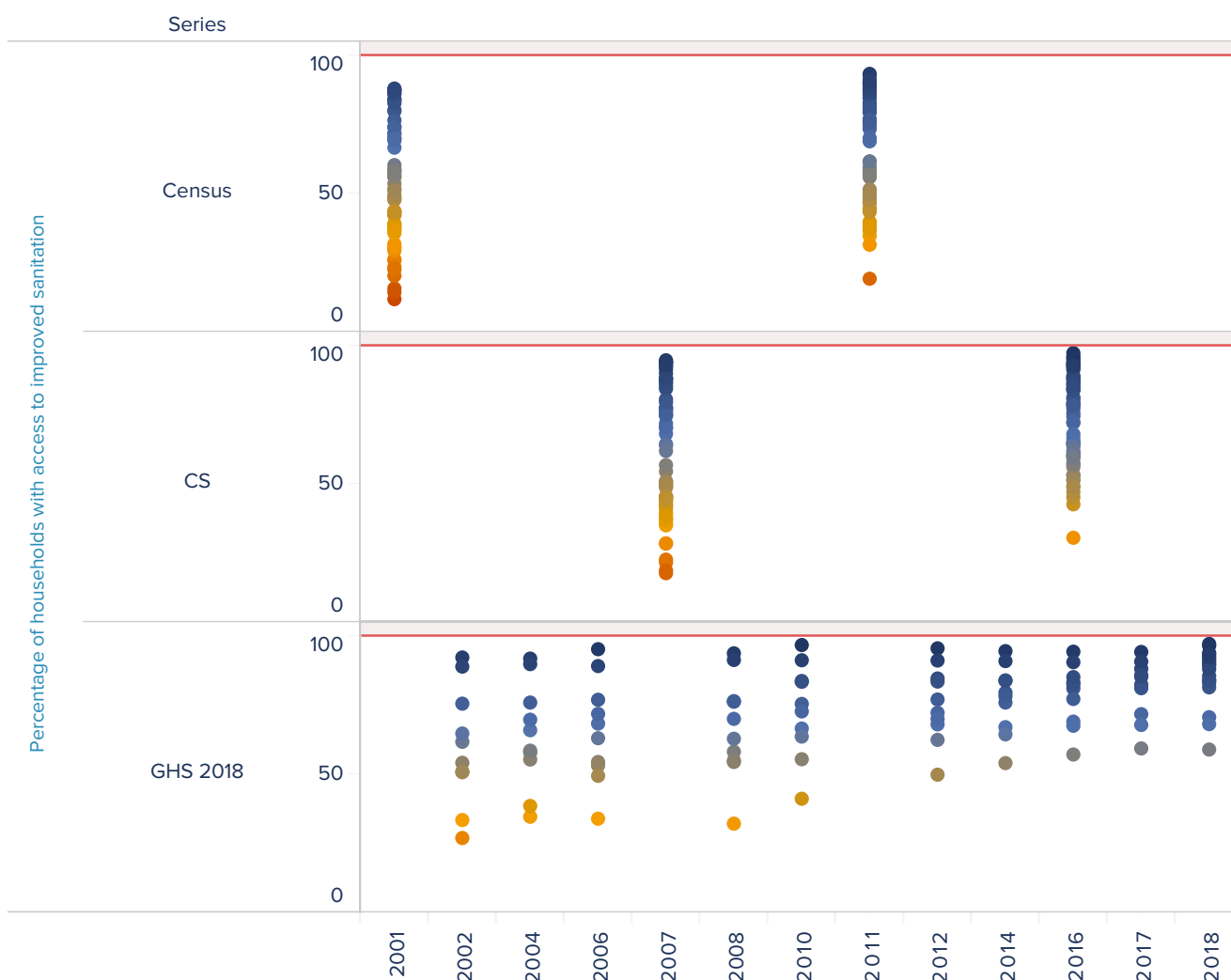


Table 8: Percentage of households with access to improved sanitation, 2001 to 2018, national, provincial and district

		2001	2002	2004	2006	2007	2008	2010	2011	2012	2014	2016	2017	2018	
		Census	GHS 2018	GHS 2018	GHS 2018	CS	GHS 2018	GHS 2018	Census	GHS 2018	GHS 2018	CS	GHS 2018	GHS 2018	
National		58,5	61,7	65,9	68,3	64,4	70,0	75,4	68,9	77,0	79,5	75,6	81,0	83,0	
Province	EC	38,8	33,4	38,5	49,4	45,3	54,9	63,6	56,8	70,0	78,2	74,4	85,1	85,8	88,0
	FS	53,6	64,7	69,7	71,8	68,1	76,4	83,4	75,6	83,5	83,8	79,0	83,2	85,2	85,5
	GP	83,6	88,9	89,8	89,1	86,9	91,3	91,2	87,8	91,1	90,9	88,5	90,5	90,7	91,8
	KZ	51,6	50,9	58,5	63,0	56,8	62,8	72,7	59,6	68,0	75,9	65,1	77,2	81,1	81,4
	LP	26,2	26,9	34,6	33,9	28,4	32,1	41,1	37,0	49,8	54,0	51,5	57,1	59,3	58,9
	MP	48,2	50,7	55,3	53,1	54,5	54,4	55,4	55,9	62,4	64,4	60,4	67,5	67,8	68,1
	NC	71,9	75,5	75,9	76,9	80,6	76,2	83,7	74,7	84,6	83,9	78,6	82,6	88,1	90,0
	NW	47,7	54,1	57,8	54,4	50,9	58,1	66,5	56,9	72,2	67,0	64,6	69,0	71,7	70,6
	WC	87,1	92,2	91,8	95,2	92,6	93,7	96,7	90,1	95,5	94,5	93,5	94,3	94,2	93,8
District	EC BUF	43,3				44,4			76,8			85,7		93,4	
	DC10	56,2				77,3			76,9			83,9			
	DC12	43,3				44,4			31,5			59,9			
	DC13	30,9				38,5			49,9			62,0			
	DC14	22,5				41,1			47,7			63,7			
	DC15	14,3				18,7			38,1			61,3			
	DC44	11,8				21,6			34,7			72,1			
	NMA	80,2				88,0			89,8			93,3		97,1	
	FS DC16	69,2				76,2			84,6			89,1			
	DC18	51,2				70,4			79,5			84,9			
	DC19	36,5				45,4			61,6			68,0			
	DC20	66,6				87,9			82,8			84,1			
	MAN	60,3				70,3			79,5			79,3		89,3	
	GP DC42	84,2				89,9			89,5			92,1			
	DC48	79,8				84,4			85,8			87,8			
	EKU	83,9				86,5			87,0			86,7		90,8	
	JHB	86,4				91,5			92,8			93,6		96,4	
	TSH	74,1				74,6			81,0			81,3		84,0	
	KZ DC21	35,7				37,0			44,0			60,3			
	DC22	56,0				61,9			70,1			66,4			
	DC23	38,3				45,2			56,9			59,3			
	DC24	30,3				39,6			50,0			64,8			
	DC25	58,0				64,0			57,1			72,3			
	DC26	29,4				43,6			43,4			48,8			
	DC27	23,4				42,3			38,9			47,0			
	DC28	39,1				37,1			46,8			57,1			
	DC29	37,7				37,4			46,6			45,1			
	DC43	36,9				42,2			44,6			49,2			
	ETH	71,4				75,2			73,4			77,3		83,9	
	LP DC33	25,8				28,5			37,2			60,2			
	DC34	20,3				22,6			36,6			51,3			
	DC35	31,8				35,0			39,8			53,1			
	DC36	43,3				50,0			57,9			64,1			
DC47	15,7				17,7			19,2			30,5				
MP DC30	58,7				71,8			76,4			80,8				
DC31	49,5				49,1			61,6			64,8				
DC32	42,4				50,8			38,7			42,6				
NC DC6	69,8				79,6			86,4			88,2				
DC7	57,3				75,0			80,7			84,4				
DC8	74,0				77,6			75,9			78,3				
DC9	76,5				85,4			81,5			86,2				
DC45	43,7				49,4			51,5			57,5				
NW DC37	37,3				45,4			48,5			56,1				
DC38	42,2				35,6			44,1			53,2				
DC39	48,7				48,7			58,4			79,1				
DC40	70,1				77,2			90,2			91,3				
WC CPT	87,7				92,8			90,4			92,8		92,4		
DC1	87,2				93,7			88,4			92,6				
DC2	88,0				94,0			91,1			96,0				
DC3	86,0				94,0			89,7			95,5				
DC4	82,7				88,2			87,8			94,5				
DC5	87,4				94,7			93,3			97,3				





Non-communicable diseases

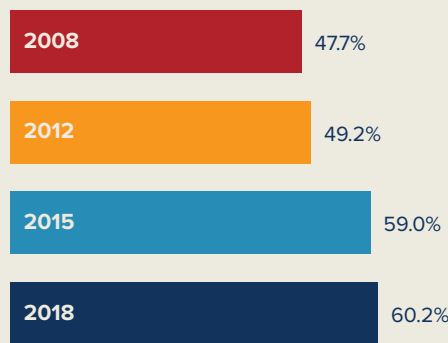
UHC 9 PREVALENCE OF NON-RAISED BLOOD PRESSURE

High blood pressure is defined as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg.



THE INDICATOR HAS INCREASED STEADILY OVER TIME

FROM 2008-2018:



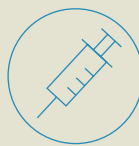
DESPITE INCREASES IN:

-  Waist circumference
-  Alcohol use
-  BMI

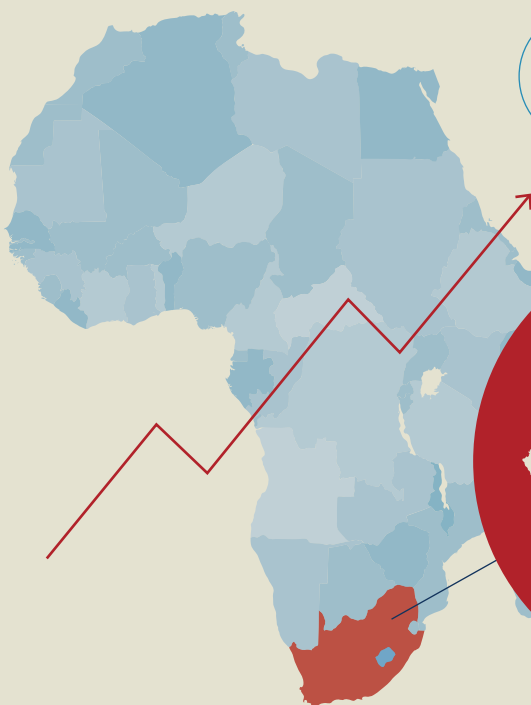


UHC 10 DIABETES TREATMENT COVERAGE

Treatment coverage at district level was estimated using self-reported medication use and a predictive model for being diabetic.



THE INCREASING BURDEN OF DIABETES IS AN AFRICA-WIDE PROBLEM



19.4% of South African diabetics were treated and controlled.

NATIONALLY, DIABETES TREATMENT COVERAGE HAS DECLINED





Indicator insights

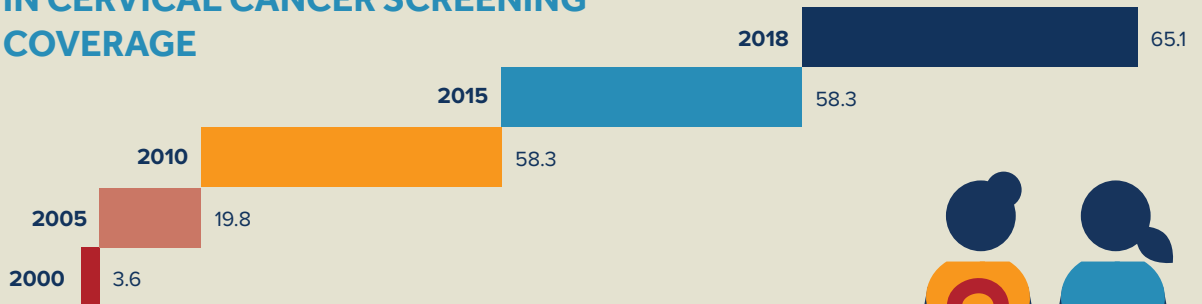
The indicators have been criticised for inadequately addressing disability, but also for being too focused on available data sources. They may also not be the best indicators of chronic conditions and their associated morbidity rather than mortality. Overall, African countries are not on track to meet the NCD targets.

UHC 11 COVERAGE OF CERVICAL CANCER SCREENING IN WOMEN

The indicator is defined at present as the number of cervical screening tests performed as proportion of one-tenth of the female population aged 30 years or older.



CLEAR PROGRESS HAS BEEN MADE IN CERVICAL CANCER SCREENING COVERAGE



SCREENING IS NOW RECOMMENDED:

EVERY 3 YEARS

Among those from age 20 onwards with HIV

EVERY 10 YEARS

Among those from age 30 not living with HIV



UHC 12 PREVALENCE OF NON-SMOKING

The defined indicator is an imperfect proxy measure of effective implementation of tobacco control policies.



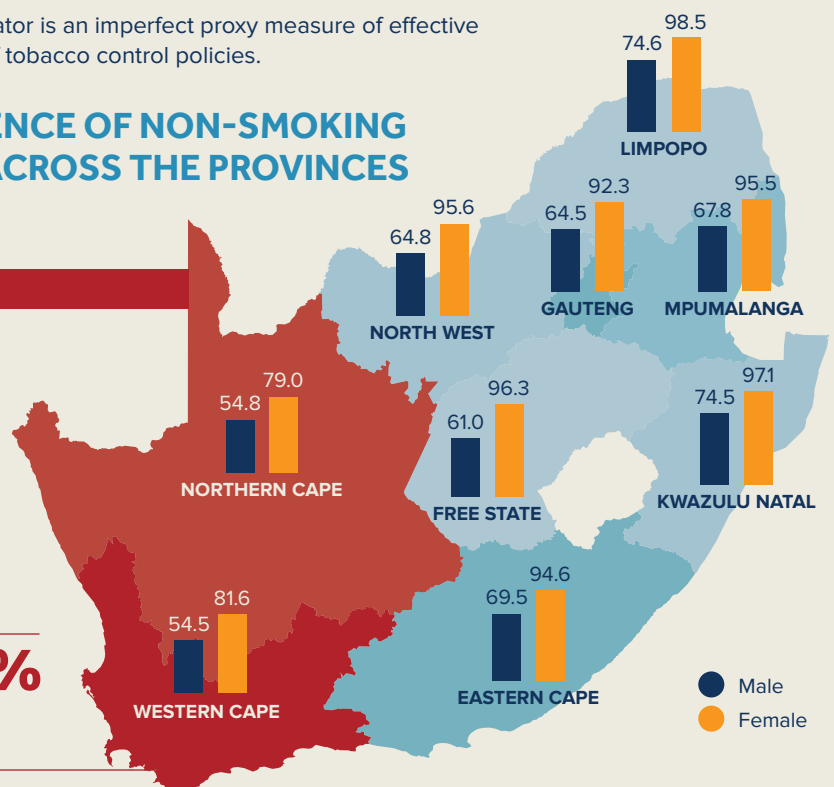
PREVALENCE OF NON-SMOKING VARIES ACROSS THE PROVINCES

IN 2017:

Females in the Northern and Western Cape have a markedly lower prevalence of not smoking than in other provinces.

PREVALENCE BELOW

90%



Male (dark blue circle)
Female (orange circle)

Non-communicable diseases

The most challenging indicators are those that seek to characterise the performance of the health system in relation to non-communicable disease (NCDs). In any country with an aging population, NCDs are an increasingly important component of the burden of disease, and therefore a critical measure of the responsiveness of the healthcare delivery system.⁴⁴ In 2014, a burden of disease analysis, drawing on four national surveys (SADHS 1998, the Study on Global Ageing and Adult Health 2007, and the first two “waves” of NiDS, 2008 and 2010) showed that NCDs were the largest broad cause of years of life lost (YLLs) in South Africa.⁴⁵

The WHO’s Comprehensive Global Monitoring Framework was developed in 2011, and proposed 25 indicators for the prevention and control of four major NCDs - cardiovascular disease, cancer, chronic lung diseases and diabetes.^{46,47} The indicators have been criticised for inadequately addressing disability, but also for being too focused on available data sources, not the best indicators of chronic conditions and their associated morbidity rather than mortality.⁴⁸ Two types of data sources are considered critical to adequately monitoring NCDs – reliable and timely vital registration data (allowing the continuous monitoring of cause-specific mortality) and well-planned and conducted population surveys of the risk factors for NCDs.⁴⁹ An important recent criticism of the ‘silo’ approach to UHC, which could be discerned in the very construct of the UHC service coverage index, has pointed to the fact that African countries are not on track to meet the NCD targets, “driven by an insufficient focus on ecological drivers of NCD risk factors, including poor urban development and the unbridled proliferation of the commercial determinants of health”.⁵⁰ The authors particularly decried the focus on “downstream healthcare service provision to the exclusion of upstream population-level prevention”. Intersectoral attention to the social determinants of health is hardly a new concept, but has been one of the most neglected (and under-measured) aspects of comprehensive Primary Health Care.

UHC9: Prevention of cardiovascular disease

For cardiovascular disease, the WHO Comprehensive Global Monitoring Framework indicator focused on prevention, and thus the risk factor: the age-standardised prevalence of raised blood pressure among persons aged 18 years and older (defined as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg) and mean systolic blood pressure. Population surveys would therefore record patients with hypertension who are controlled on treatment as having non-raised blood pressure. The ninth UHC coverage index reported

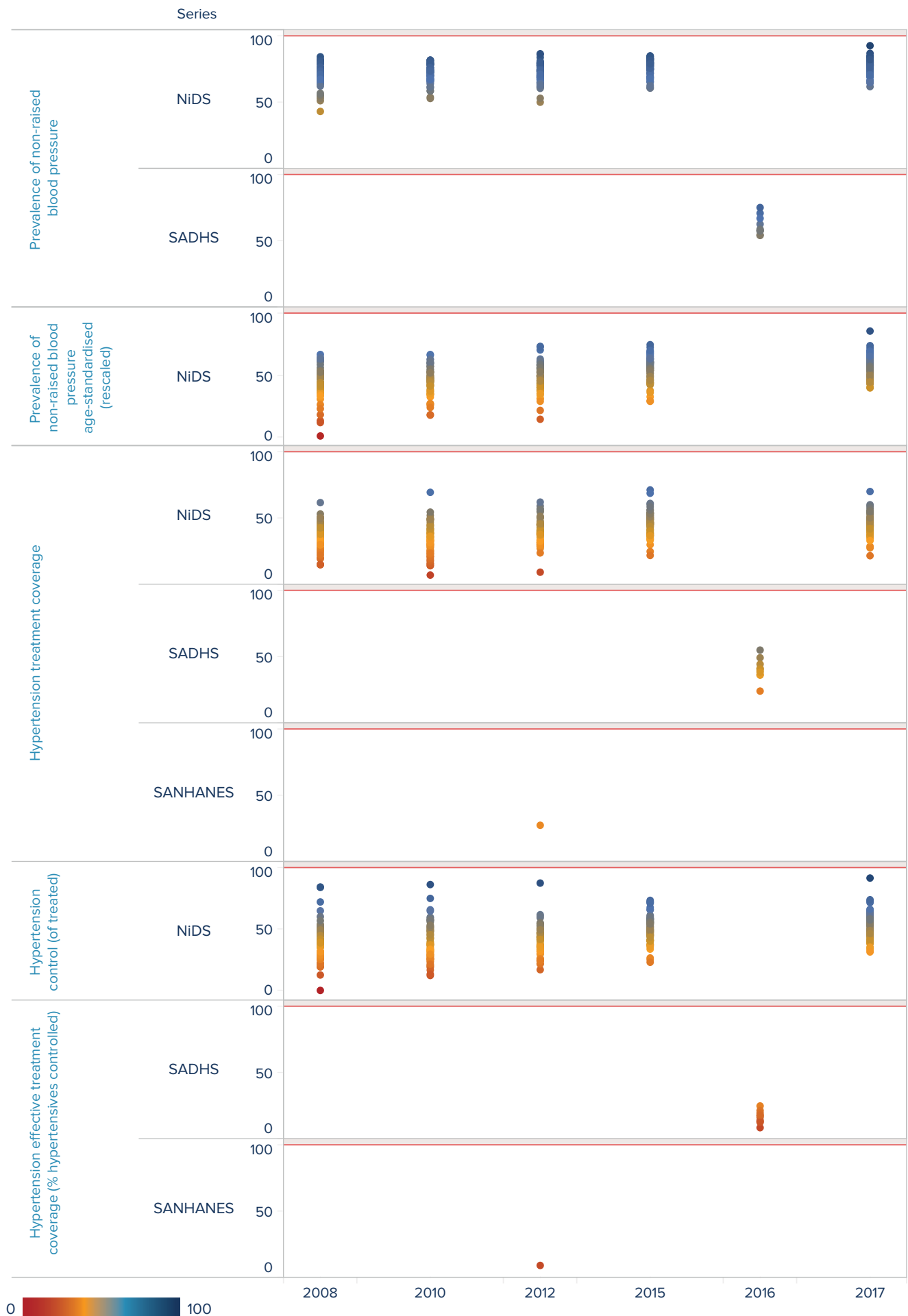
by Hogan et al. is a proxy measure, defined as the prevalence of non-raised blood pressure, regardless of treatment status (expressed as a percentage). A more direct coverage measure would be the percentage of patients with hypertension on treatment, whereas an effective coverage measure would be the percentages of patients with hypertension who are controlled on treatment.

The South African National Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2013 – 2017 has set a target of reducing the prevalence of raised blood pressure (through lifestyle and medication) by 20%. An assessment of the suitability of local data sources for all NCD indicators identified the need for them to be “harmonised and in certain areas strengthened, eliminating gaps and providing a sound basis of data quality, definitions and categories used and timeliness”.⁵¹ Wandai *et al.* pointed to the potential to use the Centralised Chronic Medicine Dispensing and Distribution Programme (CCMDD) as a measure of the number on treatment. However, only an undocumented proportion of patients treated for hypertension in the public sector are supplied through CCMDD, and no measure of control is possible. If the dispensing module of RxSolution, the public sector pharmacy computerised record system, were implemented, those data could be used to determine the number of patients receiving particular antihypertensive medicines. However, without a linked diagnosis, that count might include patients with other cardiovascular conditions, such as heart failure. At a national level, the RSA Pharma database collects data on sales to the provinces of medicines on tender. Those data could be expressed as utilisation in defined daily doses per 1000 inhabitants per day, which would be a proxy measure for the point prevalence of the main indications for those medicines. The defined daily dose is the average dose for the main indication in adults, and is a standard measure defined by the WHO Collaborating Centre for Drug Statistics Methodology (<https://www.whocc.no/>). However, it is important to note how few patients with hypertension are controlled in many settings. A pooled analysis of population survey data from 44 low- and middle-income countries showed that among those with raised blood pressure, only 39.2% had been diagnosed with hypertension, 29.9% received treatment, and 10.3% were controlled.⁵² Even in high-income countries, less than 25% of those on treatment for hypertension were controlled.⁵³

The five waves of NiDS provide the most frequent datasets of blood pressure measurements, and are the only survey source which can be disaggregated to district level. The prevalence of non-raised blood pressure in the adult population (15 years and older), regardless of treatment status, was calculated using the standard thresholds. The prevalence values were age-standardised using Statistics South Africa’s population estimates from Census 2011. The index was rescaled to obtain finer resolution across districts, using the formula: $\text{index} = (\text{original value} - \text{minimum}) / (100 - \text{minimum}) \times 100$.⁵

Figure 14 shows the range of local sources, per province and over time (2008-2017), drawing on SADHS, SANHANES and NiDS. Indicators from these national surveys have been

Figure 14: Range of cardiovascular disease prevention indicators, 2008 to 2017



reported in those aged 15 years and older, not 18. A previous analysis of the first four ‘waves’ had shown that there was evidence of a decline in the prevalence of hypertension in older age groups (perhaps attributable to improved treatment coverage), but raised concerns about potentially paradoxical results in younger participants.⁵⁴ Although treatment effects would be assumed to be absent, there was a decrease in mean systolic and diastolic blood pressures in males and females, despite a simultaneous increase in waist circumference, alcohol use and body mass index (BMI) among females. The current analysis of the five waves shows the corresponding increase in the prevalence of non-raised blood pressure across districts and provinces, with the variability enhanced by the rescaled index (Figure 14 and Table 9).

UHC10: Management of diabetes

The tenth UHC service coverage index indicator reported by Hogan *et al.* is focused on diabetes mellitus, which is a growing component of the global burden of disease.⁵⁵ Danaei *et al.* converted measures of fasting plasma glucose measures, oral glucose tolerance tests or glycosylated haemoglobin to mean fasting plasma glucose, and then fit a Bayesian model to calculate age-sex-year-country specific prevalence. Although that global analysis pointed to a lower increase in prevalence in sub-Saharan Africa than elsewhere (apart from high-income countries), there is evidence of a considerable prevalence of diabetes in some African countries and a large unmet need.⁵⁶ In 12 nationally representative population-based surveys, the prevalence

of diabetes ranged from 2–14% and the prevalence of overweight or obesity ranged from 16–68%. In the Durban Diabetes Study, the age-standardised prevalence of diabetes varied from 11.9% (based on fasting plasma glucose), to 12.9% (based on an oral glucose tolerance test), and 13.1% (based on glycosylated haemoglobin).⁵⁷ Very similar results had previously been shown in Cape Town.⁵⁸ Based on SANHANES 2012 data, Stokes *et al.* showed that 80.6% of the South African diabetic population had unmet care needs, with only 19.4% treated and controlled.⁵⁹ Poor control has also been shown in individual South African districts (Pixley ka Seme and uMgungundlovu).⁶⁰

The National Indicator Data Set includes other measures, such as the counts of clients over the age of 40 years who are screened for diabetes, the count of new diabetes clients aged 40 years and older, and the count of diabetes care visits, which are collected by DHIS. In the private sector, the Council for Medical Schemes reports on the proportion of beneficiaries (per 1000) who are diagnosed and treated for type 2 diabetes mellitus. Nationally representative surveys, however, are agnostic in terms of medical scheme coverage, and so cover both insured and uninsured (public sector dependent) patients.

The UHC service coverage index indicator reported by Hogan *et al.* is calculated from the mean fasting plasma glucose value, which is a proxy for diabetes prevalence and control. The reported index is rescaled using the minimum theoretical biological risk (a plasma glucose of 5.1 mmol/L) and observed maximum across countries. In time, however, the intention is to replace the indicator with one that measures treatment coverage.

Table 9: Age-standardised prevalence of non-raised blood pressure, before and after rescaling, national and provincial

NiDS, 15+ years, both sexes, age-standardised

	Prevalence of non-raised blood pressure age-standardised					Prevalence of non-raised blood pressure age-standardised (rescaled)				
	2008	2010	2012	2015	2017	2008	2010	2012	2015	2017
National	72,8	72,9	73,6	78,7	79,3	47,7	47,9	49,2	59,0	60,2
Province										
EC	70,7	71,9	70,2	76,1	79,5	43,7	46,0	42,7	54,0	60,6
FS	72,5	66,4	74,0	78,1	76,0	47,1	35,4	50,0	57,9	53,8
GP	73,8	71,6	73,6	79,8	80,7	49,6	45,4	49,2	61,2	62,9
KZ	73,1	72,2	73,8	79,3	77,5	48,3	46,5	49,6	60,2	56,7
LP	79,8	79,1	79,4	83,3	82,8	61,2	59,8	60,4	67,9	66,9
MP	71,3	78,8	80,9	80,8	84,4	44,8	59,2	63,3	63,1	70,0
NC	68,2	69,4	70,7	71,0	74,0	38,8	41,2	43,7	44,2	50,0
NW	68,2	76,4	70,8	79,1	79,5	38,8	54,6	43,8	59,8	60,6
WC	69,5	67,8	70,0	76,1	75,5	41,3	38,1	42,3	54,0	52,9

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South African data for the indicator can be obtained from SANHANES 2012 at a national level, and from the five 'waves' of NiDS, the latter allowing for disaggregation to provincial and district levels. In order to generate local estimates of diabetes prevalence, a machine learning model was trained with SADHS 2016 data to predict individual probabilities of being diabetic from demographic (age, gender, race) and bio-behavioural (body mass index, waist circumference, current smoking) characteristics and self-reported previous diagnosis and use of medication. The model was then applied to data from each NiDS 'wave' to estimate the prevalence at sub-national level by averaging the predicted probabilities of being diabetic for the individuals in each district and adjusting for the imperfect sensitivity and specificity of the predictive model. The sampling design of the survey was taken into account in the procedure. The proportion of patients with diabetes receiving treatment was directly estimated from self-reported data, and treatment coverage was calculated as the ratio between the population proportion who are treated and diabetes prevalence. A smooth variation over time of both prevalence of diabetes and treatment coverage within each district was assumed, and final yearly estimates were generated by fitting a series of generalised linear models.

Table 10 shows the diabetes prevalence in adults (15 years and older) modelled from NiDS over time, contrasted with figures reported in other national surveys. Table 11 depicts the modelled diabetes treatment coverage in adults (15 years and older). These measures show a deteriorating picture over time, with the coverage dropping from 44.4 to 34.8 at a national level between 2008 and 2017. Notably, treatment coverage fell from 71.0 to 29.6 in the Western Cape over this period. A greater than 10-fold increase in prevalence (from 0.8% to 8.3%) was estimated in Limpopo. Caution is warranted when interpreting these changes, as they may be artefacts of the modelling exercise. Nonetheless, the general trends are cause for concern and highlight the need for increased attention to non-communicable diseases in general, and type 2 diabetes mellitus in particular.

UHC11: Cancer detection

The eleventh UHC service coverage indicator reported by Hogan *et al.* is intended to measure coverage of cervical cancer screening in women aged 30 to 49 years, as a measure of preventive service coverage. Hogan *et al.* conceded that, although this indicator was included in some household surveys, insufficient data were available to allow for global monitoring.³ Cervical cancer screening was the only cancer-related indicator included in the NCD Global Monitoring Framework.⁴³ Locally, the SADHS has recorded the proportion of women who have ever had a Pap smear.

However, DHIS records allow for the calculation of the proportion of women who have had a cervical screening test (regardless of the method used). The indicator is defined at present as the number of cervical screening tests performed as proportion of one-tenth of the female population aged 30 years or older. One of many challenges that needs to be catered for is that cervical screening is now recommended every 10 years from age 30 onward in women not living with HIV, but every 3 years from age 20 in those living with HIV. Where screening in line with the newer guideline is already taking place, the indicator will over-estimate the extent of coverage. A new formula for the calculation of the indicator is therefore under consideration for the next NiDS, but has not yet been finalised. As shown in Figure 15, the SADHS 2016 reported the proportion of women who had ever been screened, those who also received the result (to some extent an effective coverage measure), stratified by HIV and health insurance status. In all provinces except the Western Cape, the DHIS reported figure was higher than that reported in SADHS 2016. The observed difference could be related to the differences in HIV prevalence between provinces, and to the implementation of the cervical cancer screening guidelines for women living with HIV, resulting in over-estimation of coverage using the current indicator definition in DHIS.

For the purposes of the UHC index, cervical cancer screening coverage, derived from routine DHIS data, was expressed as an index, capped at 100%. Figure 16 shows the range of the reported coverage per district over time, the index (capped at 100%), contrasted with the SADHS 2016 values. Table 12 show the index values over time as a heatmap, nationally and per province, clearly depicting the progress made.

UHC12: Tobacco control

The final NCD indicator reported by Hogan *et al.* is also cancer-related, but focused on the prevention of lung cancer through tobacco control. The defined indicator is the age standardised prevalence of adults (15 years and older) who report not having smoked tobacco in the 30 days preceding a survey. This is an imperfect proxy measure of effective implementation of tobacco control policies. Data are not obtainable from routine data, but only from surveys, such as NiDS. The most recent WHO Report on the Global Tobacco Epidemic (2019) notes that the Framework Convention on Tobacco Control requires countries to "establish ...surveillance of the magnitude, patterns, determinants and consequences of tobacco consumption and exposure to tobacco smoke", but that only 30% of middle-income countries had access to "recent, representative and periodic data for both adults and youth".⁶¹

Table 10: Diabetes prevalence, national, provincial and district by source, 2008 to 2017

		Diabetes prevalence (15+ years)											SANHANES		SADHS	
		NiDS modelled									Both sexes		Female	Male		
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2012	2016	2016		
National		5,6	6,0	6,5	7,0	7,5	8,0	8,6	9,3	9,9	10,6	9,5	13,2	8,2		
Province	EC	7,4	7,8	8,3	8,8	9,3	9,8	10,4	11,0	11,6	12,2	8,5	17,5	9,8		
	FS	4,1	4,6	5,2	5,8	6,5	7,2	8,1	9,0	10,0	11,2	10,1	13,8	8,3		
	GP	5,2	5,4	5,7	6,1	6,4	6,7	7,1	7,5	7,9	8,3	7,9	9,3	6,6		
	KZ	8,8	9,2	9,6	10,0	10,4	10,8	11,3	11,8	12,2	12,8	10,0	17,1	9,4		
	LP	0,8	1,0	1,3	1,7	2,3	2,9	3,8	5,0	6,4	8,3	4,6	14,8	9,7		
	MP	3,7	4,0	4,3	4,6	4,9	5,3	5,6	6,0	6,5	6,9	5,6	11,5	6,5		
	NC	5,2	5,6	6,1	6,6	7,1	7,7	8,3	8,9	9,6	10,4	21,7	11,7	7,2		
	NW	6,1	6,2	6,3	6,4	6,5	6,6	6,7	6,8	6,9	7,0	12,5	8,6	4,1		
	WC	7,4	8,2	9,0	10,0	11,1	12,2	13,4	14,8	16,3	17,8	11,2	12,2	13,2		
District	EC BUF	2,9	3,8	5,1	6,7	8,7	11,3	14,6	18,6	23,4	29,0					
	DC10	6,6	7,1	7,7	8,4	9,1	9,8	10,6	11,4	12,4	13,3					
	DC12	11,0	12,0	13,1	14,2	15,5	16,8	18,2	19,8	21,4	23,1					
	DC13	8,1	8,3	8,5	8,7	8,8	9,0	9,3	9,5	9,7	9,9					
	DC14	10,2	9,4	8,6	7,9	7,2	6,6	6,0	5,5	5,0	4,6					
	DC15	7,4	7,4	7,4	7,4	7,4	7,4	7,4	7,4	7,4	7,4					
	DC44	5,2	5,2	5,2	5,2	5,2	5,2	5,2	5,2	5,2	5,2					
	NMA	8,6	9,3	10,1	10,8	11,7	12,6	13,5	14,5	15,6	16,7					
	FS DC16	5,5	6,0	6,6	7,2	7,9	8,7	9,5	10,4	11,3	12,3					
	DC18	3,6	3,8	4,0	4,3	4,5	4,8	5,1	5,4	5,8	6,1					
	DC19	5,9	6,6	7,4	8,2	9,1	10,1	11,3	12,5	13,8	15,3					
	DC20	3,7	4,4	5,2	6,1	7,2	8,5	10,0	11,7	13,6	15,8					
	MAN	3,6	3,9	4,4	4,8	5,3	5,9	6,5	7,2	7,9	8,7					
	GP DC42	4,0	3,6	3,3	3,0	2,7	2,5	2,3	2,1	1,9	1,7					
	DC48	9,2	9,0	8,9	8,7	8,6	8,4	8,3	8,1	8,0	7,9					
	EKU	5,0	5,5	6,0	6,6	7,3	8,0	8,8	9,6	10,5	11,5					
	JHB	3,5	3,8	4,2	4,6	5,1	5,6	6,1	6,7	7,3	8,0					
	TSH	9,3	9,4	9,5	9,6	9,7	9,8	10,0	10,1	10,2	10,3					
	KZ DC21	11,0	11,6	12,3	13,0	13,8	14,6	15,4	16,2	17,1	18,1					
	DC22	4,5	5,0	5,6	6,2	6,9	7,7	8,6	9,6	10,6	11,8					
	DC23	6,0	6,0	6,1	6,2	6,3	6,4	6,5	6,6	6,7	6,8					
	DC24	7,6	7,8	8,0	8,2	8,4	8,6	8,7	8,9	9,1	9,3					
	DC25	8,7	8,7	8,7	8,7	8,7	8,7	8,7	8,7	8,7	8,7					
DC26	9,9	10,0	10,0	10,0	10,1	10,1	10,1	10,2	10,2	10,2						
DC27	3,7	4,0	4,2	4,5	4,7	5,0	5,3	5,6	6,0	6,3						
DC28	15,3	14,5	13,7	13,0	12,3	11,6	11,0	10,4	9,8	9,2						
DC29	11,5	12,1	12,8	13,5	14,2	15,0	15,8	16,6	17,5	18,4						
DC43	4,0	4,5	5,0	5,6	6,3	7,1	7,9	8,8	9,8	11,0						
ETH	9,4	9,9	10,4	10,9	11,5	12,1	12,7	13,3	13,9	14,6						
LP DC33	0,3	0,4	0,6	0,8	1,0	1,4	2,0	2,7	3,7	5,1						
DC34	1,8	2,2	2,8	3,6	4,5	5,6	7,0	8,7	10,7	13,2						
DC35	1,0	1,2	1,6	2,0	2,5	3,2	4,1	5,1	6,5	8,1						
DC36	3,4	3,7	4,0	4,4	4,7	5,2	5,6	6,1	6,6	7,2						
DC47	0,4	0,6	0,8	1,1	1,6	2,3	3,3	4,6	6,5	9,1						
MP DC30	7,8	8,3	8,8	9,3	9,9	10,5	11,1	11,8	12,5	13,2						
DC31	3,6	3,7	3,9	4,0	4,2	4,3	4,5	4,7	4,9	5,0						
DC32	2,2	2,3	2,5	2,6	2,7	2,8	3,0	3,1	3,3	3,4						
NC DC6	2,2	2,7	3,2	3,9	4,7	5,7	6,9	8,3	9,9	11,8						
DC7	6,5	7,0	7,5	8,0	8,6	9,2	9,8	10,5	11,2	12,0						
DC8	9,3	9,9	10,4	11,0	11,6	12,3	13,0	13,7	14,4	15,2						
DC9	5,2	5,1	5,0	4,9	4,8	4,7	4,6	4,5	4,4	4,3						
DC45	4,8	5,3	6,0	6,7	7,5	8,4	9,4	10,4	11,6	12,9						
NW DC37	2,9	3,0	3,1	3,2	3,3	3,5	3,6	3,7	3,9	4,0						
DC38	4,0	4,3	4,6	4,9	5,3	5,7	6,1	6,6	7,0	7,5						
DC39	1,7	2,0	2,3	2,8	3,3	3,8	4,5	5,3	6,2	7,2						
DC40	22,5	21,5	20,6	19,7	18,8	18,0	17,2	16,4	15,6	14,9						
WC CPT	7,9	8,6	9,4	10,1	11,0	11,9	12,9	13,9	15,1	16,2						
DC1	13,3	14,4	15,6	16,9	18,2	19,6	21,2	22,8	24,4	26,2						
DC2	4,3	5,0	5,8	6,7	7,8	9,1	10,5	12,1	14,0	16,0						
DC3	10,1	10,6	11,2	11,8	12,5	13,1	13,8	14,6	15,3	16,1						
DC4	5,4	6,5	8,0	9,7	11,7	14,1	16,8	20,0	23,6	27,7						
DC5	2,8	3,4	4,2	5,1	6,2	7,5	9,1	11,0	13,2	15,8						

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Table 11: Diabetes treatment coverage, national, provincial and district, 2008 to 2017

		Diabetes treatment coverage											
		NiDS modelled, 15+ years, Both sexes										SANHANES	
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2012	
National		44,4	43,4	42,4	41,4	40,5	39,5	38,6	37,7	36,7	35,8	37,5	
	Province	EC	47,2	45,7	44,3	42,9	41,5	40,1	38,7	37,3	36,0	34,6	
		FS	40,5	39,5	38,5	37,5	36,5	35,5	34,5	33,6	32,6	31,7	
		GP	49,5	48,1	46,7	45,3	43,9	42,5	41,1	39,7	38,4	37,0	
		KZ	54,6	52,2	49,7	47,2	44,8	42,4	40,0	37,6	35,3	33,1	
		LP	34,1	34,0	33,9	33,7	33,6	33,5	33,4	33,3	33,1	33,0	
		MP	39,3	39,3	39,4	39,4	39,5	39,5	39,6	39,6	39,6	39,7	39,7
		NC	52,1	51,4	50,8	50,1	49,4	48,8	48,1	47,5	46,8	46,1	
		NW	57,9	56,3	54,7	53,1	51,4	49,8	48,2	46,6	45,0	43,4	
		WC	71,0	66,8	62,4	57,7	52,8	47,9	43,1	38,4	33,8	29,6	
	District	EC	73,4	68,5	63,1	57,4	51,5	45,6	39,8	34,2	29,1	24,4	
		DC10	44,7	43,5	42,2	41,0	39,8	38,6	37,4	36,2	35,0	33,9	
DC12		45,3	43,3	41,3	39,3	37,3	35,4	33,5	31,7	29,9	28,2		
DC13		42,9	41,8	40,7	39,6	38,5	37,4	36,4	35,3	34,3	33,2		
DC14		27,6	28,5	29,5	30,5	31,6	32,6	33,7	34,8	35,9	37,0		
DC15		42,7	42,5	42,2	42,0	41,7	41,5	41,2	41,0	40,7	40,5		
DC44		49,9	46,6	43,4	40,2	37,1	34,1	31,3	28,5	25,9	23,5		
NMA		38,7	37,6	36,6	35,5	34,4	33,4	32,4	31,4	30,4	29,4		
FS		57,7	54,7	51,7	48,6	45,6	42,6	39,7	36,8	34,0	31,4		
DC18		51,8	49,8	47,8	45,7	43,7	41,8	39,8	37,9	36,0	34,1		
DC19		41,5	40,3	39,2	38,0	36,9	35,8	34,7	33,6	32,6	31,5		
DC20		52,8	50,6	48,4	46,3	44,1	42,0	39,9	37,8	35,8	33,8		
MAN		70,4	67,4	64,3	61,1	57,8	54,4	51,0	47,5	44,1	40,7		
GP		49,8	52,5	55,2	57,9	60,5	63,1	65,6	68,1	70,4	72,6		
DC48		34,4	30,2	26,3	22,8	19,6	16,7	14,2	12,1	10,2	8,5		
EKU		40,7	41,5	42,4	43,3	44,2	45,1	46,0	46,9	47,8	48,7		
JHB		62,8	60,4	58,0	55,6	53,1	50,7	48,2	45,7	43,2	40,8		
TSH		40,0	40,0	40,0	40,0	40,0	39,9	39,9	39,9	39,9	39,9		
KZ		29,6	29,6	29,7	29,7	29,8	29,8	29,8	29,9	29,9	30,0		
DC21		35,4	34,5	33,7	32,8	32,0	31,2	30,4	29,6	28,8	28,1		
DC23		45,2	44,1	43,0	41,9	40,8	39,7	38,6	37,6	36,5	35,5		
DC24		25,3	25,4	25,6	25,7	25,8	26,0	26,1	26,2	26,4	26,5		
DC25		37,3	36,6	36,0	35,3	34,6	34,0	33,4	32,7	32,1	31,5		
DC26		30,0	30,2	30,3	30,5	30,7	30,9	31,1	31,2	31,4	31,6		
DC27		36,7	35,8	34,9	33,9	33,0	32,1	31,2	30,4	29,5	28,7		
DC28		23,8	24,2	24,7	25,1	25,6	26,1	26,5	27,0	27,5	28,0		
DC29		33,2	32,4	31,6	30,8	30,0	29,3	28,5	27,8	27,1	26,3		
DC43		41,8	40,9	39,9	39,0	38,1	37,2	36,3	35,4	34,5	33,7		
ETH		36,3	36,4	36,4	36,5	36,6	36,6	36,7	36,8	36,8	36,9		
LP		30,2	31,2	32,1	33,1	34,1	35,2	36,2	37,2	38,3	39,4		
DC34		15,0	17,0	19,1	21,5	24,1	26,8	29,8	32,9	36,2	39,7		
DC35		70,2	66,5	62,7	58,8	54,7	50,5	46,3	42,2	38,2	34,3		
DC36		47,7	45,7	43,7	41,7	39,8	37,8	36,0	34,1	32,4	30,6		
DC47		76,6	72,5	68,0	63,1	57,9	52,6	47,2	41,8	36,7	31,8		
MP		27,8	29,0	30,2	31,5	32,8	34,1	35,4	36,7	38,1	39,5		
DC31		53,0	52,9	52,7	52,6	52,4	52,3	52,1	52,0	51,9	51,7		
DC32		57,8	56,9	55,9	55,0	54,1	53,1	52,2	51,3	50,3	49,4		
NC		61,8	59,4	57,0	54,6	52,1	49,6	47,1	44,7	42,2	39,8		
DC7		62,1	58,4	54,7	50,9	47,1	43,3	39,6	36,1	32,6	29,4		
DC8		42,1	41,7	41,3	40,9	40,6	40,2	39,8	39,4	39,0	38,6		
DC9		48,3	46,6	44,9	43,2	41,6	40,0	38,3	36,7	35,2	33,6		
DC45		28,0	28,9	29,8	30,7	31,6	32,5	33,5	34,4	35,4	36,4		
NW		52,8	51,8	50,7	49,7	48,7	47,7	46,7	45,7	44,7	43,7		
DC38		56,2	54,5	52,7	51,0	49,2	47,4	45,7	43,9	42,2	40,5		
DC39		42,5	43,1	43,7	44,3	44,8	45,4	46,0	46,6	47,2	47,8		
DC40		28,2	29,0	29,8	30,6	31,4	32,2	33,1	34,0	34,8	35,7		
WC	50,4	48,5	46,5	44,6	42,7	40,8	38,9	37,1	35,3	33,5			
CPT	38,5	37,9	37,4	36,9	36,4	35,9	35,3	34,8	34,3	33,8			
DC1	62,9	60,0	57,0	54,0	51,0	48,0	44,9	41,9	39,0	36,2			
DC3	33,6	34,0	34,4	34,9	35,3	35,7	36,1	36,6	37,0	37,4			
DC4	37,7	37,7	37,6	37,5	37,4	37,4	37,3	37,2	37,1	37,1			
DC5	59,0	56,9	54,8	52,6	50,4	48,2	46,1	43,9	41,8	39,7			

Figure 15: Cervical cancer screening indicators by source, national and provincial

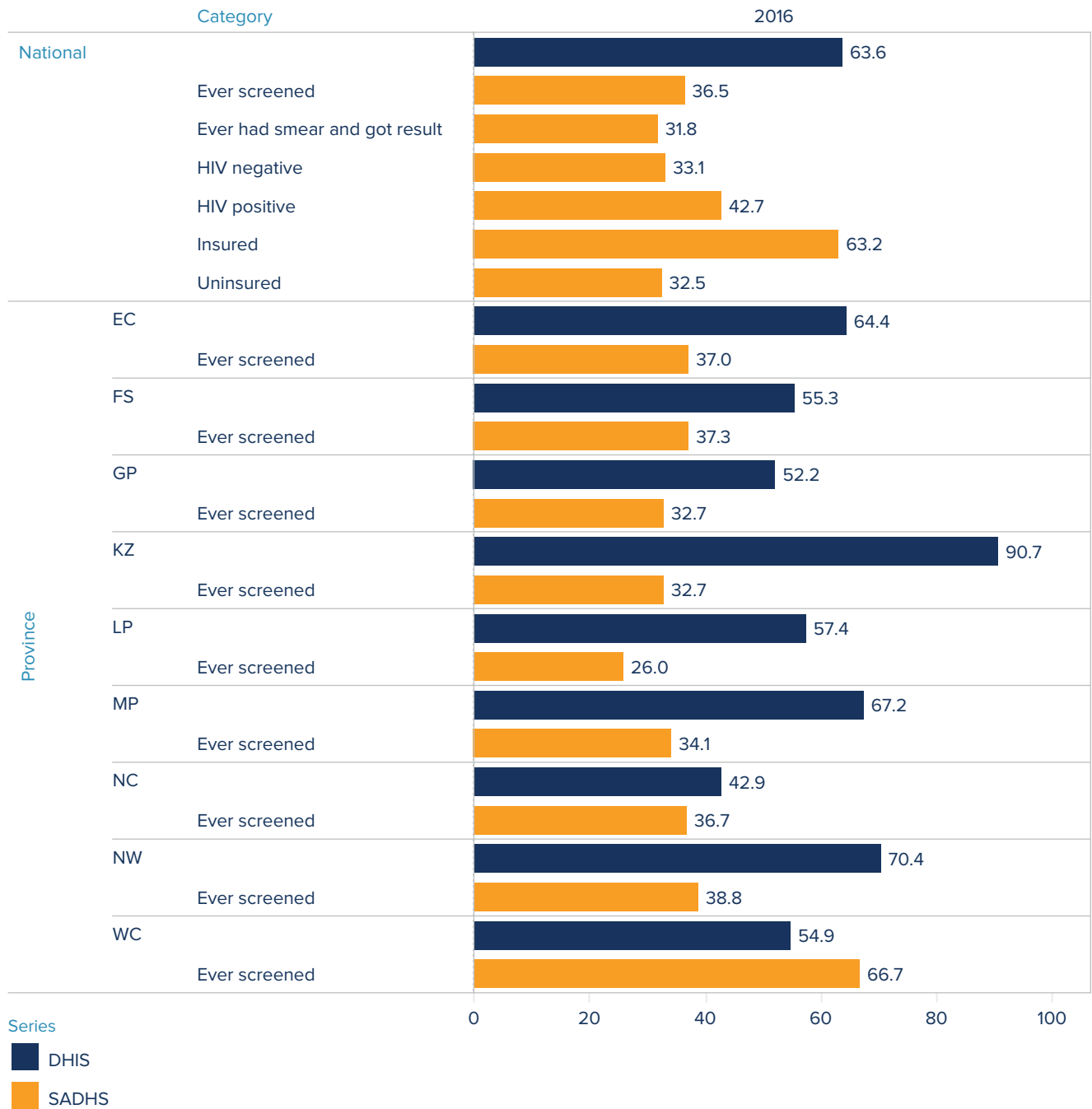


Figure 16: Range of cervical screening coverage, 2000/01 to 2018/19

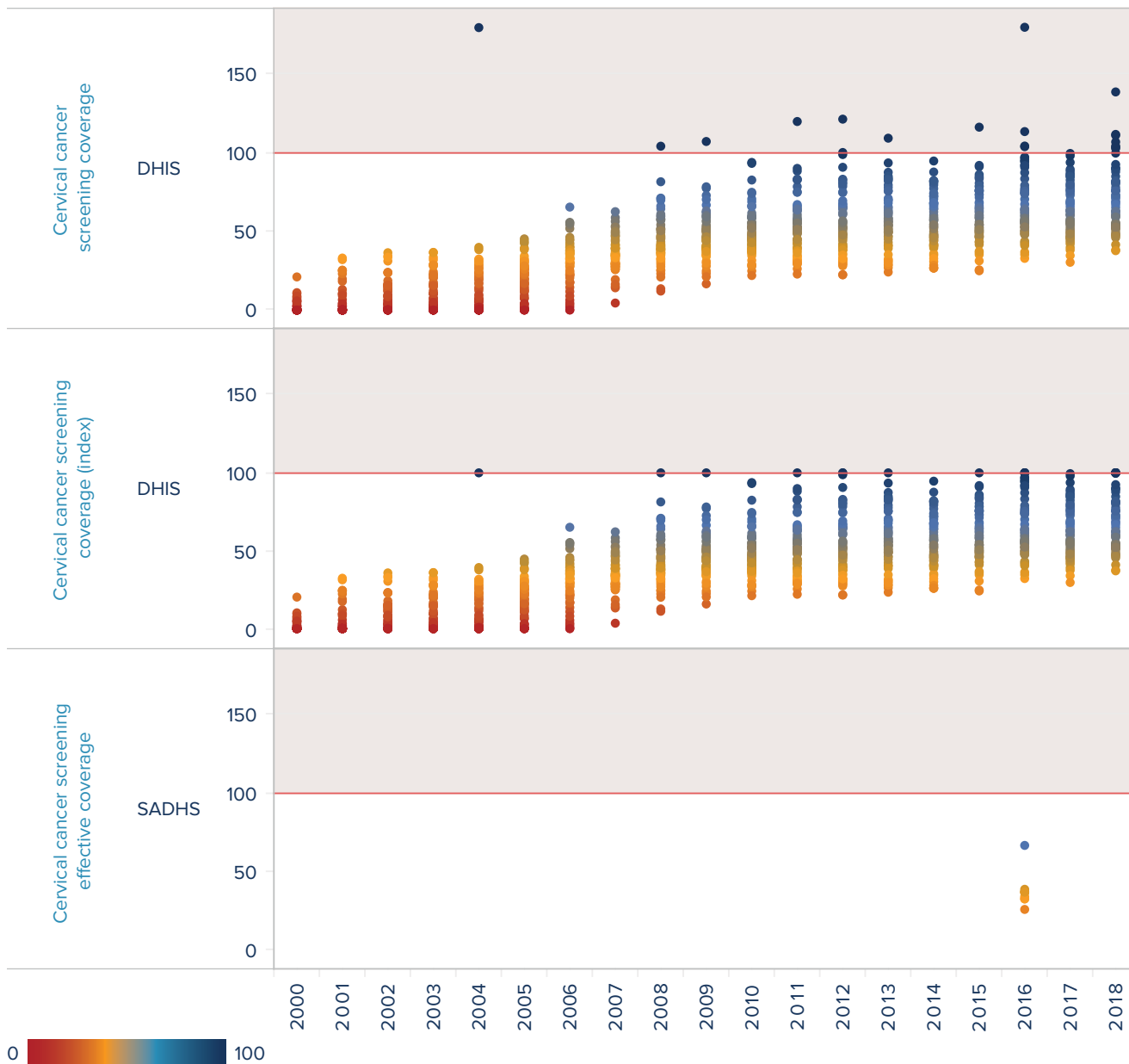


Table 12: Cervical screening coverage (index), national and provincial

30+ years

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
National	3.6	6.5	9.4	10.5	13.6	19.8	30.0	34.1	43.2	45.0	49.7	52.2	52.0	55.9	56.7	58.3	63.6	60.8	65.1	
Province	EC	1.0	1.0	1.0	1.0	1.0	6.3	25.6	31.2	35.4	37.9	39.3	40.0	49.2	60.3	60.3	64.4	63.3	71.6	
	FS	1.0	1.0	15.0	20.7	22.1	28.0	32.3	35.0	39.2	40.9	38.9	44.9	51.9	53.0	42.0	59.0	55.3	50.6	60.6
	GP	11.0	13.0	14.0	17.6	21.2	25.6	35.2	34.6	40.6	39.9	45.4	39.0	38.2	42.9	44.9	46.3	52.2	47.4	52.0
	KZ	1.0	1.0	3.9	3.3	14.4	21.9	32.3	39.3	51.3	47.6	58.9	78.4	83.1	79.4	74.2	75.9	90.7	79.2	84.9
	LP	1.0	1.0	1.0	1.0	1.0	19.2	51.8	35.9	49.4	60.3	52.7	56.5	52.8	58.0	49.8	51.9	57.4	55.6	52.3
	MP	2.0	2.7	3.5	5.5	5.3	11.4	22.0	27.9	35.9	45.9	53.1	51.9	49.9	55.6	64.1	67.8	67.2	77.9	89.9
	NC	1.0	1.0	11.7	16.3	19.1	25.5	33.6	29.1	29.1	34.1	36.8	31.4	30.6	32.2	30.8	35.2	42.9	39.7	46.0
	NW	1.0	1.0	1.0	1.0	1.0	3.8	17.7	36.1	51.3	46.5	47.9	48.3	47.7	61.8	67.2	66.2	70.4	68.5	69.0
	WC	6.0	25.3	31.1	28.4	28.5	32.0	30.6	33.7	46.8	51.4	58.8	57.7	54.9	57.4	57.2	54.3	54.9	57.8	55.6

Figure 17 shows the range of values reported in South Africa, for non-smoking prevalence, as derived from SADHS, SANHANES and NiDS. Table 13 depicts the prevalence figures as a heatmap, at the national and provincial level, by sex. Females in the Northern and Western Cape have a markedly lower prevalence of not smoking than their counterparts in other provinces. The differences are less striking among males, but both provinces still show the

lowest prevalence of not smoking in the most recent NiDS 'wave' and the most recent SADHS. Figure 18 shows how the most recent data for the proportion of males and females not smoking varied between provinces (for both sources) and between districts (from NiDS). The extent to which the national estimates obscured considerable variation is clearly demonstrated.

Figure 17: Range of non-smoking prevalence (index), 1998 to 2017

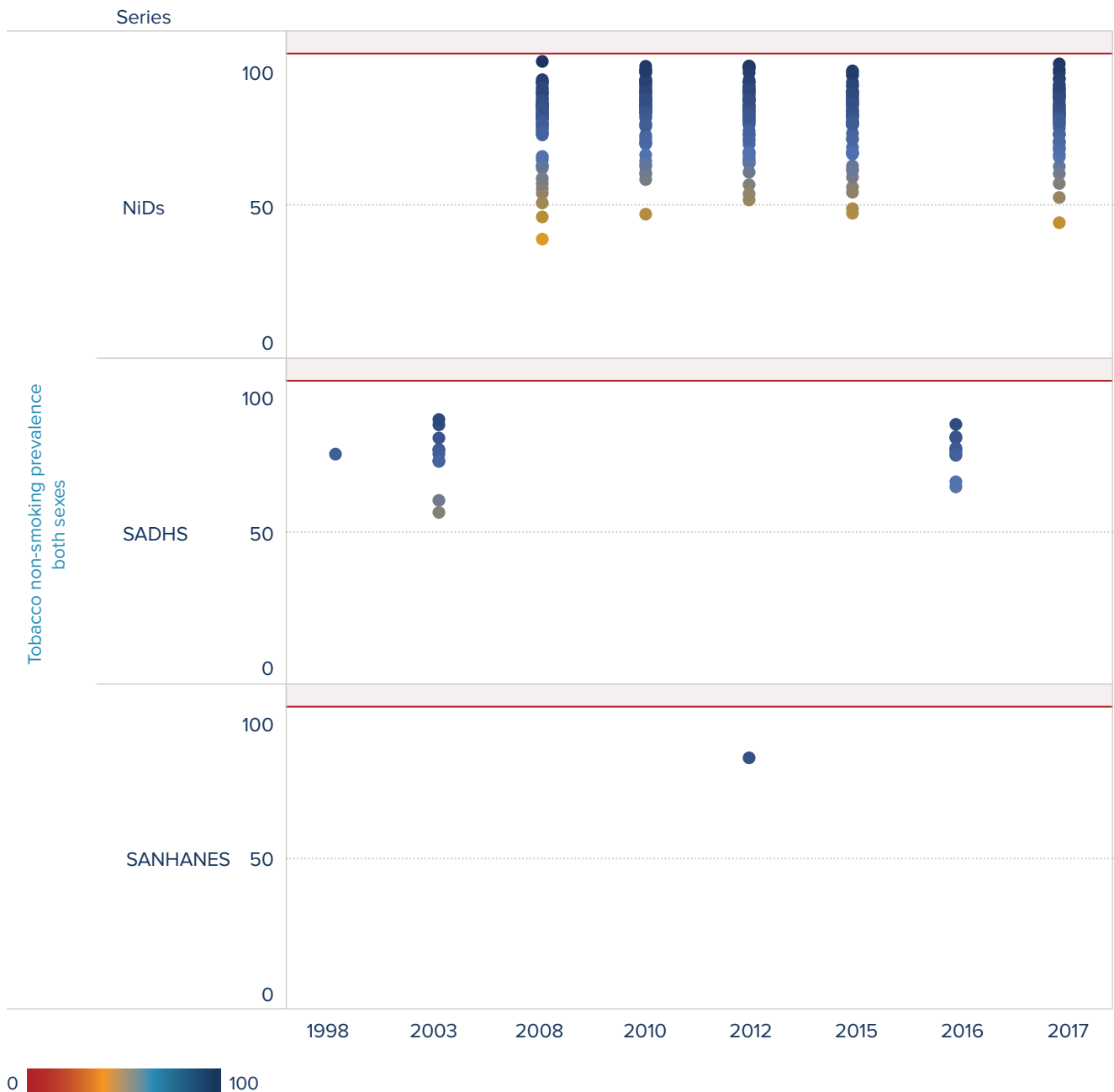
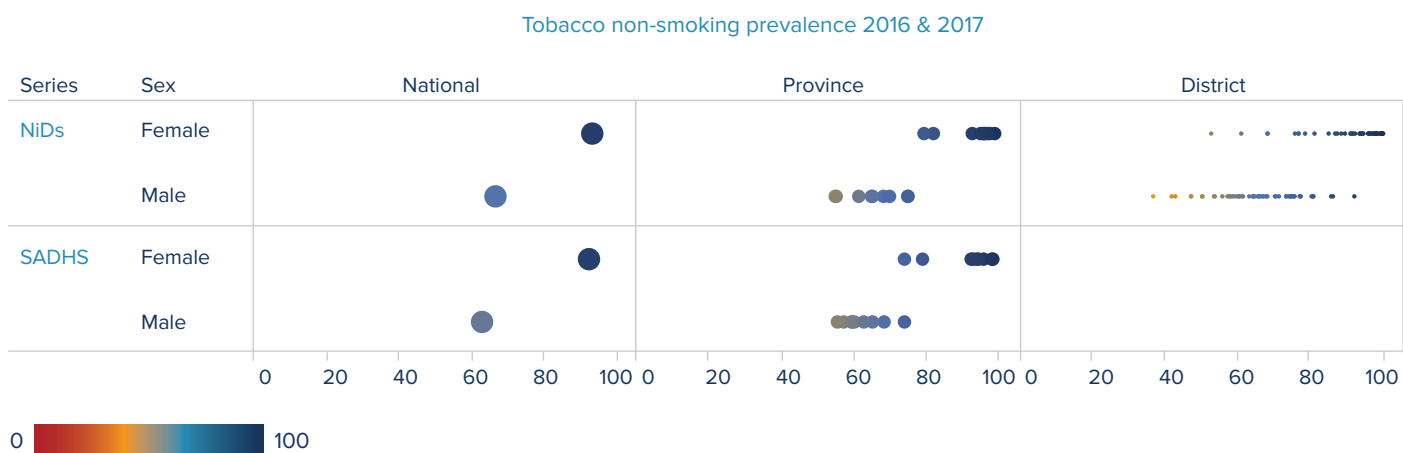


Table 13: Non-smoking prevalence by sex and source, national and provincial

Tobacco non-smoking prevalence

	SANHANES 2012		SADHS				2008		2010		NiDs 2012		2015		2017	
	female	male	female	male	female	male	female	male	female	male	female	male	female	male	female	male
	National	92.7	70.8	89.8	64.9	95.9	75.1	90.9	64.0	92.8	69.7	92.3	66.5	92.1	65.4	93.1
Province																
EC	93.3	68.6	91.1	56.1	92.5	59.0	93.0	68.3	95.3	69.7	93.8	67.8	93.8	65.4	94.6	69.5
FS	91.5	53.1	88.3	59.4	92.0	59.1	91.4	59.9	93.8	71.3	95.6	58.6	93.2	58.3	96.3	61.0
GP	95.6	78.2	90.6	61.5	93.5	62.4	93.0	63.9	91.3	70.0	90.9	66.8	92.5	66.5	92.3	64.5
KZ	95.9	64.3	95.8	79.0	97.7	64.8	94.7	66.4	98.1	72.5	97.2	68.8	97.8	69.9	97.1	74.5
LP	97.9	73.1	96.2	75.1	98.0	73.6	94.9	70.8	99.1	81.9	98.5	72.9	98.1	73.8	98.5	74.6
MP	96.4	71.3	96.0	66.6	94.0	59.8	93.8	68.6	95.6	69.0	96.8	75.0	96.5	70.4	95.5	67.8
NC	75.5	61.7	65.0	48.6	78.6	55.1	74.3	54.4	79.2	60.5	79.4	54.2	75.7	57.7	79.0	54.8
NW	94.8	77.7	92.7	62.4	95.4	68.0	93.7	61.8	95.0	71.6	98.2	69.5	96.9	61.7	95.6	64.8
WC	73.2	60.4	71.3	50.2	73.6	56.8	72.2	50.4	75.4	50.9	74.4	54.5	72.1	52.5	81.6	54.5

Figure 18: Range of non-smoking prevalence by sex, source and geographic level



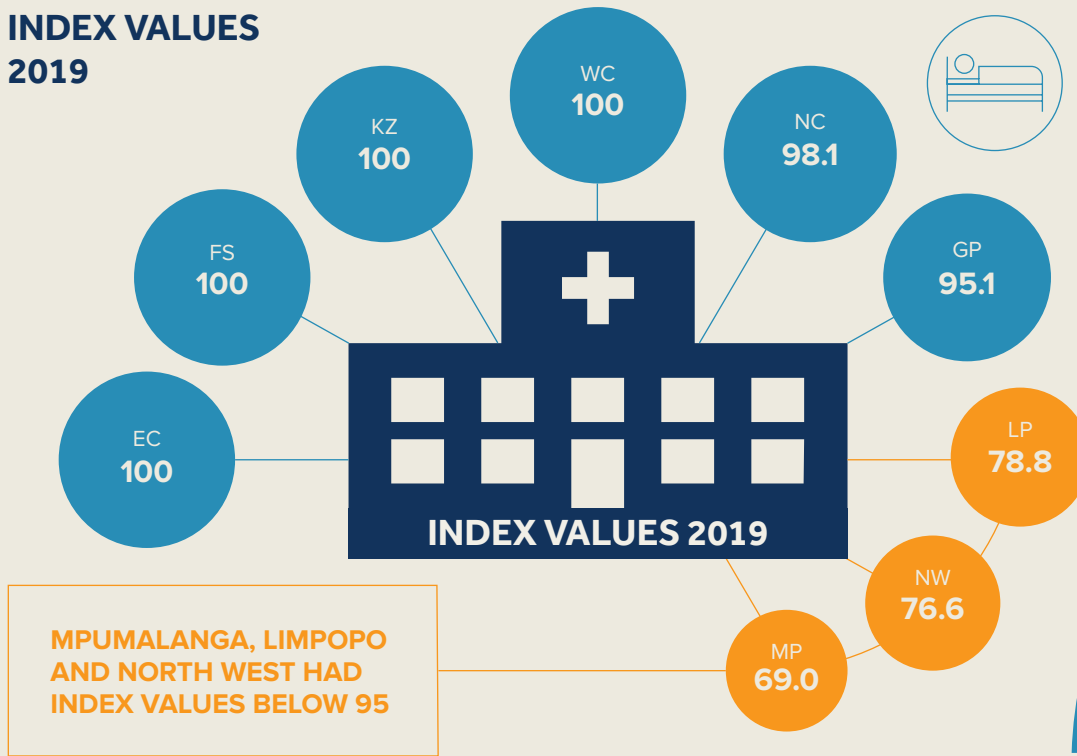


Service capacity and access

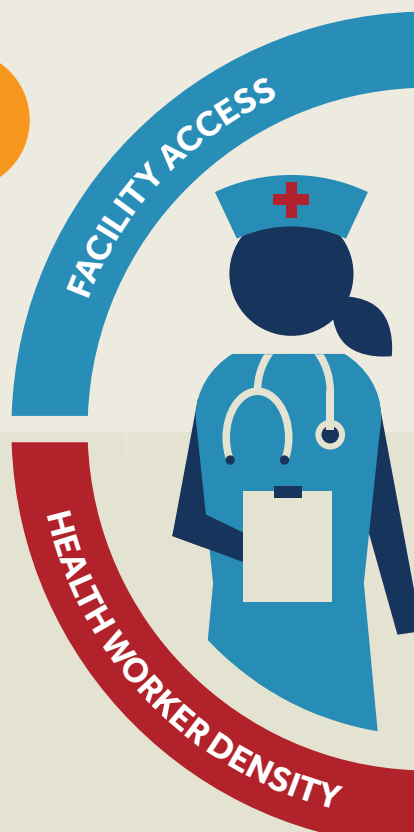
UHC 13 HOSPITAL BED DENSITY PER 10 000 UNINSURED POPULATION (RESCALED)

The index is calculated relative to a threshold value of 18 hospital beds per 10 000 population.

INDEX VALUES 2019



HOSPITAL BED DENSITY HAS REMAINED HIGH FROM 2003-2019



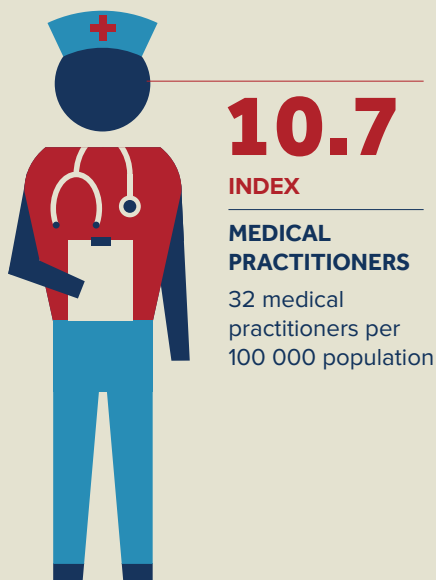
UHC 14 HEALTH WORKER DENSITY PER 100 000 (INDEX)

This index was calculated as the geometric mean of scaled scores for each cadre, with thresholds of 30 physicians, 100 nurses and midwives, and 5 pharmacists per 10 000 population.



THERE IS AN ABSOLUTE DEFICIT OF HEALTH WORKERS IN THE PUBLIC SECTOR

IN 2019, THERE WERE:





Indicator insights

Although hospital bed density remained high in most provinces over time, this is not an indication of the quality of care received in the public sector, but merely indicative of access.

There has been some improvement in health worker density in the country however there still a glaring deficit in the public sector.

UHC 15 PROPORTION OF HEALTH FACILITIES WITH ESSENTIAL MEDICINES

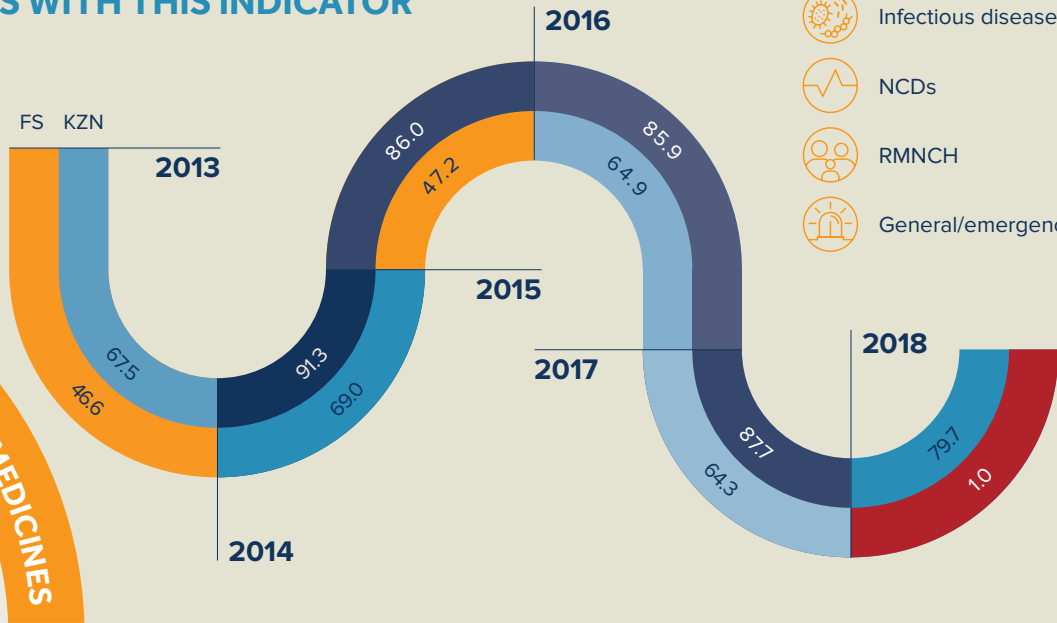
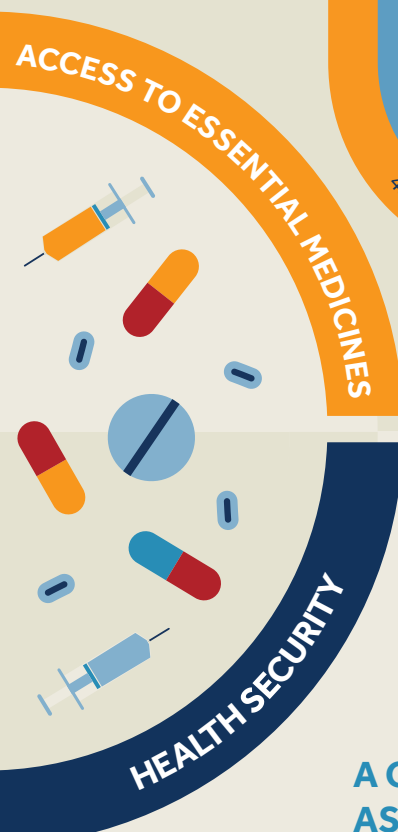
This measure is the inverse of the DHIS tracer stock-out indicator. Currently, there are insufficient data on the availability and access to essential medicines. Stock-outs remain prevalent across the country.



THERE ARE VARIOUS DATA QUALITY ISSUES WITH THIS INDICATOR

THE TRACER LIST INCLUDES:

- Infectious diseases
- NCDs
- RMNCH
- General/emergency care



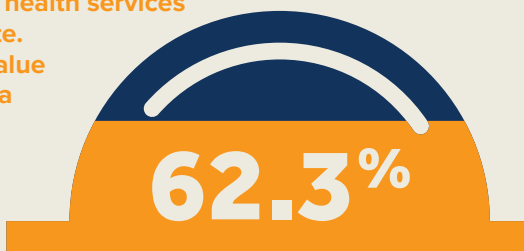
UHC 16 INTERNATIONAL HEALTH REGULATIONS CORE CAPACITY INDEX

This proxy measure is based on 13 core capacities for preparedness in dealing with health security events.

A CHECKLIST TO GUIDE ASSESSMENT WAS PUBLISHED IN 2013.

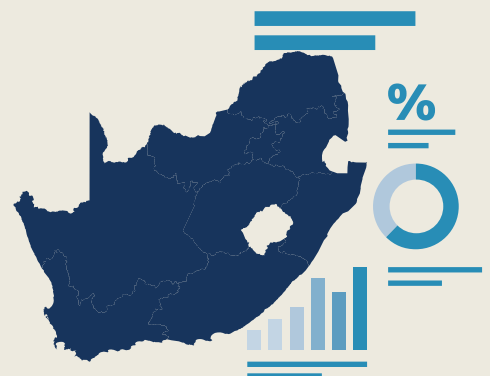
AN ALTERNATIVE MEASURE

for sub-national monitoring is the environmental health services compliance rate. The national value for South Africa in 2018 was:



ENVIRONMENTAL HEALTH SERVICES COMPLIANCE RATE

The NDoH tool assessed compliance of municipalities to the national norms and standards for rendering environmental health services which was developed and implemented in 2015/16.



Service capacity and access

The final set of UHC service coverage indicators deals with service capacity and access, all of which are proxy indicators. The elements measured are hospital access, health worker density, access to essential medicines, and health security.

UHC13: Facility access

The thirteenth UHC service coverage indicator reported by Hogan *et al.* is a proxy measure, the number of hospital beds per 10 000 population. The index is calculated relative to a threshold value of 18 hospital beds per 10 000 population. At a national or even, to some extent, provincial level, the total number of hospital beds can be used. However, at a district level, the number would be skewed in major centres by the presence of regional and central hospitals, which serve patients from across the province, or even across a number of provinces. Likewise, including private sector beds would skew the measure in major urban areas, even though these facilities serve a wider population. At a district level, it could therefore be argued that the most sensitive measure would be the number of district hospital beds per 10 000 uninsured population. An alternative measure, which focuses on the primary health care level but adds a measure of effectiveness, might be the percentage of ideal clinics. The Ideal Clinic Realisation and Maintenance

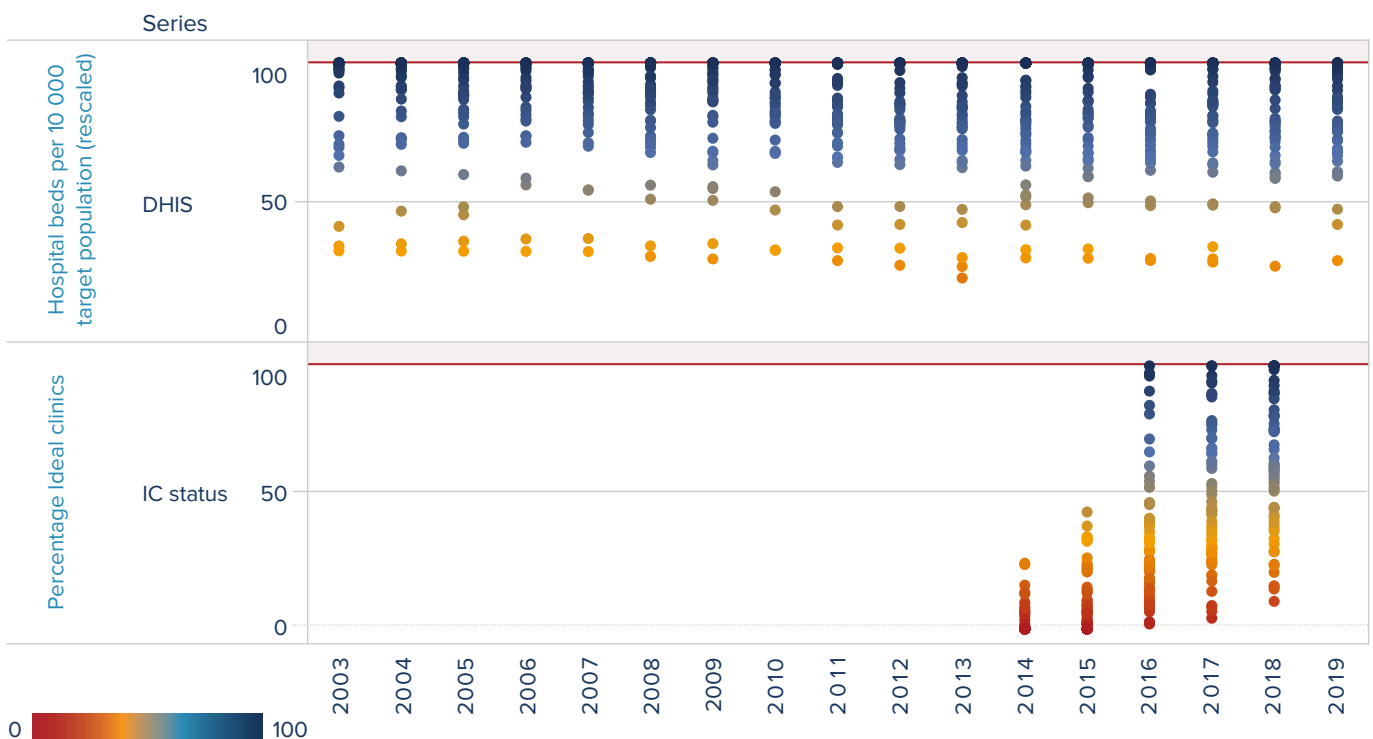
(ICRM) programme is a quality-improvement process, whereby fixed clinics, community health and day centres are assessed against a set of norms covering infrastructure, staffing, medicines and other supplies, and administrative processes. The Ideal Clinic Assessment Tool consists of 10 components and 32 sub-components. The programme commenced in 2013 and the aim is to ensure that all PHC facilities qualify for ideal status by 2020/21. Progress against that target has been described in a previous issue of the District Health Barometer.⁶² In the early years of the programme, every clinic was not assessed. However, by 2017/18 a total of 43.5% of all fixed PHC facilities had obtained ideal status, ranging from 20.4% in the Eastern Cape to 78.6% in Gauteng. In time, as the ideal hospital concept is applied, that might offer another alternative, as might the number of beds in Office of Health Standards Compliance (OHSC) accredited hospitals.

For the time series depicted here, the total public sector hospital bed density was normalised by uninsured population. A modelled estimate of the uninsured population per district has been developed using a small area model based on Census 2011, Community Survey 2016 and scaled using the General Household Survey 2018 and Council for Medical Schemes data.^a

Figure 19 shows the range of values for the hospital bed density per province and per district, over time, as the rescaled index. The alternative ideal clinic measure is also shown. Complete time series data for the private sector are difficult to obtain.

Table 14 shows the hospital bed density for 10 000 uninsured population for the time series 2003 to 2019. As can be seen in Table 15, at a provincial level, the index has remained high over

Figure 19: Range of health facility access measures, 2003 to 2019



a Modelling done by Daniel Shapiro, Insight Actuaries. Methodology described in DHB 2018/19 (forthcoming).

Table 14: Hospital bed density per 10 000 uninsured population, national, provincial and district

		DHIS																	
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
National		24.0	23.3	22.7	22.4	22.1	21.4	20.9	20.3	20.0	19.4	19.3	18.6	19.1	18.6	19.0	18.1	17.9	
	Province	EC	26.5	24.4	25.7	25.2	24.4	23.8	23.3	23.7	23.3	22.7	21.5	22.1	21.8	21.4	21.0	20.6	20.6
		FS	20.9	21.1	21.0	21.6	21.4	21.3	20.9	21.0	20.6	20.5	20.3	19.8	20.1	20.0	19.9	19.5	19.8
		GP	21.7	21.4	20.8	20.1	20.7	19.8	19.6	19.5	19.0	18.7	18.1	16.9	17.9	18.4	18.3	17.7	17.1
		KZ	31.7	30.7	29.3	28.7	28.2	27.2	25.9	24.2	24.9	23.4	24.3	22.6	23.6	21.7	24.1	20.9	20.9
		LP	20.1	20.0	18.1	17.9	17.4	17.1	16.3	15.7	15.3	15.3	15.3	15.2	14.0	14.2	14.6	14.2	14.2
		MP	16.4	16.5	16.5	16.9	15.5	15.0	14.7	14.7	13.5	12.4	12.8	12.5	13.1	13.1	13.0	13.0	12.4
		NC	22.3	22.1	21.8	21.9	21.0	21.8	20.4	21.2	18.6	19.0	18.0	16.0	18.4	17.9	20.2	19.3	17.7
		NW	18.7	17.5	15.9	18.3	17.6	17.1	16.8	16.1	15.6	15.5	14.1	13.5	15.6	14.4	13.2	13.6	13.8
		WC	23.8	24.0	23.3	22.0	22.4	21.8	22.0	20.4	20.6	20.4	20.5	20.7	20.8	20.5	20.3	20.0	20.0
District	EC	BUF	41.3	43.1	44.3	42.1	40.7	39.4	36.4	39.5	35.9	38.6	37.3	35.7	36.3	34.5	34.2	30.6	31.0
		DC10	33.2	32.3	31.3	31.3	32.9	32.7	32.0	32.3	32.1	31.4	30.7	30.3	28.7	27.6	27.2	27.0	26.6
		DC12	25.4	24.3	24.3	24.1	21.1	20.9	20.9	20.8	20.5	20.3	20.3	20.5	20.3	20.5	20.3	19.4	19.3
		DC13	28.6	28.1	27.8	27.2	26.7	26.0	26.0	25.9	25.9	25.9	19.6	25.4	25.2	25.0	24.9	24.7	24.6
		DC14	18.2	17.6	17.1	16.4	16.3	16.1	16.1	16.7	16.6	16.1	15.9	15.8	15.6	15.4	15.3	16.3	15.8
		DC15	23.1	15.7	21.6	21.6	21.3	19.9	18.8	20.0	20.0	18.5	18.1	18.3	17.9	17.6	16.0	17.0	17.0
		DC44	13.3	13.2	13.1	13.3	12.7	14.3	15.5	14.3	14.1	12.4	12.4	12.3	11.9	11.6	11.6	11.5	11.7
	NMA	34.1	32.4	32.3	31.0	30.5	29.6	28.1	27.7	27.7	26.4	25.6	25.9	25.5	25.5	25.3	24.4	25.1	
	FS	DC16	6.0	6.0	5.9	5.9	5.9	5.6	5.5	6.0	6.2	6.1	5.5	5.5	5.5	5.5	5.5	10.7	11.0
		DC18	16.1	14.9	14.8	14.4	14.3	14.3	14.2	14.2	14.1	14.0	13.9	13.8	14.5	14.4	14.3	13.7	13.6
		DC19	12.8	12.8	12.9	12.9	12.9	12.8	12.4	12.3	12.7	12.6	12.6	12.3	12.2	12.4	12.3	11.7	12.1
		DC20	14.6	14.6	14.6	14.7	14.6	13.9	14.6	14.8	14.4	14.3	14.2	12.3	15.5	15.4	15.3	15.1	15.0
		MAN	45.0	46.9	46.7	49.3	48.4	48.7	47.2	47.6	45.6	45.3	44.8	44.4	42.7	42.3	42.4	40.9	41.7
	GP	DC42	17.6	16.3	15.9	16.5	15.1	15.3	15.5	15.4	15.2	15.4	14.6	14.4	14.7	14.6	15.4	14.3	13.9
		DC48	27.3	27.1	27.7	26.8	27.2	28.7	29.3	29.0	29.6	29.4	29.3	29.3	29.0	31.0	32.6	30.0	28.9
		EKU	12.6	13.2	13.2	13.3	16.1	13.3	13.2	13.1	12.9	13.1	13.1	12.8	12.7	13.4	13.5	13.2	13.0
		JHB	22.1	21.5	20.5	20.1	20.0	19.5	19.4	19.2	18.8	18.6	17.8	16.9	17.9	18.2	17.1	16.9	16.2
		TSH	35.6	34.6	33.1	30.5	30.5	29.8	29.1	28.8	27.5	26.0	24.8	21.3	24.5	24.7	24.9	24.0	23.3
	KZ	DC21	22.5	22.3	22.0	22.1	21.5	20.0	19.7	17.6	19.8	18.8	19.7	19.7	19.4	18.8	22.7	17.8	12.3
		DC22	59.5	57.5	53.6	50.9	50.6	48.3	42.2	34.8	34.3	33.8	37.8	36.5	34.5	34.5	33.6	33.3	32.6
		DC23	17.9	17.2	15.7	15.0	14.8	12.3	11.7	14.1	13.6	14.1	13.8	8.9	13.2	13.0	12.9	12.6	12.5
		DC24	27.4	27.1	25.8	24.7	24.5	24.6	23.9	23.7	24.2	24.3	24.0	23.8	23.7	23.5	23.2	22.6	22.3
		DC25	41.3	38.7	34.9	33.0	32.6	32.4	31.5	31.0	30.0	14.0	22.8	23.0	23.1	22.4	20.5	21.4	21.5
		DC26	30.3	29.9	29.6	28.7	27.9	26.3	25.6	23.9	24.1	22.4	21.5	21.2	22.0	17.9	15.4	16.3	15.6
		DC27	23.1	22.9	20.2	19.6	19.6	19.4	17.4	19.5	20.0	20.2	19.8	19.6	19.2	18.6	16.8	16.6	16.5
		DC28	29.4	29.0	28.8	28.1	28.1	27.8	26.4	24.1	25.6	23.7	23.4	23.1	23.2	23.1	22.5	23.0	22.8
		DC29	17.6	16.5	16.2	17.7	17.5	16.0	16.9	15.5	15.8	15.0	15.5	14.3	14.8	14.5	14.3	14.1	13.8
DC43		30.6	29.6	28.9	29.4	28.4	27.7	26.4	26.0	25.8	25.4	24.9	24.1	23.7	23.4	30.6	22.4	22.2	
ETH		34.3	33.0	31.7	31.4	30.4	30.1	29.1	26.7	28.2	27.5	28.0	24.5	27.2	22.8	30.4	22.3	24.3	
LP		DC33	17.8	17.9	16.9	17.5	17.2	17.1	16.5	14.5	14.4	14.2	13.9	14.2	10.8	13.5	14.2	13.3	13.8
	DC34	20.5	20.0	18.4	16.6	16.0	15.5	15.6	15.2	14.7	14.3	14.4	14.0	13.9	12.1	13.4	13.2	13.1	
	DC35	23.2	23.8	21.9	22.5	21.8	21.8	19.6	19.4	18.8	18.8	18.8	18.9	17.1	17.7	17.6	17.5	17.3	
	DC36	20.9	20.8	18.3	18.4	18.1	18.4	18.4	18.1	18.0	19.0	19.1	18.8	18.5	18.2	17.9	17.6	17.4	
	DC47	17.7	17.1	14.1	14.3	13.6	12.6	12.3	12.2	11.6	11.8	11.8	11.8	11.7	11.6	11.5	11.0	10.8	
	MP	DC30	19.4	19.0	18.6	18.0	16.8	16.3	15.8	16.7	14.6	14.5	15.1	14.7	14.5	14.6	13.4	12.1	13.1
		DC31	7.5	8.5	8.8	10.2	9.9	9.3	9.2	8.6	7.6	7.7	7.8	7.6	9.1	8.9	8.9	8.7	7.7
DC32		20.0	19.8	20.0	20.1	18.1	17.7	17.3	17.2	16.7	14.2	14.7	14.4	14.8	14.9	15.4	16.5	15.4	
NC	DC6	19.9	19.9	22.8	19.0	19.0	19.2	17.2	19.2	17.0	16.4	17.1	13.4	17.6	17.6	17.6	17.6	17.6	
	DC7	17.4	17.9	17.7	18.4	18.2	18.0	17.7	17.5	16.8	20.5	16.5	16.2	17.2	12.7	15.2	14.3	14.1	
	DC8	17.9	17.6	17.4	19.6	16.1	15.8	15.6	14.8	14.1	13.8	11.6	9.4	10.7	14.9	16.2	16.5	15.7	
	DC9	29.5	28.8	27.6	27.5	27.4	30.0	30.2	29.6	25.4	25.3	25.9	22.6	27.5	25.4	30.4	28.4	24.0	
	DC45	16.5	16.3	16.0	15.8	15.7	15.4	10.1	14.9	11.9	11.5	11.3	11.4	11.3	11.1	11.0	10.9	10.8	
NW	DC37	6.3	6.4	6.6	6.7	6.8	6.3	6.4	6.0	5.3	5.0	5.0	6.0	6.1	5.3	5.2	5.0	5.3	
	DC38	20.0	19.5	8.3	17.1	16.5	16.6	16.2	15.8	15.6	15.2	15.1	10.2	19.2	13.8	12.7	13.5	13.7	
	DC39	12.1	13.1	15.0	15.2	14.1	13.1	11.5	12.3	12.0	12.9	4.2	13.0	12.2	11.9	6.2	10.6	10.8	
	DC40	48.6	41.5	48.1	47.6	45.7	44.9	44.6	42.4	41.9	42.2	41.8	36.0	34.6	38.7	38.1	36.7	36.3	
WC	CPT	27.7	28.7	28.0	26.0	26.8	25.9	26.2	23.7	24.4	24.1	24.6	24.9	25.1	24.8	24.6	24.4	24.6	
	DC1	20.9	20.4	20.1	19.4	19.1	18.8	18.4	18.0	17.9	17.5	16.7	16.5	16.4	16.0	15.6	13.9	13.6	
	DC2	18.6	18.0	17.7	17.7	17.5	17.2	17.6	17.3	16.9	16.7	16.7	16.5	16.1	15.8	15.6	15.6	15.2	
	DC3	11.3	11.1	10.9	10.6	9.9	10.2	10.0	9.8	8.8	8.8	8.6	9.6	9.4	9.2	9.0	8.8	8.6	
	DC4	18.8	18.3	15.9	16.4	16.5	16.4	17.0	16.0	15.6	15.4	15.2	14.9	15.0	14.8	14.6	14.5	14.3	
	DC5	28.8	21.9	19.9	19.8	19.7	19.5	19.4	19.2	19.1	18.9	18.8	18.6	18.4	18.3	18.1	17.9	17.7	

the time period. Only in Mpumalanga, Limpopo and the North West province is the index below 95 in the most recent year.

The provision of healthcare facilities has been emphasised in a recent determination of the number of excess deaths in low- and middle-income countries amenable to personal healthcare services, and the portions attributable to non-utilisation of healthcare versus that attributable to receipt of poor-quality care.⁶³ Based on Global Burden of Disease data in 137 countries, a total of 15.6 million excess deaths were estimated to have occurred in 2016, of which 8.6 million excess deaths were amenable to health care, and 5.0 million were due to receipt of poor-quality care, whereas 3.6 million were due to non-utilisation. These data underscore the importance not only of access, but of access to quality services.

UHC14: Health worker density

The fourteenth UHC service coverage index indicator reported by Hogan *et al.* is particularly challenging. The defined indicator is the number of health professionals per person, combining the numbers of physicians, psychiatrists and surgeons. The index is calculated by separately rescaling the health worker density ratios for each of the three cadres in relation to the minimum observed values across Organisation for Economic Co-operation and Development (OECD) countries since 2000, as follows: physicians = 0.9 per 1 000, psychiatrists = 1 per 100 000, and surgeons = 14 per 100 000. The first challenge is the term ‘physician’; in American parlance this refers to all medical practitioners, whereas in Britain (and most former colonies) the term refers to internal medicine specialists only. An equivalent in South Africa would be the total number of medical practitioners. Further, while the number of psychiatrists and surgeons (both general and sub-speciality) registered by the Health Professions Council

of South Africa can theoretically be obtained, the number in practice is not known, nor the proportion practising in any given sector. An attempt has been made in the private sector, in the Health Market Inquiry report, to quantify the number of practising general practitioners, surgical specialists and non-surgical specialists per 1 000 insured population down to district level.⁶⁴

An alternative measure, based on the density of physicians, nurses and midwives, and pharmacists, was used by the GBD 2017 SDG Collaborators.⁷ This index was correspondingly calculated as the geometric mean of scaled scores for each cadre, with thresholds of 30 physicians, 100 nurses and midwives, and 5 pharmacists per 10 000 population. The threshold for ‘physicians’ is therefore markedly higher than that applied by Hogan *et al.* (30 versus 9 per 10 000 population).

For the purposes of the South African index, PERSAL data were used to calculate the index values based on the numbers of medical practitioners, professional nurses and pharmacists employed in the public sector, as per the GBD method. Quite why the health worker density index reported by the GBD 2017 SDG Collaborators for South Africa (61.3 in 2016) was so much higher than the index calculated from PERSAL data (15.3) is unclear. The index value reported by Hogan *et al.* was also higher (35.6). Figure 20 contrasts the indices reported by Hogan *et al.* and the GBD 2017 SDG Collaborators for South Africa with those calculated from PERSAL data using the latter’s methods. It also shows the contribution to the health worker density index of the indices for medical practitioners, professional nurses and pharmacists.

Figure 21 shows the range of values for the index per cadre over time, and then the resultant health worker density index.

Table 15: Hospital bed density (index), national and provincial

		Hospital beds per 10 000 target population (rescaled)																
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Province	National	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	EC	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	FS	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	GP	100	100	100	100	100	100	100	100	100	100	100	94	100	100	100	98	95
	KZ	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	LP	100	100	100	100	96	95	91	87	85	85	85	85	78	79	81	79	79
	MP	91	92	92	94	86	83	81	81	75	69	71	69	73	99	72	72	98
	NC	100	97	100	100	100	100	100	100	100	100	100	89	100	100	100	100	100
	NW	100	100	89	100	98	95	93	90	87	86	79	75	87	80	73	76	77
	WC	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100



Figure 20: Health worker density index values, by source, 2019

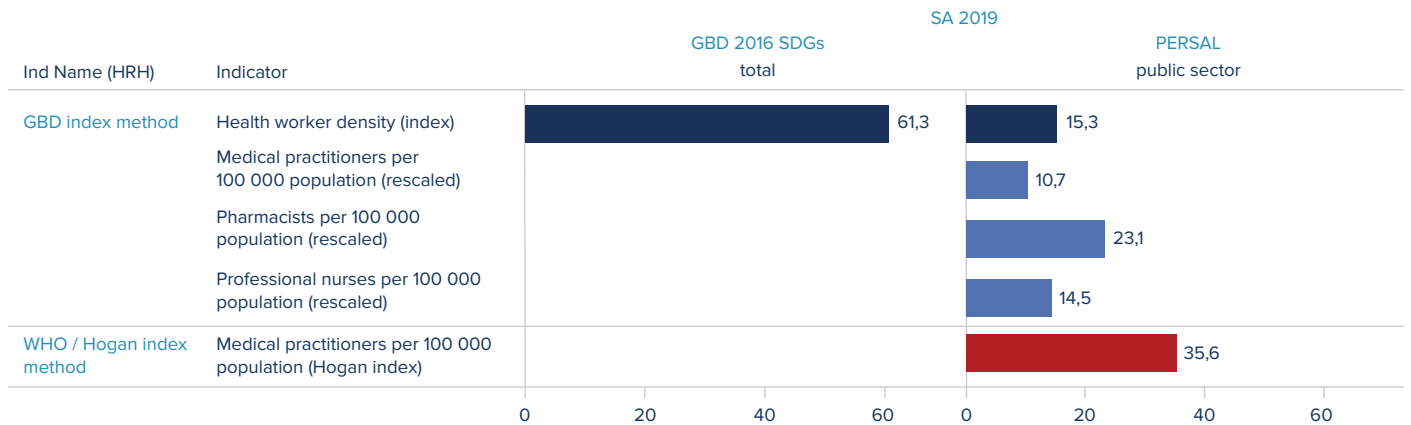


Figure 21: Range of health worker density index indicators, 2000 to 2019



Table 16 shows the health worker density index per province as a heat map, over the time period 2000 to 2019, as calculated from public sector PERSAL records. The absolute deficit in the public sector is clearly evident, when scaled in relation to GBD 2017 SDG Collaborators threshold, but so is some progress over time, nationally, and in most provinces. The smallest gains have been in the better resourced provinces of Gauteng and the Western Cape. Nationally, the index value has almost doubled, from 8.1 to 15.3.

Some of the greatest gains have been achieved in the provision of pharmacists in the public sector. Table 17 shows the trend in pharmacist density index over time, per province. Nationally the number of pharmacists per 100 000 population has increased from 3.1 to 11.6 between 2000 and 2019, in index terms from 6.2 to 23.1. That level of staffing remains inadequate when compared with the index norm of 50 per 100 000 (5 per 10 000).

It has been argued that monitoring the adequacy of human resources for health in will require “new, broader health-workforce benchmarks”, and in particular include community health workers and mid-level health workers.⁶⁵ Other important elements to track, apart from equity in distribution and accessibility, include the sex composition of the health workforce and the quality of personnel.

UHC15: Access to essential medicines

The fifteenth UHC service coverage indicator reported by Hogan *et al.* relates to essential medicines availability and access. The indicator is described as the proportion of health facilities with availability of the WHO-recommended core

Table 16: Health worker density (index), national and provincial

		Public sector																	
		2000	2001	2003	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Province	National	8.1	7.9	7.5	8.5	8.9	9.2	9.7	9.8	11.8	13.0	13.4	14.4	14.7	15.0	14.6	14.8	14.9	15.3
	EC	5.8	5.1	5.6	7.5	7.6	7.8	8.0	8.6	9.6	11.4	11.8	12.0	12.1	13.6	13.8	14.5	15.3	16.6
	FS	7.8	8.2	8.4	9.3	9.6	9.6	8.7	8.0	8.3	10.1	13.0	13.8	14.0	13.2	12.8	13.1	12.6	13.2
	GP	12.9	10.6	8.8	8.3	8.3	8.2	9.0	9.0	13.3	14.4	14.5	14.8	15.2	15.3	14.8	15.4	15.1	15.0
	KZ	8.6	8.4	7.6	8.7	9.5	10.2	11.1	11.0	10.9	12.5	13.5	15.1	15.1	15.0	15.1	14.8	14.7	15.1
	LP	5.6	5.7	6.2	7.3	7.8	8.7	9.3	9.3	10.7	11.7	12.2	13.1	13.2	14.1	14.5	14.2	14.0	14.3
	MP	6.1	6.7	5.7	7.6	8.0	7.8	7.9	8.5	11.4	12.5	9.8	11.2	12.0	11.8	12.0	12.5	12.5	12.6
	NC	8.1	8.6	7.1	8.5	10.0	10.8	10.1	11.4	13.7	15.3	17.1	17.5	18.3	19.0	18.7	19.1	19.8	19.2
	NW	4.9	5.7	6.0	7.4	7.9	7.7	7.3	7.8	8.0	9.3	9.7	10.5	11.3	11.3	11.0	11.7	12.3	12.7
	WC	13.1	12.9	10.7	11.2	11.1	11.8	13.1	12.9	15.8	16.3	16.2	16.9	17.0	17.3	16.1	16.1	16.1	17.2



Table 17: Pharmacists per 100 000 uninsured population (index)

		Public sector																	
		2000	2001	2003	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Province	National	6.2	6.8	6.2	8.0	8.5	8.9	9.0	9.0	14.3	17.1	18.2	19.5	20.5	22.1	21.8	22.1	22.5	23.1
	EC	4.6	3.7	4.4	7.0	6.6	6.7	6.4	7.0	8.5	11.4	12.5	13.0	13.4	17.7	19.5	20.7	22.8	25.9
	FS	4.6	6.1	6.3	8.1	8.1	7.3	8.0	7.8	9.4	15.9	23.2	23.8	25.7	29.7	26.9	26.7	26.0	27.7
	GP	10.2	9.2	7.3	7.1	7.0	7.4	7.7	7.2	19.1	21.0	22.4	22.5	23.0	23.3	22.9	23.5	23.0	22.8
	KZ	6.6	7.0	6.2	8.1	9.1	9.6	9.5	8.9	8.7	11.5	13.2	15.0	15.6	16.6	16.7	16.5	16.8	17.2
	LP	4.0	4.5	4.4	6.1	7.3	8.7	9.6	9.0	12.4	14.5	15.5	16.8	17.0	19.5	21.2	20.8	21.8	21.6
	MP	4.6	6.2	4.6	7.8	8.7	7.7	8.1	7.8	16.9	20.1	11.5	12.7	15.0	15.1	16.0	15.9	16.1	16.2
	NC	4.6	6.2	4.8	7.2	10.9	10.4	9.0	11.7	18.2	22.4	25.7	25.6	29.0	31.8	29.8	33.3	35.8	34.4
	NW	3.2	4.8	4.9	7.4	7.9	8.4	7.3	7.5	8.7	10.6	11.5	12.8	15.0	15.1	14.8	15.3	16.2	17.3
	WC	12.2	14.6	11.8	13.3	13.5	15.1	16.3	16.6	32.5	34.5	35.3	37.8	38.7	40.0	37.6	37.3	36.9	37.8



list of essential medicines. Hogan *et al.* conceded that there were insufficient data to track this indicator at present, and this indicator was omitted from the 2019 global report.^{3,66} The development of a global accountability mechanism for access to essential medicines is critical, and some progress has been made in defining appropriate indicators.^{67,68} Although improved data accessibility is expected in the public sector, particularly from the Stock Visibility System, data are as yet not available. The only alternative is the DHIS indicator, defined as the proportion of primary care facilities (fixed clinics, community health centres/day centres) that experienced a stock-out of any tracer item for any time during the period under review. The current tracer list includes only 10 items, with a spread between infectious diseases (nevirapine oral solution, zidovudine tablets, the 4-drug TB initiation fixed-dose combination, cotrimoxazole tablets), non-communicable diseases (metformin tablets), RMNCH (hexavalent vaccine, injectable contraceptive) and general/emergency care (adrenaline injection, paracetamol tablets, normal saline infusion solution).⁶⁹ Based on the 2011/12 and 2012/13 DHIS data, the stock-out rate for any TB medicine was estimated as 10.7% (ranging from 4.3% in the Western Cape to 25.4% in the Free State).⁷⁰ By contrast, 2013 data from the National Stop Stock Outs Survey, a civil society conducted telephonic survey, showed a national stock-out rate of TB and HIV medicines of 21.5% (ranging from 4.4% in North West to 53.9% in the Free State). Broadly, this analysis confirmed that stock-outs remain prevalent, across districts and provinces, and that the DHIS and Stop Stock Outs data are correlated at a district level, despite differences in methods.

Honda *et al.* have shown that the availability of medicine has the greatest impact on the probability of patients attending public health facilities in South Africa, more so than other quality of care indicators, such as receiving expert advice

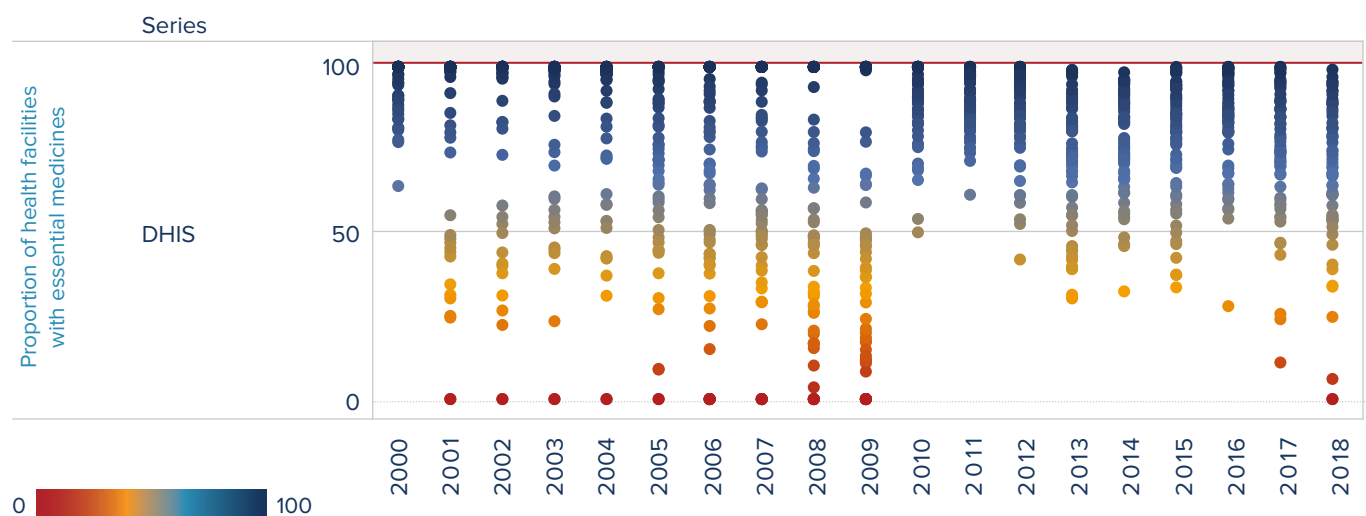
or a thorough examination.⁷¹ The only other medicines-related indicator included in the National Indicator Data Set is the number of stable CCMDD clients who collected their medicines at a pick-up-point (PuP) in the reporting period. In the absence of a suitable denominator, this measure is difficult to interpret in any meaningful way.

Figure 22 shows the range of values recorded in DHIS for stock-outs over time, as an 'index' expressed in positive terms (the proportion without a stock-out), capped at zero. That there are potential data problems is evident from several stock-out rates exceeding 100%. Table 18 shows these data as a heatmap, per province. There are clearly data quality issues in some years (e.g. Free State in 2018) and sudden changes in apparent performance which seems questionable (e.g. KwaZulu-Natal in 2013). The Western Cape results from 2006 to 2009 also appear to reflect a reporting problem, rather than problems with actual medicines shortages.

UHC16: Health security

The final, sixteenth, UHC service coverage indicator reported by Hogan *et al.* deals with health security, and is based on the International Health Regulations (IHR) core capacity index.^{72,73} Hogan *et al.* noted that the values reported were based on informant reports to WHO, but that Joint External Evaluations were planned in future. The IHR core capacity index is based on 13 core capacities (national legislation, policy and financing; co-ordination and National Focal Point communications; surveillance; response; preparedness; risk communication; human resources; laboratory; points of entry; zoonotic events; food safety; chemical events; and radionuclear emergencies). A checklist to guide assessment

Figure 22: Range of access to essential medicines (index), 2000/01 to 2018/19



was published in 2013.⁷⁴ This is a proxy measure, as the events that would trigger an IHR response (such as a public health emergency of international concern (PHEIC)) are rare, and the IHR is only available a single national figure. Nonetheless, a WHO African region report from 2018 rated South Africa as having the highest health security scores in the region (together with Cameroon, Côte d'Ivoire, Seychelles, and Zambia), based on IHR compliance.⁷⁵

An alternative measure for sub-national monitoring is the environmental health services compliance rate.⁷⁶ The NDoH used an assessment tool to assess compliance of municipalities for adherence to the national norms and standards for rendering environmental health services at municipal level which was developed and implemented in 2015/16. Figure 23 shows the range of values recorded for this assessment in 2016/17, 2017/18 and 2018/19. Some changes were made to the assessment tool in 2017/18, which complicates comparability over time. The Figure also

shows the values recorded in WHO World Health Statistics in 2018 and 2019 for the IHR core capacity index.

An alternative proxy measure might be the number of environmental health practitioners per 100 000 population. The National Department has set a norm of 10 per 100 000 population, in line with WHO.⁷⁷ The South African figure, based on PERSAL data, is far lower (in the range of 1-2 per 100 000), but excludes those employed by local government. However, a 2017-18 report from the South African Local Government Association (SALGA) pointed out that “no Municipality in the country meets the laid down norm for EHP personnel in South Africa”.⁷⁸

The heatmap shown in Table 19 highlights the changes between the annual assessments, per province, again drawing attention to the challenge of comparing results from two slightly different assessment instruments.

Table 18: Access to essential medicines (index), national and provincial

DHIS

	2000	2001	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
National	95.3	82.6	85.4	84.6	76.9	68.3	63.8	53.7	46.4	90.8	89.7	84.7	73.2	76.0	77.2	81.9	74.6	62.6
EC	85.9	44.8	55.3	54.1	55.2	63.3	50.9	44.5	34.2	91.1	92.1	86.3	81.0	75.3	78.8	83.1	79.1	73.7
FS	100.0	100.0	99.2	92.9	69.0	38.4	47.1	28.6	11.7	69.2	87.4	86.2	67.5	69.0	47.2	64.9	64.3	1.0
GP	97.9	98.4	98.7	98.9	93.4	89.6	89.6	80.6	67.6	83.1	79.2	77.1	84.9	83.0	88.4	86.5	83.0	81.8
KZ	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.8	97.1	46.6	91.3	86.0	85.9	87.7	79.7
LP	100.0	99.9	99.8	98.8	82.2	65.0	51.2	26.7	20.8	85.5	86.5	70.5	65.6	54.6	59.1	57.8	47.4	34.5
MP	100.0	99.7	99.0	97.9	87.9	83.9	75.8	49.1	29.8	97.8	85.0	83.0	81.6	73.0	84.8	84.9	76.4	55.0
NC	90.7	86.3	92.0	89.5	49.2	43.1	54.3	49.8	44.8	87.5	81.8	89.3	82.3	83.4	91.1	87.5	53.9	70.3
NW	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	91.2	85.7	70.7	73.9	59.5	61.9	97.8	68.2	55.0
WC	90.2	48.8	51.9	54.0	44.6	1.0	1.0	1.0	1.0	100.0	100.0	100.0	97.2	94.7	94.4	95.2	95.7	90.3


0  100

Table 19: Environmental health services compliance rate, national and provincial

	2016	2017	2018
National	43.1	63.0	62.3
EC	56.0	62.1	66.9
FS	46.8	76.2	59.4
GP	59.0	71.4	68.8
KZ	37.9	58.8	56.4
LP	17.0	54.8	64.2
MP	50.7	64.3	58.0
NC	41.6	56.6	75.2
NW	20.5	65.8	40.5
WC	53.3	63.2	68.3


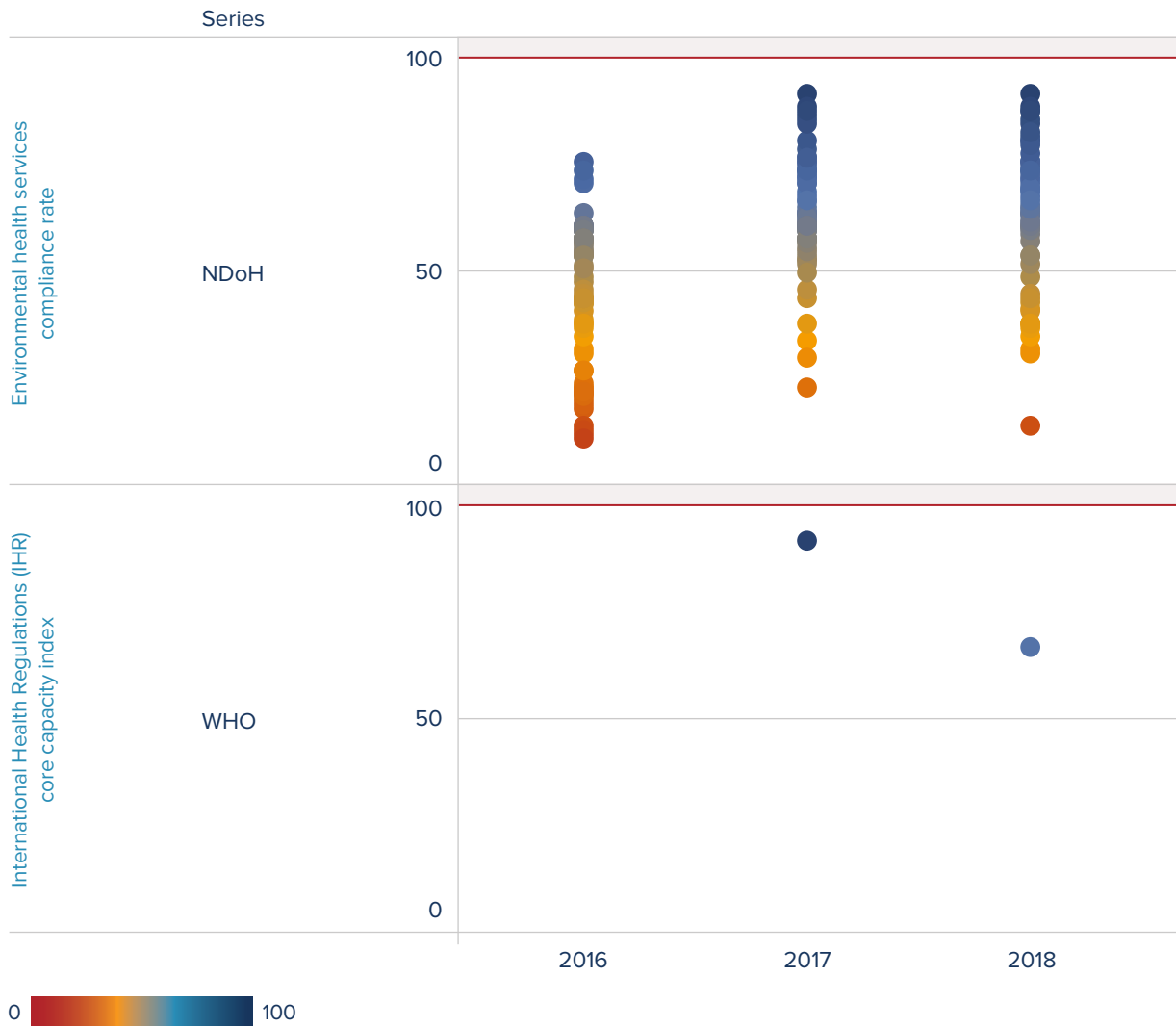
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Figure 23: Range of health security indicators, 2016/17 to 2018/19





Overall UHC service coverage index

DATA FROM 2016 - 2018

INDEX 1 NATIONAL LEVEL UHC

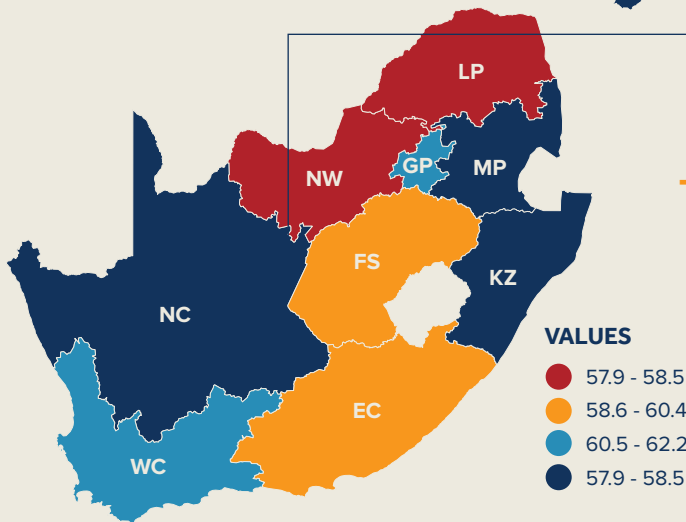


61.8

THIS INDEX MOSTLY USED SURVEY DATA

The national figure from Hogan *et al.* was 67.

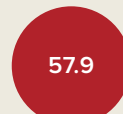
INDEX 2 PROVINCIAL LEVEL UHC



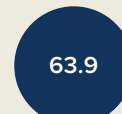
61.5

THIS INDEX INTRODUCES MORE ROUTINE DATA

The values ranged from:



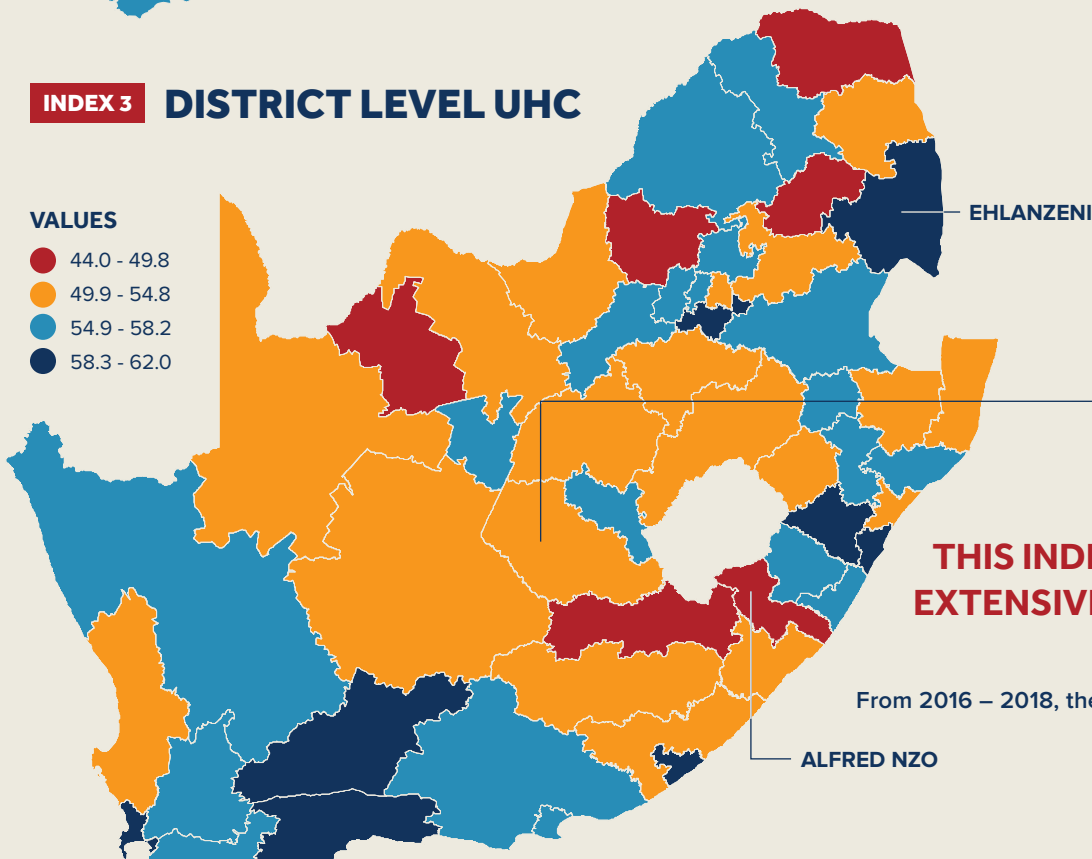
Limpopo



KwaZulu-Natal



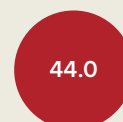
INDEX 3 DISTRICT LEVEL UHC



56.9

THIS INDEX HAD THE MOST EXTENSIVE USE OF ROUTINE DATA SOURCES

From 2016 – 2018, the district values ranged from:



Alfred Nzo



Ehlanzeni



Indicator insights

Overall, the adapted South African UHC indices are lower than those reported by Hogan *et al.*, primarily due to the inclusion of more effective coverage indicators, where coverage is lower due to inclusion of a quality adjustment. Household surveys have consistently shown high coverage of RMNCH interventions, but some poor health outcomes suggest that either the extent or quality of services provided is inadequate.

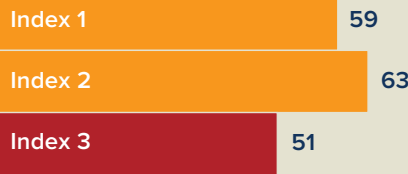
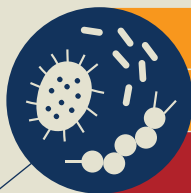
RMNCH



RMNCH HAD THE HIGHEST VALUES AND SHOWED GREATER IMPROVEMENT OVER TIME



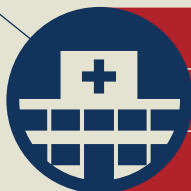
INFECTIOUS DISEASES



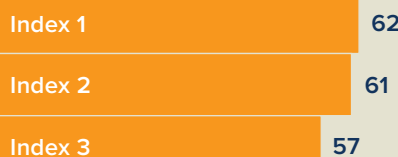
NCDs



SERVICE CAPACITY AND ACCESS



UHC INDEX

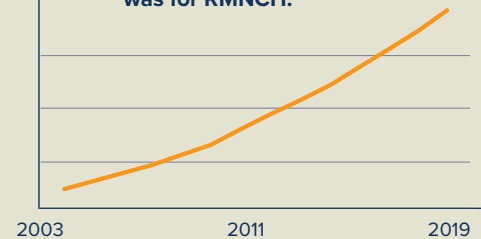


GENERAL UHC THEMES



ROUTINE DATA SHOWED THE GREATEST INCREASE

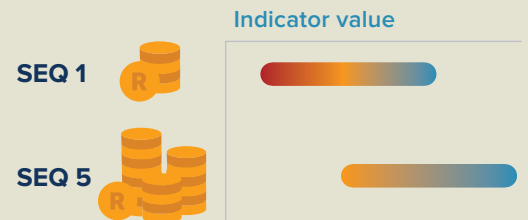
The most dramatic increase was for RMNCH.



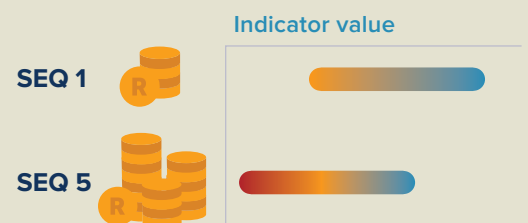
INDICATORS THAT CONTRIBUTED TO THE INCREASE IN THE NATIONAL INDEX (BASED ON ROUTINE DATA) INCLUDE:

- CYPR
- Antenatal coverage before 20 weeks' gestation

EQUITY TRENDS



RMNCH, infectious diseases and service capacity had higher scores in less deprived districts.



This trend was partially reversed for NCDs.

Overall UHC service coverage index

Two versions of the overall UHC service coverage index, at the national level, can be calculated – Index 1 relying to the greatest extent possible on nationally representative survey data (Table 20) and Index 2 using routine data sources wherever possible (Table 21). Index 2 can be further disaggregated to provincial level. Index 2 used routine data (DHIS) for UHC1 and UHC2, instead of survey data. For UHC8, the Stats SA General Household Surveys were used, instead of the Census and Community Survey. For UHC12, NiDS was used instead of SADHS and SANHANES, as there was a more comprehensive time series available for the time periods of interest. Given the difference in data availability by source, at the provincial level the maximum data value within the time period was used for each indicator.

The overall most recent values for Index 1 and Index 2 are fairly consistent (61.8 and 61.5). Provincially, the Index 2 values for 2016-2018 ranged from 57.4 in Limpopo to 63.9 in KwaZulu-Natal. To put those figures in context, Hogan *et al.* reported national figures in a range of 22 to 86, with a global median of 65 (and South Africa at 67). The population-weighted mean for sub-Saharan African countries was 40. The Index 2 values per province are shown in the Core Tables, for the time series 2003-2007, 2008-2011, 2012-2015, and 2016-2018.

Based predominantly on survey data, the drivers of improvement in the national index have been the pneumonia case fatality rate (smoothed), the HIV treatment rollout, household sanitation, non-raised blood pressure, cervical cancer screening and health worker density. Based on routine data, improvements in the couple year protection rate (CYPR) and the antenatal coverage before 20 weeks' gestation have also contributed to the increase in the index value. Survey data showed less marked changes in RMNCH measures than did routine sources. Based on routine data, changes in NCD performance were less impressive than was evident from periodic surveys. Gains in terms of tobacco control have not progressed in the time period under review. Although more modest, improvement in the capacity index was largely due to improvements in health worker density.

A third UHC index (Index 3), suitable for the district level, was adapted from the 'routine' version of the index (Index 2), changing the data source for UHC6 from the Thembisa model to DHIS-Tier.Net, and reverting back to the Census and Community Surveys for UHC8, since the StatsSA GHS is not disaggregated to district level. Without additional modelling or data extraction to fill in the gaps, it is only feasible to calculate the district-level index for 2016-2017, as shown in Table 22. Based on this basket of index indicators, the best UHC index value of 62 was observed in Ehlanzeni (DC32, MP) while the worst index value of 44 was in Alfred Nzo (DC44, EC).

Table 20: UHC service coverage index 1

		Latest/closest available data for time period				
Tracer	Indicator	1998-2002	2003-2007	2008-2011	2012-2015	2016-2018
RMNCH	1 Demand for family planning satisfied with modern methods	79.0	81.3	81.3	81.3	75.7
	2 Births attended by skilled health personnel	84.4	91.2	94.3	94.3	96.7
	3 Immunisation under 1 year coverage (index)	70.8	73.4	76.9	79.4	81.9
	4 Pneumonia case fatality under 5 years rate (rescaled)		74.8	84.0	91.1	95.5
Infectious	5 Tuberculosis effective treatment coverage		44.7	56.6	55.1	51.9
	6 Antiretroviral effective coverage (PLHIV on ART and virally suppressed)	0.3	5.2	20.2	36.2	53.4
	7 Percentage of population sleeping under insecticide-treated nets	ND	ND	ND	ND	ND
	8 Percentage of households with access to improved sanitation	58.5	64.4	68.9	75.6	75.6
NCDs	9 Prevalence of nonraised blood pressure age-standardised (rescaled)		47.7	47.9	59.0	60.2
	10 Percentage of people with diabetes receiving treatment		44.4	41.4	37.7	35.8
	11 Cervical cancer screening coverage (index)	9.4	34.1	52.2	58.3	65.1
	12 Tobacco non-smoking prevalence	76.0	77.4	83.8	83.8	77.5
Capacity	13 Hospital beds per 10 000 target population (index)	100.0	100.0	100.0	100.0	100.0
	14 Health worker density (index)	7.5	9.2	13.0	15.0	14.9
	15 Proportion of health facilities with essential medicines	83.6	63.8	84.7	77.2	62.6
	16 Environmental health services compliance rate				43.1	63.0
	RMNCH	77.9	79.9	83.9	86.3	87.0
	Infectious	4.2	24.6	42.9	53.2	59.4
	NCDs	26.7	48.6	54.3	57.4	57.4
	Capacity	39.7	38.8	48.0	47.2	49.2
	UHC Index	24.3	43.9	55.3	59.4	61.8

Note: ND = no data

Table 21: UHC service coverage index 2

Index 2: National & Provincial - Primarily routine data		2003-2007	2008-2011	2012-2015	2016-2018	2016-2018 (excl #16 EHS)
Tracer	Indicator	ZA	ZA	ZA	ZA	ZA
RMNCH	1 Couple year protection rate (index)	30.1	34.7	66.6	70.1	70.1
	2 Antenatal 1st visit coverage before 20 weeks (index)	28.7	32.1	45.8	55.0	55.0
	3 Immunisation under 1 year coverage (index)	76.6	77.0	82.9	81.9	81.9
	4 Pneumonia case fatality under 5 years rate (rescaled)	74.8	84.0	91.1	95.5	95.5
Infectious	5 Tuberculosis effective treatment coverage	44.8	56.6	55.1	55.6	55.6
	6 Antiretroviral effective coverage (PLHIV on ART and virally suppressed)	5.2	20.2	36.2	53.4	53.4
	7 Percentage of population sleeping under insecticide-treated nets	ND	ND	ND	ND	ND
NCDs	8 Percentage of households with access to improved sanitation	68.3	75.4	79.5	83.0	83.0
	9 Prevalence of nonraised blood pressure age-standardised (rescaled)	47.7	47.9	59.0	60.2	60.2
	10 Percentage of people with diabetes receiving treatment	44.4	44.4	40.5	36.7	36.7
	11 Cervical cancer screening coverage (index)	34.1	52.2	58.3	65.1	65.1
	12 Tobacco non-smoking prevalence	79.1	82.2	80.5	80.7	80.7
Capacity	13 Hospital beds per 10 000 target population (index)	100.0	100.0	100.0	100.0	100.0
	14 Health worker density (index)	9.2	13.0	15.0	14.9	14.9
	15 Proportion of health facilities with essential medicines	85.4	90.8	84.7	81.9	81.9
	16 Environmental health services compliance rate				63.0	
	RMNCH	47.2	51.8	69.3	74.1	74.1
	Infectious	25.2	44.2	54.1	62.7	62.7
	NCDs	48.9	55.0	57.9	58.4	58.4
	Capacity	42.8	49.1	50.2	52.6	49.6
	UHC Index	39.7	49.8	57.5	61.5	60.5

Table 22: UHC service coverage index 3

Index 3: District level index (primarily routine data)		2007-2008	2012	2015	2016-2017	2018-2019	Example districts 2016-2017	
Tracer	Indicator	ZA	ZA	ZA	ZA	ZA	DC32	DC44
RMNCH	1 Couple year protection rate (index)	31.3	41.6	66.6	70.1	61.0	82.8	42.5
	2 Antenatal 1st visit coverage before 20 weeks (index)	29.2	32.0	45.8	51.4	55.0	70.1	29.2
	3 Immunisation under 1 year coverage (index)	74.8	78.0	79.4	76.9	81.9	95.0	73.6
	4 Pneumonia case fatality under 5 years rate (rescaled)	77.3	85.9	91.1	94.1	95.5	87.9	85.9
Infectious	5 Tuberculosis effective treatment coverage	50.6	51.8	55.1	55.6	ND	55.9	53.3
	6 Antiretroviral effective coverage (PLHIV on ART and virally suppressed)	ND	ND	ND	31.9	42.5	45.4	27.3
	7 Percentage of population sleeping under insecticide-treated nets	ND	ND	ND	ND	ND		
NCDs	8 Percentage of households with access to improved sanitation	64.4	ND	ND	75.6	ND	42.6	72.1
	9 Prevalence of nonraised blood pressure age-standardised (rescaled)	47.7	49.2	59.0	60.2	ND	74.0	69.2
	10 Percentage of people with diabetes receiving treatment	44.4	40.5	37.7	36.7	ND	50.3	25.9
	11 Cervical cancer screening coverage (index)	43.2	52.0	58.3	63.6	65.1	97.1	38.1
	12 Tobacco non-smoking prevalence	79.1	80.5	79.6	80.7	ND	89.9	88.3
Capacity	13 Hospital beds per 10 000 target population (index)	100.0	100.0	100.0	100.0	100.0	85.8	64.5
	14 Health worker density (index)	9.7	13.4	15.0	14.8	15.3	15.7	5.0
	15 Proportion of health facilities with essential medicines	63.8	84.7	77.2	81.9	62.6	88.2	85.2
	16 Environmental health services compliance rate	ND	ND	ND	63.0	62.3	60.0	71.0
	RMNCH	47.9	54.6	68.5	71.5	71.6	83.4	52.9
	Infectious	57.1	ND	ND	51.2	ND	47.6	47.2
	NCDs	51.9	53.7	56.7	58.0	ND	75.5	49.6
	Capacity	39.5	48.5	48.7	49.5	49.4	49.2	30.2
	UHC Index	46.1	52.2	57.4	56.9	ND	62.0	44.0

Note: Health worker density has only been calculated to district level by the authors between 2016 and 2019.

Table 23 contrasts the national values based on the 3 constructs – Index 1, Index 1 and Index 3. The most dramatic difference between the alternative constructs is in the trends over time for RMNCH. Household surveys, albeit infrequent, have consistently shown high coverage of these interventions, and yet poor impact indicators such as maternal and child mortality suggest that either the extent or quality of services provided cannot be adequate. The consistent increase in coverage suggested by routine health facility data may however exaggerate the change in health service coverage due to issues of data quality and increasing completeness of reporting as new data elements or information systems were rolled out. It is also difficult to construct a consistent time series as some routine indicators have only been collected in recent years.

Overall, the adapted South African UHC indices are lower than those reported by Hogan *et al.*, primarily due to the inclusion of more effective coverage indicators, where coverage is lower due to inclusion of a quality adjustment.³ In addition the composite health worker density index using the three professional cadres and the thresholds proposed by the GBD 2017 SDG Collaborators⁷⁹ was less than half that estimated based on the threshold for medical practitioners, as proposed by Hogan *et al.*, and was the lowest scoring indicator in the index.

Figure 24 shows how each of the components of Index 3 and the final index value varied between provinces and districts in 2016 and 2017. Figure 25 shows the combined sub-indices for each of the four components and the final value for Index 3, per district, stratified by socio-economic quintile (where SEQ1 is the most deprived and SEQ5 is the least deprived

quintile). For the measures of RMNCH, infection diseases and capacity and access, there was a clear trend towards higher scores in less deprived districts. This trend was partially reversed in relation to non-communicable diseases.

Gaps and limitations

This analysis has exposed a number of gaps and limitations in the UHC service coverage index, as globally applied. A country-specific index may address issues of data accessibility over time and disaggregation by geographic level, but that might hinder comparability with other countries. Engagement by country stakeholders is important, as the index matures and is applied more widely.

A number of critical areas are not included in the UHC service coverage index, such as mental health and injuries. An attempt has been made to improve the extent to which quality of care is reflected in the indicators chosen (where effective service coverage indicators would be used). As indicated, reflecting quality in the capacity index will be important, and the Ideal Clinic/Hospital and OHSC accreditation processes promise to deliver summary measures that may be useful in this regard. Overall, the lack of a consistent time series of data, using the same indicator definitions over time, hamper analysis, especially at the district level. As demonstrated with the pneumonia mortality, hypertension and diabetes data, the use of modelling can generate the necessary metrics from the range of available data sources.

Table 23: Comparison of UHC service coverage indices

		SA Universal health coverage: service coverage index				
Category	Series	1998-2002 & 2000	2003-2007 & 2005	2008-2011 & 2010	2012-2015 & 2015	2016-2017, 2016-2018, 2017
RMNCH	Index 1	78	80	84	86	87
	Index 2		47	52	69	74
	Index 3					71
Infectious	Index 1	4	25	43	53	59
	Index 2		25	44	54	63
	Index 3					51
NCDs	Index 1	27	49	54	57	57
	Index 2		49	55	58	58
	Index 3					58
Capacity	Index 1	40	39	48	47	49
	Index 2		43	49	50	50
	Index 3					50
UHC Index	Index 1	24	44	55	59	62
	Index 2		40	50	57	61
	Index 3					57
	GBD 2016	29	31	37		45
	WHO				67	

Another potential option would be to focus on amenable mortality. Neethling *et al.* have restated the data from the 2nd South African Burden of Disease study in amenable mortality terms for 45 causes of death.⁸⁰ The authors argued that these estimates were more appropriate than those based on Global Burden of Disease (GBD) data,⁸¹ as GBD mortality estimates had been shown to be inaccurate for South Africa.⁸²

The consensus report of the South African Lancet National Commission, entitled “Confronting the right to ethical and accountable quality health care in South Africa” was published in 2019.⁸³ The report cited the country’s health care access and quality (HAQ) index as evidence for the need for a comprehensive quality improvement plan of action, noting that “in practical terms the index of 49.7 means that in 2016, a combination of poor access and poor quality care resulted in the potentially preventable

deaths of more than 200 000 people in South Africa”. Finding 5 stated: “Health information system gaps constrain the country’s ability to measure or monitor quality and its improvements.” In detail, the report noted that “Numerous health measurement platforms exist that provide information on health system inputs, processes, service delivery, outcomes and impacts. However, most of these do not provide sufficient and appropriate information on health outcomes and impacts, nor are they sufficiently person-centred. Quality of care indicators focus primarily on structure, process and outputs in both the public and private health sectors. Data quality remains a significant barrier to the assessment of health system performance on the quality of care provided. Health information systems are partially electronic, are not interoperable, do not make available patient-level data, and are not capable of reporting aggregated data across public and private health sectors,

Figure 24: UHC service coverage index 3 by geographic level, 2016 to 2017

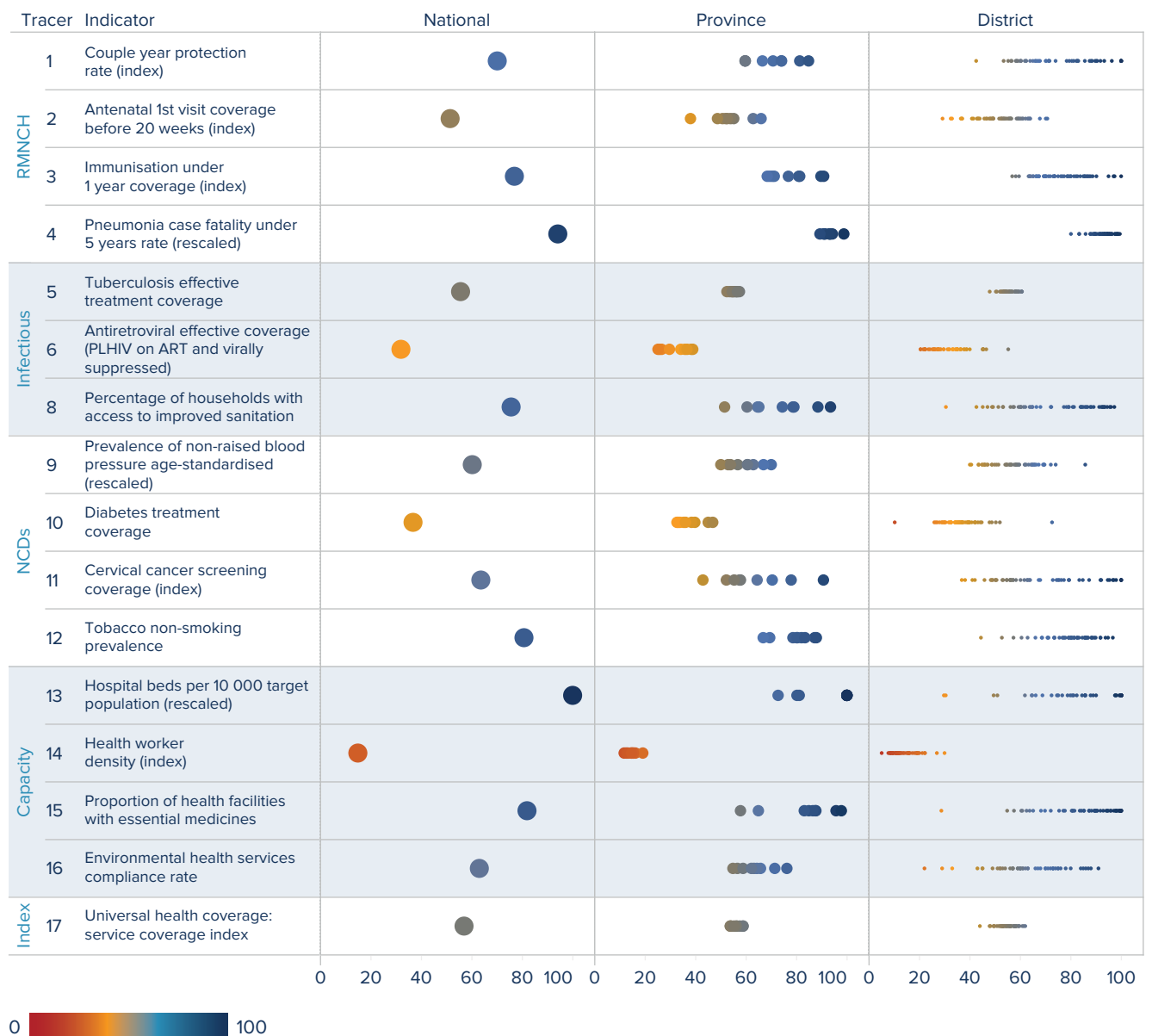


Figure 25: UHC service coverage index 3 by socio-economic quintile of districts, 2016 to 2017



or across levels or care pathways.” Recommendation 4 was therefore to: “Measure, monitor and evaluate to ensure a high-quality health system”, and to “Develop and enforce an integrated national health system performance dashboard”.

As stated, this analysis focused on SDG goal 3.8.1 and not that related to financial risk protection (3.8.2). By no means is this meant to infer that the latter goal is unimportant, but further work is needed to generate meaningful financial risk protection indicators for South Africa.

Conclusions and recommendations

The 2019 Global Monitoring Report on UHC was released in time for the United Nations General Assembly High-Level meeting in September 2019.⁶⁶ While noting global progress, the point was made that poorer countries are still lagging behind and that the overall pace of progress is slowing. The foreword to the report emphasised the value of disaggregated data in assessing progress to equity: “Having the right data, broken down in the right way, is giving us vital insights about who is being left behind and why, and highlighting where more investments are needed. We clearly must go beyond country averages that mask service delivery failures leaving those worst-off behind.”

The following recommendations are offered:

- NHI has the potential to improve the availability of data by entrenching a single payer system, which should result in harmonisation and interoperability of data systems. In the interim, the reporting of private sector data into the DHIS needs to be encouraged.
- The harmonisation of representative surveys, conducted on a regular basis, with disaggregation to the district level, should assist in delivering better data.
- Further research is needed on leveraging new technology or sources of data, and strengthening the triangulation of data from different sources, including through record linkage and modelling.
- Greater use of electronic health records and the Health Patient Registration System (HPRS) also hold great promise.
- Methods to incorporate equity in the analysis of coverage, based on routine data, such as the use of a deprivation index to describe socio-economic status per district, have been applied in the District Health Barometer. Assigning such status at the level of health facilities or per catchment area would allow for more nuanced assessments of those potentially left behind.

This chapter has shown that the UHC service coverage index can be applied in a way which reveals important lessons about the functioning of South Africa’s health care system, how it has changed over time, and how equity remains a challenge. Incorporating measures of quality of care is possible and revealing. Adapting the indicators to include a quality dimension and reflect ‘effective coverage’ has resulted in a lower overall index value than previously reported in the literature. However, this is a better indication of the actual performance of the health system.

Core tables and resources

This section includes some background resources for the UHC index, including tables with more details on the underlying values. A selection of other key indicators are also included for reference.

Key new references

The following major data sources were updated or released since the previous Review:

- Antenatal Survey summary results for 2017
- TB: Drug-sensitive and drug-resistant TB outcomes from the TB registers, as included into Tier.Net
- GBD 2015, 2016 and 2017 results published in various papers and on healthdata.org
- Global TB 2018 and 2019 reports
- HIV Household Survey 2017 summary results
- Ideal Clinic system status determinations
- WHO/UNICEF Immunization coverage estimates to 2019
- Insight Actuaries small area model of proportion of population coverage by medical schemes
- Thembisa HIV model version 4.2
- Stats SA Quarterly Labour Force surveys
- Council for Medical Schemes annual reports 2017-18 and 2018-19
- NICD Communiqués and Public Health Surveillance Bulletins
- National Income Dynamic Study (NiDS) wave 5 and updates to prior wave data sets
- Rapid Mortality Surveillance (RMS) 2017
- SADHS 2016 full report
- Saving Mothers 2014-2016
- Stats SA General Household Survey (GHS) 2018
- Stats SA Live births 2017 and 2018
- Stats SA mid-year population estimates 2019
- UNICEF Levels and Trends in Child Mortality Report 2019
- WHO Trends in maternal mortality 2000 to 2017
- World Health Statistics 2019
- Competition commission Health Market Inquiry reports
- UNAIDS Data 2018 and 2019

UHC service coverage index

Table 24: UHC indicator definitions

	Tracer	Type	Indicator	Definition
Reproductive, maternal, newborn and child health	1	eff_coverage	Demand for family planning satisfied with modern methods	Percentage of women of reproductive age (15-49 years) who are sexually active and who have their need for family planning satisfied with modern methods.
		proxy	Contraceptive prevalence rate (any method)	Percentage of women of reproductive age (15-49) who are using (or whose partner is using) a modern contraceptive method. Contraceptive methods include female and male sterilisation, injectable and oral hormones, intrauterine devices, diaphragms, spermicides and condoms, natural family planning and lactational amenorrhoea.
			Couple year protection rate (index)	Values capped at 100. Values of zero or missing set to 1. Women protected against pregnancy by using modern contraceptive methods, including sterilisations, as proportion of female population 15-49 year. Couple year protection is the total of (Oral pill cycles / 15) + (Medroxyprogesterone injection / 4) + (Norethisterone enanthate injection / 6) + (IUCD x 4.5) + (Sub dermal implant x 2.5) + Male condoms distributed / 120) + (Female condoms distributed / 120) + (Male sterilisation x 10) + (Female sterilisation x 10).
	2	coverage	Antenatal 1st visit coverage (index)	The proportion of pregnant women coming for at least one antenatal visit. Any implausible values (>100) capped at 100, zero or missing values set to 1.
			Antenatal care coverage	Proportion of pregnant women receiving some antenatal care.
			Delivery in facility rate (index)	The proportion of deliveries taking place in health facilities under supervision of trained personnel. The number of children under one year, factorised by 1.07 due to infant mortality, is used as an estimated proxy denominator for expected deliveries per year. Any implausible values (>100) capped at 100, missing values set to 1.
		eff_coverage	Antenatal 1st visit coverage before 20 weeks (index)	Calculated as the product of 2 DHIS indicators 'ANC 1st visit coverage' and 'ANC 1st visit before 20 weeks rate' to estimate the proportion of pregnant women who attend ANC clinics before 20 weeks gestation.
			Births attended by skilled health personnel	Percentage of women who gave birth in the 5 years preceding the survey who reported receiving medical assistance at delivery from either a doctor, a nurse or a midwife.
	3	coverage	DTaP-IPV-Hib-HBV 3rd dose coverage	Children under 1 year who received DTaP-IPV-Hib-HBV 3rd dose, normally at 14 weeks as a proportion of population under 1 year. Both Pentaxim and Hexavalent will form part of the numerator to ensure accurate coverage of historical data.
			DTP3 coverage	The proportion of children who received their third DTP doses (normally at 14 weeks).
		Immunisation coverage of children 12-23 months	Proportion of children aged 12 to 23 months who had received BCG, 3 doses of DTP and polio, and Measles vaccine, but not necessarily Hepatitis B.	
		Immunisation under 1 year coverage (index)	The proportion of all children in the target area under one year who complete their primary course of immunisation. Any implausible values (>100) capped at 100, missing values set to 1.	
4	coverage	Percentage of children under 5 years of age with suspected pneumonia taken to a health facility	Percentage of children under 5 years of age with suspected pneumonia (cough and difficult breathing NOT due to a problem in the chest and a blocked nose) in the two weeks preceding the survey taken to an appropriate health facility or provider.	
	proxy	Pneumonia case fatality under 5 years rate (rescaled)	The smoothed estimates of the pneumonia CFR were generated from the DHIS indicator using a generalised additive model with thin-plate splines, after removing outlier values. The smoothed CFR was then rescaled according to the maximum observed value according to the formula: $\text{index} = (\text{max risk value} - \text{minimum}) / (100 - \text{minimum}) * 100$	
Infectious diseases	5	eff_coverage	Tuberculosis effective treatment coverage	The percentage of incident TB cases that are detected and successfully treated in a year. Combination of the case notification rate and the successful treatment rate. Currently calculated using drug-sensitive TB outcomes. DR TB should ideally also be included in the calculation.
	6	coverage	Antiretroviral coverage (2nd 90)	The number of patients receiving ART, divided by the number needing treatment. The denominator has changed over time, due to changes in treatment guidelines affecting the criteria for treatment eligibility. The latest definition is that all HIV-infected patients should be on ART. This indicator is also one of the 90-90-90 global targets for AIDS (UNAIDS).
			Clients remaining on ART rate	Percentage of estimated people living with HIV who remain on ART. (Routine data equivalent for Antiretroviral coverage)
			HIV viral load suppression (3rd 90)	Percentage of people on ART who are virologically suppressed (VL level <= 1000 copies/mL). This indicator is also one of the 90-90-90 global targets for AIDS (UNAIDS).
		eff_coverage	Antiretroviral effective coverage (PLHIV on ART and virally suppressed)	Proportion of HIV-positive people on ART and virally suppressed. Any implausible values (>100) capped at 100, zero or missing values set to 1.
8	coverage	Percentage of households with access to improved sanitation	Percentage of households using improved sanitation facilities (including flush to piped sewer system, flush to septic tank, flush/pour flush to pit, flush/pour flush to elsewhere).	

Table 24 (cont.)

	Tracer	Type	Indicator	Definition
Non-communicable diseases	9	coverage	Hypertension control (of treated)	Percentage of hypertensives on treatment who are controlled (BP measurements below threshold).
			Hypertension treatment coverage	Percentage of people with hypertension who report being on treatment.
		eff_coverage	Hypertension effective treatment coverage (% hypertensives controlled)	Percentage of all hypertensives who are controlled (BP measurements below threshold) - effective treatment coverage.
	proxy	Prevalence of non-raised blood pressure	The prevalence of normal blood pressure, regardless of treatment status, is the sum of those who do not have hypertension and those whose hypertension is controlled by medication.	
		Prevalence of non-raised blood pressure age-standardised	Percentage of population 15 years and older with non-raised blood pressure, regardless of treatment status, age-standardised (Census 2011 population).	
		Prevalence of non-raised blood pressure age-standardised (rescaled)	Percentage of population 15 years and older with non-raised blood pressure, regardless of treatment status, age-standardised (Census 2011 population). Rescaled using the minimum observed value in the dataset using formula $(x-\min)/(100-\min)*100$.	
			Metadata used a minimum of 50, but we have a value below that at district level.	
	10	coverage	Diabetes treatment coverage	Percentage of people with diabetes receiving treatment.
		eff_coverage	Percentage of diabetics treated and controlled	Percentage of people with diabetes receiving treatment and controlled on treatment.
		proxy	Mean fasting plasma glucose (rescaled)	Mean fasting plasma glucose, which is a continuous measure (units of mmol/L), is converted to a scale of 0 to 100 using the minimum theoretical biological risk (5.1 mmol/L) and observed maximum across countries (7.1 mmol/L).
11	coverage	Cervical cancer screening coverage (index)	Women 30 years and older with a cervical (pap) smear done for screening purposes according to the national policy of screening all women in this age category every 10 years, as the proportion of all women 30 years and older in the target population. Any implausible values (>100) capped at 100, missing values set to 1.	
		Cervical cancer screening effective coverage	Percentage of eligible women (aged 25 to 64) who report that they have had a pelvic exam and Pap smear in the past three years.	
12	proxy	Tobacco non-smoking prevalence	Percentage of adults 15+ years who are non-smokers, or who have not smoked tobacco in the previous 30 days. Calculated as $(100 - \text{smoking prevalence})$.	
13	proxy	Hospital beds per 10 000 target population (rescaled)	Number of inpatient beds per 10 000 target population. For public sector beds, the uninsured population is used as the target. Rescaled as $x/18*100$, >18 per 10 000=100.	
		Percentage Ideal clinics	Percentage of fixed PHC facilities assessed on the ideal clinic dashboard that achieved Ideal Clinic status (silver, gold, platinum or diamond status).	
14	proxy	Health worker density (index)	An indicator based on SDG indicator 3.c.1 with a modified scaling approach as described by Lozano et al. 2018. Medical practitioners, professional nurses and pharmacists per uninsured population were rescaled from 0-100 against thresholds of 30, 100 and 5 per 10 000. The index was calculated as the geometric mean of the 3 scaled scores.	
		Medical practitioners per 100 000 population (Hogan index)	The ratio of medical practitioners per uninsured population rescaled from 0-100 against a threshold of 0.9 per 1000 as described by Hogan et al. 2018.	
15	proxy	Proportion of health facilities with essential medicines	Proportion of health facilities with availability of the WHO-recommended core list of essential medicines. Calculated as $(100 - \text{tracer items stock-out rate})$ after implausible values (>100) capped at 100, zero or missing values set to 1.	
16	proxy	Environmental health services compliance rate	The compliance of a municipality with National Environmental health normas and standards in rendering Environmental Health Services. The compliance is determined by assessing the municipality against elements in the audit tool and providing a subsequent score.	
		International Health Regulations (IHR) core capacity index	Percentage of attributes of 13 core capacities that have been attained at a specific point in time. The 13 core capacities are: (1) National legislation, policy and financing; (2) Coordination and National Focal Point communications; (3) Surveillance; (4) Response; (5) Preparedness; (6) Risk communication; (7) Human resources; (8) Laboratory; (9) Points of entry; (10) Zoonotic events; (11) Food safety; (12) Chemical events; (13) Radionuclear emergencies.	
Overall UHC service coverage index	17	index	Universal health coverage: service coverage index	Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, noncommunicable diseases and service capacity and access, among the general and the most disadvantaged population).
				Calculated as the geometric mean of the index score for each of the 4 categories of the index.

Table 25: UHC index trends by province

			Calyear (group) / Geo																							
			2003-2007												2008-2011											
Indicator		Series, Age, Sex, Category	ZA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	ZA	EC	FS	GP	KZ	LP	MP	NC	NW	WC				
RMNCH	1	Couple year protection rate (index)	DHIS	30.1	29.2	31.9	21.5	25.3	36.0	24.4	30.1	26.4	61.3	34.7	34.3	36.8	24.6	30.1	38.9	34.2	35.0	26.2	69.2			
	2	Antenatal 1st visit coverage before 20 weeks (index)	DHIS	28.7	24.1	38.4	25.5	30.7	32.5	31.0	45.5	26.8	35.7	32.1	26.4	39.8	33.9	29.3	35.5	30.9	47.2	31.8	42.9			
	3	Immunisation under 1 year coverage (index)	DHIS	76.6	71.5	99.0	78.2	70.3	87.4	72.5	89.9	69.4	97.1	77.0	70.5	93.4	98.6	75.6	82.1	71.4	90.5	67.5	94.8			
	4	Pneumonia case fatality under 5 years rate (index)	DHIS smoothed	74.8	65.0	66.8	75.5	80.5	65.1	61.0	82.2	64.4	97.7	84.0	80.9	79.5	87.4	86.9	78.4	75.7	87.6	81.0	98.4			
Infectious	5	Tuberculosis effective treatment coverage	ETR	44.8	45.3	47.9	48.3	41.9	41.4	42.9	47.0	40.0	51.5	56.6	54.4	55.0	60.5	56.9	49.3	56.7	56.1	50.8	61.1			
	6	Antiretroviral effective coverage (PLHIV on ART and virally suppressed)	THEMBISA 4.2, all ages, both sexes	5.2	4.5	3.1	5.5	5.5	4.0	3.4	7.0	5.2	10.0	20.2	17.6	20.3	18.3	23.5	19.2	15.8	16.0	18.7	24.6			
	8	Percentage of households with access to improved sanitation	GHS 2018	68.3	49.4	71.8	89.8	63.0	34.6	55.3	76.9	57.8	95.2	75.4	63.6	83.4	91.3	72.7	41.1	55.4	83.7	66.5	96.7			
NCDs	9	Prevalence of nonraised blood pressure regardless of treatment status age-standardised (index)	NiDS, 15+ years, both sexes, age-standardised	47.7	43.7	47.1	49.6	48.3	61.2	44.8	38.8	38.8	41.3	47.9	46.0	47.1	49.6	48.3	61.2	59.2	41.2	54.6	41.3			
	10	Percentage of people with diabetes receiving treatment	NiDS modelled, 15+ years, both sexes	44.4	47.2	40.5	49.5	54.6	34.1	39.3	52.1	57.9	71.0	44.4	47.2	40.5	49.5	54.6	34.1	39.4	52.1	57.9	71.0			
	11	Cervical cancer screening coverage (index)	DHIS	34.1	25.6	35.0	35.2	39.3	51.8	27.9	33.6	36.1	33.7	52.2	39.3	44.9	45.4	78.4	60.3	53.1	36.8	51.3	58.8			
	12	Adults aged at least 15 years who had not smoked tobacco in the previous 30 days	NiDS, 15+ years, both sexes	79.1	82.6	76.3	79.0	83.4	85.0	82.7	65.0	78.5	63.2	82.2	84.6	83.1	80.8	86.9	91.6	83.1	70.3	83.2	64.7			
Capacity	13	Hospital beds per 10 000 target population (index)	DHIS, public sector	100.0	100.0	100.0	100.0	100.0	100.0	93.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.8	83.4	100.0	95.1	100.0			
	14	Health worker density (index)	public sector	9.2	7.8	9.6	8.8	10.2	8.7	8.0	10.8	7.9	11.8	13.0	11.4	10.1	14.4	12.5	11.7	12.5	15.3	9.3	16.3			
	15	Proportion of health facilities with essential medicines	DHIS	85.4	63.3	99.2	98.9	100.0	99.8	99.0	92.0	100.0	54.0	90.8	92.1	87.4	83.1	100.0	86.5	97.8	87.5	100.0	100.0			
	16	Environmental health services compliance rate	NDoH																							
RMNCH			47.2	42.5	53.3	42.4	45.8	50.8	42.8	56.4	42.2	67.5	51.8	47.7	57.4	51.8	49.1	54.6	48.9	60.2	46.2	72.5				
Infectious			25.2	21.6	22.0	28.8	24.4	17.9	20.0	29.4	22.9	36.6	44.2	39.3	45.3	46.6	46.0	33.9	36.8	42.2	39.8	52.6				
NCDs			48.9	45.7	47.5	51.1	54.2	55.0	44.9	45.9	50.2	50.0	55.0	51.8	51.7	54.8	65.1	58.3	56.6	48.5	60.6	57.8				
Capacity			42.8	36.8	45.7	44.4	46.7	44.2	42.0	46.4	42.8	39.9	49.1	47.1	44.5	49.3	50.0	45.8	46.7	51.1	44.6	54.7				
UHC Index			39.7	35.2	40.0	40.8	41.0	38.6	35.7	43.3	38.0	47.1	49.8	46.3	49.5	50.5	52.1	47.1	46.7	50.1	47.2	58.9				



Table 25 (cont.)

			Calyear (group) / Geo 2012-2015										
Indicator		Series, Age, Sex, Category	ZA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	
RMNCH	1	Couple year protection rate (index)	DHIS	66.6	72.0	78.7	61.3	83.3	68.6	52.7	51.7	56.4	89.1
	2	Antenatal 1st visit coverage before 20 weeks (index)	DHIS	45.8	34.9	47.0	47.5	45.6	47.8	53.5	57.7	44.2	52.1
	3	Immunisation under 1 year coverage (index)	DHIS	82.9	73.1	84.6	98.2	80.1	79.7	85.9	98.9	76.5	87.1
	4	Pneumonia case fatality under 5 years rate (index)	DHIS smoothed	91.1	87.6	89.2	92.4	91.5	87.7	86.6	92.2	88.8	98.7
Infectious	5	Tuberculosis effective treatment coverage	ETR	55.1	56.1	54.4	57.7	56.3	51.7	57.1	50.4	47.7	56.2
	6	Antiretroviral effective coverage (PLHIV on ART and virally suppressed)	THEMBISA 4.2, all ages, both sexes	36.2	31.3	37.0	31.2	43.5	34.2	35.6	37.0	31.4	36.4
	8	Percentage of households with access to improved sanitation	GHS 2018	79.5	78.2	83.8	91.1	75.9	54.0	64.4	84.6	72.2	95.5
NCDs	9	Prevalence of nonraised blood pressure regardless of treatment status age-standardised (index)	NiDS, 15+ years, both sexes, age-standardised	59.0	54.0	57.9	61.2	60.2	67.9	63.3	44.2	59.8	54.0
	10	Percentage of people with diabetes receiving treatment	NiDS modelled, 15+ years, both sexes	40.5	41.5	36.5	43.9	44.8	33.6	39.6	49.4	51.4	52.8
	11	Cervical cancer screening coverage (index)	DHIS	58.3	60.3	59.0	46.3	83.1	58.0	67.8	35.2	67.2	57.4
	12	Adults aged at least 15 years who had not smoked tobacco in the previous 30 days	NiDS, 15+ years, both sexes	80.5	82.6	77.7	79.5	85.4	87.8	87.0	67.6	84.5	65.8
Capacity	13	Hospital beds per 10 000 target population (index)	DHIS, public sector	100.0	100.0	100.0	100.0	100.0	85.2	72.7	100.0	86.5	100.0
	14	Health worker density (index)	public sector	15.0	13.6	14.0	15.3	15.1	14.1	12.0	19.0	11.3	17.3
	15	Proportion of health facilities with essential medicines	DHIS	84.7	86.3	86.2	88.4	97.1	70.5	84.8	91.1	73.9	100.0
	16	Environmental health services compliance rate	NDoH										
	RMNCH		69.3	63.4	72.7	71.7	72.6	69.2	67.7	72.2	64.1	79.5	
	Infectious		54.1	51.6	55.3	54.7	57.1	45.7	50.8	54.0	47.7	58.0	
	NCDs		57.9	57.8	55.8	56.1	66.1	58.4	62.0	47.8	64.6	57.3	
	Capacity		50.2	49.0	49.5	51.3	52.7	43.9	42.0	55.7	41.7	55.8	
	UHC Index		57.5	55.2	57.7	58.0	61.7	53.4	54.7	56.8	53.6	62.0	



Table 25 (cont.)

Calyear (group) / Geo

			2016-2018										2016-2018 (Including EHS in index calculation)										
Series, Age, Sex, Category			ZA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	ZA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	
Indicator																							
RMNCH	1	Couple year protection rate (index)	DHIS	70.1	74.0	76.6	59.7	74.1	84.8	70.7	60.8	59.7	81.3	70.1	74.0	76.6	59.7	74.1	84.8	70.7	60.8	59.7	81.3
	2	Antenatal 1st visit coverage before 20 weeks (index)	DHIS	55.0	40.5	51.6	57.5	54.8	57.6	66.5	63.1	53.9	59.1	55.0	40.5	51.6	57.5	54.8	57.6	66.5	63.1	53.9	59.1
	3	Immunisation under 1 year coverage (index)	DHIS	81.9	71.9	74.8	84.4	90.8	71.0	96.8	90.8	69.4	82.7	81.9	71.9	74.8	84.4	90.8	71.0	96.8	90.8	69.4	82.7
	4	Pneumonia case fatality under 5 years rate (index)	DHIS smoothed	95.5	90.0	94.9	93.8	94.1	93.0	93.0	95.2	91.7	98.8	95.5	90.0	94.9	93.8	94.1	93.0	93.0	95.2	91.7	98.8
Infectious	5	Tuberculosis effective treatment coverage	ETR	55.6	56.6	54.5	57.4	56.4	55.2	55.9	52.4	53.6	54.6	55.6	56.6	54.5	57.4	56.4	55.2	55.9	52.4	53.6	54.6
	6	Antiretroviral effective coverage (PLHIV on ART and virally suppressed)	THEMBISA 4.2, all ages, both sexes	53.4	47.1	58.8	46.0	60.4	55.4	57.1	61.5	44.0	51.1	53.4	47.1	58.8	46.0	60.4	55.4	57.1	61.5	44.0	51.1
	8	Percentage of households with access to improved sanitation	GHS 2018	83.0	88.0	85.5	91.8	81.4	59.3	68.1	90.0	71.7	94.3	83.0	88.0	85.5	91.8	81.4	59.3	68.1	90.0	71.7	94.3
NCDs	9	Prevalence of nonraised blood pressure regardless of treatment status age-standardised (index)	NiDS, 15+ years, both sexes, age-standardised	60.2	60.6	53.8	62.9	56.7	66.9	70.0	50.0	60.6	52.9	60.2	60.6	53.8	62.9	56.7	66.9	70.0	50.0	60.6	52.9
	10	Percentage of people with diabetes receiving treatment	NiDS modelled, 15+ years, both sexes	36.7	36.0	32.6	38.4	35.3	33.1	39.7	46.8	45.0	33.8	36.7	36.0	32.6	38.4	35.3	33.1	39.7	46.8	45.0	33.8
	11	Cervical cancer screening coverage (index)	DHIS	65.1	71.6	60.6	52.2	90.7	57.4	89.9	46.0	70.4	57.8	65.1	71.6	60.6	52.2	90.7	57.4	89.9	46.0	70.4	57.8
	12	Adults aged at least 15 years who had not smoked tobacco in the previous 30 days	NiDS, 15+ years, both sexes	80.7	83.4	80.3	78.6	87.2	87.9	82.0	66.8	80.2	69.4	80.7	83.4	80.3	78.6	87.2	87.9	82.0	66.8	80.2	69.4
Capacity	13	Hospital beds per 10 000 target population (index)	DHIS, public sector	100.0	100.0	100.0	100.0	100.0	81.1	72.7	100.0	80.2	100.0	100.0	100.0	100.0	100.0	100.0	81.1	72.7	100.0	80.2	100.0
	14	Health worker density (index)	public sector	14.9	15.3	13.1	15.4	15.1	14.5	12.5	19.8	12.3	16.1	14.9	15.3	13.1	15.4	15.1	14.5	12.5	19.8	12.3	16.1
	15	Proportion of health facilities with essential medicines	DHIS	81.9	83.1	64.9	86.5	87.7	57.8	84.9	87.5	97.8	95.7	81.9	83.1	64.9	86.5	87.7	57.8	84.9	87.5	97.8	95.7
	16	Environmental health services compliance rate	NDoH	Excluding EHS in index calculation										63.0	66.9	76.2	71.4	58.8	64.2	64.3	75.2	65.8	68.3
RMNCH			74.1	66.4	72.8	72.2	76.8	75.4	80.7	75.9	67.3	79.2	74.1	66.4	72.8	72.2	76.8	75.4	80.7	75.9	67.3	79.2	
Infectious			62.7	61.7	65.0	62.3	65.2	56.6	60.1	66.2	55.3	64.1	62.7	61.7	65.0	62.3	65.2	56.6	60.1	66.2	55.3	64.1	
NCDs			58.4	60.1	54.1	56.1	63.1	57.8	67.3	51.8	62.6	51.7	58.4	60.1	54.1	56.1	63.1	57.8	67.3	51.8	62.6	51.7	
Capacity			49.6	50.3	43.9	51.0	51.0	40.8	42.6	55.8	45.8	53.6	49.6	50.3	43.9	51.0	51.0	40.8	42.6	55.8	45.8	53.6	
UHC Index			60.5	59.3	57.9	59.9	63.3	56.3	61.1	61.7	57.2	61.2	60.5	59.3	57.9	59.9	63.3	56.3	61.1	61.7	57.2	61.2	



Demographic indicators

Table 26: Demographic indicators by province

Indicator	Period	Sex(Age)Series(Cat)	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	Ref	
Adolescent fertility rate (per 1000 girls aged 15–19 years)	2009-2017	female 15-19 years WHO	71,0										a	
Area (square km)	2016	2016 boundaries	1 220 809	168 965	129 825	18 178	94 359	125 754	76 495	372 889	104 882	129 462	b	
Crude death rate (deaths per 1 000 population)	2016	both sexes all ages mid-	9,3										c	
		both sexes all ages vital registration unadjusted	8,2	9,4	11,1	7,2	7,6	7,9	7,7	11,6	9,3	7,6	d	
	2017	both sexes all ages mid-	9,3										c	
	2018	both sexes all ages mid-	9,2										c	
	2019	both sexes all ages mid-	9,2										c	
Live birth occurrences registered	2014	total	1 008 740										e	
	2015	total	952 242										e	
	2016	0-30 days	732 672	85 590	41 848	171 115	126 671	98 525	59 796	20 719	48 118	80 279	e	
		current	876 435											e
		total	893 990											e
2017	total	989 318	115 893	50 130	239 457	197 913	122 947	79 782	24 395	58 038	99 965			
Population	2002	both sexes all ages mid-	46 355 083	6 535 846	2 723 764	9 752 352	9 645 728	5 272 333	3 517 519	1 031 910	3 053 052	4 822 578	c	
	2002/03	both sexes all ages DHIS 2002-2021	45 996 150	6 120 710	2 678 078	10 301 148	9 187 424	4 905 955	3 573 389	1 060 861	3 082 947	5 085 638	g	
	2003	both sexes all ages mid-	46 806 354	6 524 928	2 721 204	9 976 764	9 691 186	5 285 619	3 565 618	1 041 705	3 088 779	4 910 550	c	
	2003/04	both sexes all ages DHIS 2002-2021	46 564 086	6 167 263	2 682 956	10 496 213	9 291 817	4 950 698	3 621 419	1 070 651	3 123 785	5 159 284	g	
	2004	both sexes all ages mid-	47 310 050	6 524 920	2 720 856	10 210 656	9 746 699	5 304 765	3 616 255	1 052 943	3 129 161	5 003 794	c	
	2004/05	both sexes all ages DHIS 2002-2021	47 152 955	6 219 216	2 689 045	10 692 025	9 401 705	5 000 073	3 670 787	1 080 411	3 166 069	5 233 624	g	
	2005	both sexes all ages mid-	47 860 360	6 533 458	2 722 536	10 455 302	9 810 366	5 328 028	3 668 754	1 065 561	3 173 726	5 102 628	c	
	2005/06	both sexes all ages DHIS 2002-2021	47 763 433	6 274 533	2 696 249	10 892 431	9 516 714	5 052 860	3 721 247	1 090 114	3 209 815	5 309 470	g	
	2006	both sexes all ages mid-	48 446 414	6 547 453	2 725 755	10 710 278	9 879 479	5 353 312	3 722 283	1 079 417	3 221 779	5 206 658	c	
	2006/07	both sexes all ages DHIS 2002-2021	48 396 330	6 329 424	2 704 511	11 105 339	9 635 403	5 105 923	3 772 175	1 099 646	3 255 051	5 388 858	g	
	2007	both sexes all ages mid-	49 088 699	6 556 945	2 732 634	10 997 682	9 954 771	5 384 537	3 777 928	1 092 099	3 275 374	5 316 729	c	
	2007/08	both sexes all ages DHIS 2002-2021	49 052 270	6 387 451	2 714 448	11 323 576	9 758 516	5 162 016	3 824 189	1 109 198	3 301 893	5 470 983	g	
	2016	both sexes all ages CS	55 653 654	6 996 976	2 834 714	13 399 724	11 065 240	5 799 090	4 335 964	1 193 780	3 748 435	6 279 730	h	
		both sexes all ages mid-	56 252 335	6 674 613	2 847 866	14 085 143	10 916 303	5 829 258	4 379 046	1 217 485	3 832 000	6 470 621	c	
	2016/17	both sexes all ages DHIS 2002-2021	56 114 848	7 081 125	2 866 638	13 567 017	11 117 288	5 822 433	4 343 264	1 193 914	3 804 874	6 318 295	g	

Table 26 (cont.)

Indicator	Period	Sex Age Series Cat	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	Ref	
	2017	both sexes all ages mid-	57 097 857	6 692 944	2 863 006	14 446 408	11 036 317	5 883 077	4 448 608	1 233 048	3 897 470	6 596 979	c	
	2017/18	both sexes all ages DHIS 2002-2021	56 935 244	7 158 598	2 886 588	13 840 125	11 267 436	5 896 445	4 403 140	1 202 934	3 861 905	6 418 073	g	
	2018	both sexes all ages mid-	57 939 227	6 703 968	2 875 816	14 811 270	11 162 019	5 933 282	4 520 308	1 248 608	3 962 741	6 721 215	c	
	2018/19	both sexes all ages DHIS 2002-2021	57 741 900	7 235 448	2 905 959	14 104 252	11 417 132	5 970 482	4 462 362	1 211 736	3 918 946	6 515 583	g	
	2019	both sexes all ages mid-	58 775 022	6 712 276	2 887 465	15 176 116	11 289 086	5 982 584	4 592 187	1 263 875	4 027 160	6 844 272	c	
	2019/20	both sexes all ages DHIS 2002-2021	58 535 663	7 311 626	2 924 685	14 361 347	11 565 963	6 044 413	4 520 629	1 220 189	3 975 891	6 610 920	g	
Public sector dependent (uninsured) population	2016	both sexes all ages GHS	46 124 843	6 306 098	2 398 021	9 759 199	9 761 216	5 310 569	3 657 414	981 961	3 222 010	4 770 246	i	
		both sexes all ages non med scheme	47 099 377	6 418 080	2 476 376	10 117 149	9 835 132	5 398 547	3 768 727	1 010 092	3 310 104	4 995 841	j	
	2017	both sexes all ages GHS	46 969 699	5 855 329	2 439 562	10 709 025	9 679 375	5 307 963	3 826 456	1 016 118	3 258 489	4 895 746	k	
		both sexes all ages non med scheme	47 643 819	5 860 266	2 478 961	10 798 890	9 821 656	5 375 464	3 898 605	1 034 405	3 394 963	5 201 166	l	
	2018	both sexes all ages GHS	46 969 699	5 855 329	2 439 562	10 709 025	9 679 375	5 307 963	3 826 456	1 016 118	3 258 489	4 895 746	k	
		both sexes all ages GHS model	48 587 394	5 868 952	2 501 035	11 052 005	9 955 624	5 434 186	3 959 472	1 044 246	3 457 711	5 314 165	m	
		both sexes all ages non med scheme	47 747 441	5 863 832	2 460 452	10 995 558	9 802 101	5 367 894	3 894 676	1 029 338	3 316 809	5 000 996	k	
	2019	both sexes all ages GHS	49 135 918	6 041 048	2 419 696	11 549 024	9 889 239	5 492 012	4 013 571	1 060 391	3 483 493	5 126 360	n	
		both sexes all ages non med scheme	49 902 986	6 087 000	2 505 744	11 645 912	10 056 905	5 572 145	4 040 499	1 082 364	3 569 827	5 537 253	o	
	Total fertility rate	2013-2016	SADHS	2,6	2,9	2,4	2,6	2,5	3,1	3,0	2,7	3,1	3,1	p
SADHS SEQ1 (poorest)			3,1											p
SADHS SEQ2			2,9											p
SADHS SEQ3			2,7											p
SADHS SEQ4			2,3											p
SADHS SEQ5 (wealthiest)			2,1											p
2016		mid-year	2,4											c
2017		mid-year	2,3											c
2018	mid-year	2,3											c	

Notes:

- a World Health Statistics 2019
b Demarcation Board
c Stats SA MYE 2019
d Stats SA Causes of death 2016
e Stats SA Live Births 2016. 0-30 = registered within 30 days. Current = registered in the year of birth. Total = all registration by year of birth as at cutoff date.
f Stats SA Live Births 2017
g DHIS Pop Est 2002-21
h Community Survey 2016
i Stats SA GHS 2015. Calculated using provincial medical scheme coverage (GHS 2015) and Stats SA mid-year estimates for 2016.
j Medical Schemes 2015-16. Calculated from total number of beneficiaries subtracted from total population (Stats SA 2016 mid-year estimates)
k Stats SA GHS 2017. Calculated using provincial medical scheme coverage (GHS 2017) and Stats SA mid-year estimates for relevant year.
l Medical Schemes 2016-17. Calculated from total number of beneficiaries subtracted from total population (Stats SA 2017 mid-year estimates)
m Insight med schemes 2019
n Stats SA GHS 2018. Calculated using provincial medical scheme coverage (GHS 2018) and Stats SA mid-year 2019.
o Medical Schemes 2017-18
p SADHS 2016 Full Report

Table 27: DHIS population estimates by age group, by province, 2019/20

Age groups	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC
00-04 years	5 832 673	826 611	286 697	1 267 753	1 323 674	662 946	441 617	103 587	395 100	542 688
05-09 years	5 846 085	853 626	277 124	1 193 161	1 353 017	665 149	446 924	108 677	406 570	541 837
10-14 years	5 611 858	825 800	270 305	1 132 710	1 293 896	621 489	441 803	113 640	388 793	523 422
15-19 years	5 003 880	685 992	251 232	1 077 656	1 084 290	547 918	412 703	108 391	334 256	501 442
20-24 years	5 047 420	636 143	262 807	1 153 924	1 018 049	567 146	422 327	108 353	335 349	543 322
25-29 years	5 529 962	729 208	278 423	1 309 830	1 089 278	609 562	449 605	113 183	368 188	582 685
30-34 years	5 308 281	672 755	271 122	1 308 780	1 004 127	562 275	433 879	109 832	361 882	583 629
35-39 years	4 273 214	478 021	215 723	1 143 961	775 789	426 435	341 816	87 895	292 980	510 594
40-44 years	3 595 552	338 464	177 474	1 083 119	606 043	327 198	273 738	73 381	247 723	468 412
45-49 years	2 988 932	265 561	148 186	939 192	478 294	247 982	217 602	63 201	204 008	424 906
50-54 years	2 509 810	233 455	129 419	767 490	392 329	201 482	177 889	56 010	174 061	377 675
55-59 years	2 075 595	207 278	107 760	619 286	335 103	166 965	141 862	46 516	144 689	306 136
60-64 years	1 699 534	183 437	90 643	500 667	274 651	137 369	110 658	40 347	116 734	245 028
65-69 years	1 280 523	138 586	70 478	366 682	214 802	109 979	84 058	31 978	82 170	181 790
70-74 years	894 974	97 759	48 642	249 329	157 957	76 639	54 402	23 149	55 254	131 843
75-79 years	565 680	72 080	30 951	147 974	92 175	50 848	34 771	16 382	37 796	82 703
80+ years	471 690	66 850	25 699	99 833	72 489	63 031	34 975	15 667	30 338	62 808
Total	58 535 663	7 311 626	2 924 685	14 361 347	11 565 963	6 044 413	4 520 629	1 220 189	3 975 891	6 610 920

Socio-economic indicators

Table 28: Socio-economic indicators by province

Indicator	Period	Sex Age Series Cat	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	Ref	
Percentage of households with access to improved sanitation	2016	CS	75.6	74.4	79.0	88.5	65.1	51.5	60.4	78.6	64.6	93.5	a	
		GHS 2018	81.0	85.1	83.2	90.5	77.2	57.1	67.5	82.6	69.0	94.3	b	
	2017	GHS 2018	82.4	85.8	85.2	90.7	81.1	59.3	67.8	88.1	71.7	94.2	b	
	2018	GHS 2018	83.0	88.0	85.5	91.8	81.4	58.9	68.1	90.0	70.6	93.8	b	
Unemployment rate (official definition)	2017 Q1	both sexes 15-64 years LFS	27.7	32.2	35.5	29.2	25.8	21.6	31.5	30.7	26.5	21.5	e	
	2017 Q4	both sexes 15-64 years LFS	26.7	35.1	32.6	29.1	24.1	19.6	28.9	27.1	23.9	19.5	f	
	2018 Q4	both sexes 15-64 years LFS	27.1	36.1	32.9	29.0	25.6	16.5	32.0	25.0	26.6	19.3	g	
	2019 Q1	both sexes 15-64 years LFS	27.6	37.4	34.9	28.9	25.1	18.5	34.2	26.0	26.4	19.5	h	
	2019 Q2	both sexes 15-24 years LFS	56.4											i
		both sexes 15-64 years LFS	29.0	35.4	34.9	31.1	26.1	20.3	34.7	29.4	33.0	20.4		i
		both sexes 25-34 years LFS	35.6											i
	female 15-64 years LFS	31.3											i	
	male 15-64 years LFS	27.1												

Notes:

- a CS 2016 Provincial
- b Stats SA GHS 2018
- c Stats SA GHS 2018
- d Stats SA GHS 2018
- e Labour Force Survey Q1 2017
- f Labour Force Survey Q4 2017
- g Labour Force Survey Q4 2018
- h Labour Force Survey Q1 2019
- i Labour Force Survey Q2 2019

Mortality

Table 29: Mortality indicators for South Africa

Indicator	Period	Sex Age Series Cat	SA	Ref
Adult mortality (45q15 - probability of dying between 15-60 years of age)	2015	both sexes RMS	34.0	a
	2016	both sexes RMS	33.0	a
	2017	both sexes RMS	32.0	b
		female RMS	26.0	b
		male RMS	38.0	b
Life expectancy at birth	2017	both sexes mid-year	64.1	c
		both sexes RMS	64.2	b
		female RMS	67.6	b
		male RMS	61.2	b
	2018	both sexes mid-year	64.4	c
	2019	both sexes mid-year	64.7	c
		female mid-year	67.7	c
	male mid-year	61.5	c	
Infant mortality rate (deaths under 1 year per 1 000 live births)	2017	both sexes <1 year mid-year	24.30	c
		both sexes <1 year RMS	23.00	b
	2018	both sexes <1 year mid-year	22.40	c
	2019	both sexes <1 year mid-year	22.10	c
Under 5 mortality rate (deaths under 5 years per 1 000 live births)	2017	both sexes <5 years mid-year	29.10	c
		both sexes <5 years RMS	32.00	b
		both sexes <5 years WHO	37.00	d
		female <5 years WHO	33.00	d
		male <5 years WHO	41.00	d
	2018	both sexes <5 years mid-year	27.80	c
	2019	both sexes <5 years mid-year	28.50	c
Mortality between 30-70 years from cardiovascular, cancer, diabetes or chronic respiratory disease	2014	both sexes 30-70 years RMS	30.0	b
	2015	both sexes 30-70 years RMS	30.0	b
		both sexes 30-70 years WHO	26.2	d
	2016	female 30-70 years RMS	24.0	b
		female 30-70 years WHO	21.2	d
		male 30-70 years RMS	34.0	b
		male 30-70 years WHO	32.3	d
	Suicide mortality rate (per 100 000 population)	2014	both sexes vital registration	2.6
2015		both sexes vital registration	1.3	e
2016		both sexes WHO	11.6	d
		female WHO	4.7	d
		male WHO	18.7	d

Notes:

- a RMS 2016
- b RMS 2017
- c Stats SA MYE 2019
- d World Health Statistics 2019
- e SDG Baseline 2017

Table 30: Maternal and neonatal mortality indicators by province

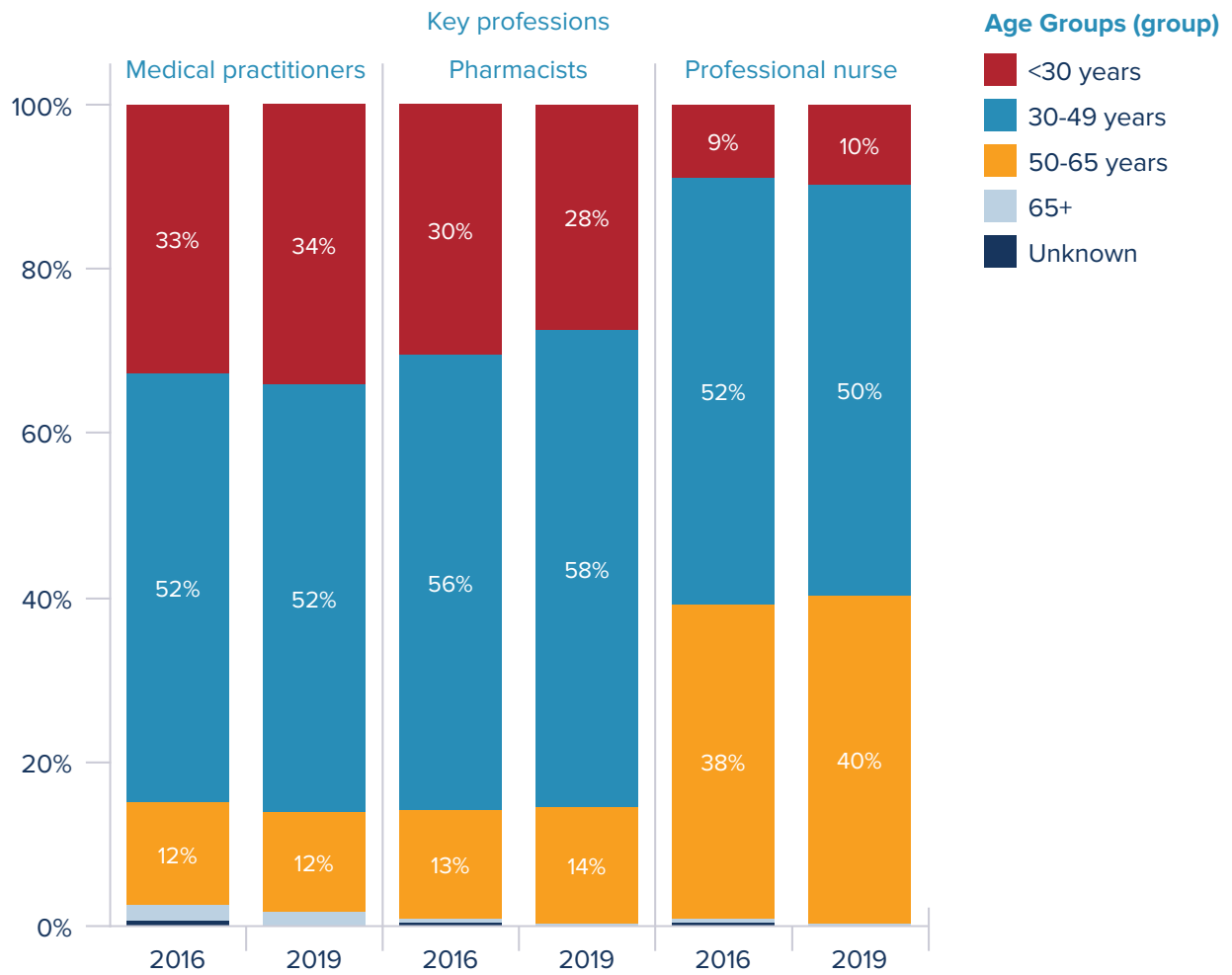
Indicator	Period	Sex Age Series Cat	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	Ref
Maternal death in facility	2018/19	DHIS	1 065	118	85	281	188	143	78	17	86	69	a
Maternal mortality in facility ratio	2016/17	female DHIS	111.5	127.6	148.4	114.7	100.2	125.9	123.0	87.5	130.1	57.70	a
	2017/18	female DHIS	105.7	128.3	132.9	108.5	101.9	109.2	120.0	65.9	117.5	55.10	a
	2018/19	female DHIS	105.9	106.1	168.3	122.8	88.4	111.6	92.4	71.3	137.4	66.80	a
Maternal mortality ratio (MMR)	2014	female RMS	164.0										b
	2015	female RMS	152.0										b
	2016	female RMS	134.0										c
Maternal mortality ratio in facility / institutional (iMMR)	2014	female NCCEMD	140.8										d
	2015	female NCCEMD	131.4										d
	2014-2016	female NCCEMD	134.3	148.5	174.6	128.6	127.1	168.7	134.4	132.3	172.2	68.30	d
	2016	female NCCEMD	135.2										d
Neonatal death in facility rate	2016/17	both sexes DHIS	12.4	13.2	14.3	13.6	12.4	12.2	10.9	15.8	12.1	8.50	a
	2017/18	both sexes DHIS	12.3	13.8	14.1	13.6	12.4	12.4	11.5	11.6	9.4	9.00	a
	2018/19	both sexes DHIS	12.1	12.5	16.8	13.0	11.5	13.2	11.5	11.7	10.6	8.90	a
Neonatal mortality rate (NMR) (deaths <28 days old per 1 000 live births)	2015	both sexes RMS	12.0										b
	2016	both sexes RMS	12.0										b
	2017	both sexes RMS	12.0										c
Perinatal mortality rate (stillbirths plus deaths <8 days old per 1 000 total births)	2014	both sexes P0309.4 registered	22.5										e
	2015	both sexes P0309.4 registered	23.1										e
	2016	both sexes P0309.4 registered	21.0										e
	2016/17	both sexes DHIS	23.0	18.1	29.6	23.2	21.1	27.3	24.9	35.4	24.6	21.00	a
	2017/18	both sexes DHIS	24.8	19.1	34.1	24.4	23.7	30.0	28.3	32.6	22.8	23.20	a
2018/19	both sexes DHIS	30.1	28.3	39.9	28.6	30.8	31.7	30.2	34.3	30.6	25.60	a	
Still birth in facility	2018/19	both sexes DHIS	20 033	1 942	1 291	4 292	4 543	2 566	1 663	549	1 314	1 873	a
Stillbirth in facility rate	2016/17	both sexes DHIS	20.2	18.6	26.9	19.0	21.2	19.6	20.9	22.4	23.6	17.30	a
	2017/18	both sexes DHIS	21.1	19.6	26.2	19.3	23.3	21.4	21.4	21.6	22.1	18.70	a
	2018/19	both sexes DHIS	20.4	18.2	26.7	19.0	22.0	20.3	20.2	24.6	21.9	18.50	a

Notes:

- a DHIS
- b RMS 2016
- c RMS 2017
- d Saving Mothers 2014-2016
- e Perinatal deaths 2016

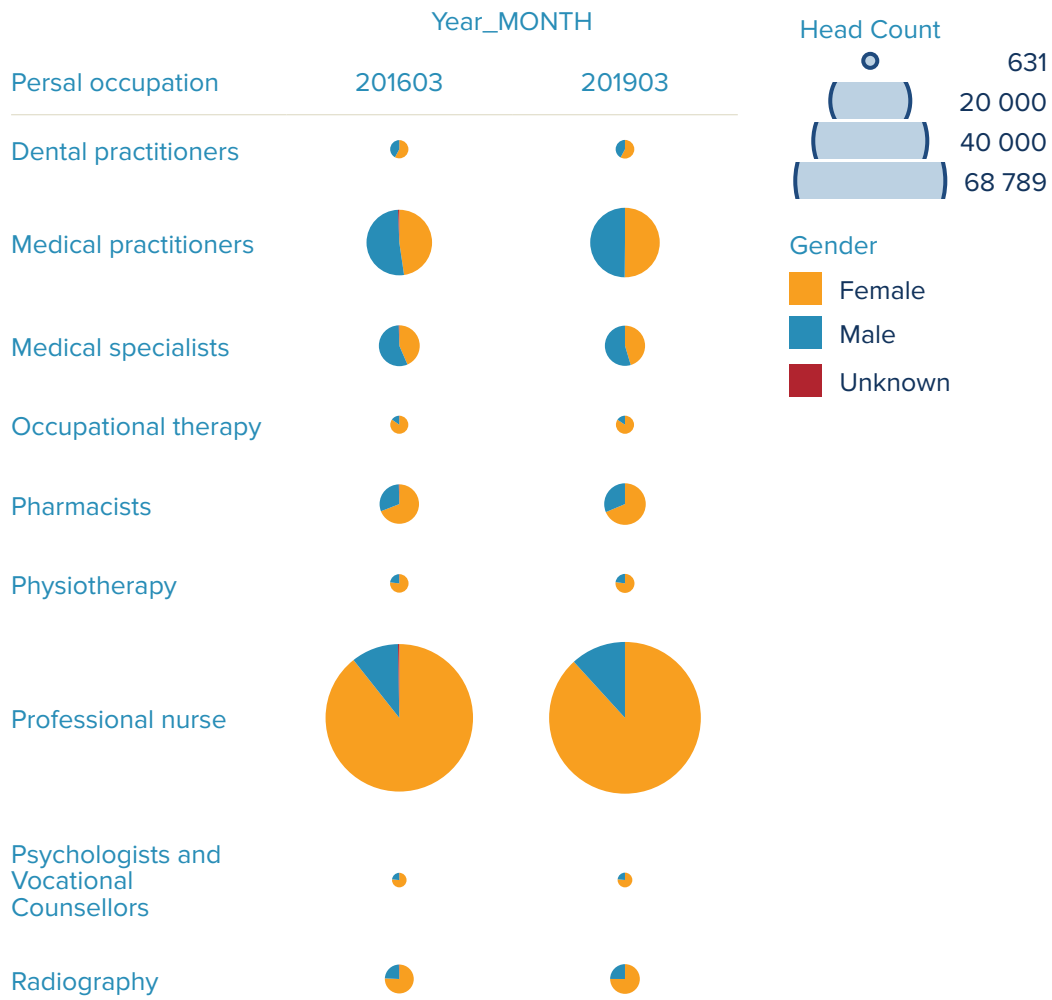
Health services indicators

Figure 26: Age breakdown of selected public sector health professionals, 2016 and 2019



Source: PERSAL.

Figure 27: Number of selected public sector health professionals by sex, 2016 and 2019



Source: PERSAL.

Table 31: Number of public sector health professionals, national, provincial and by district

	Geo area	Number of clinical associates		Number of dental practitioners		Number of dental specialists		Number of dental therapists		Number of enrolled nurses		Number of environmental health practitioners	
		2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
Country	ZA: South Africa	310	372	992	1 038	159	146	313	342	31 466	31 039	378	348
Province	EC: Eastern Cape	70	84	118	143			9	17	3 238	3 350	26	21
	FS: Free State	18	19	37	46	1	1	1		863	996	50	48
	GP: Gauteng	43	38	233	234	120	108	42	45	6 921	7 426	66	93
	KZ: KwaZulu-Natal	62	121	124	108	1		119	102	10 763	9 642	94	81
	LP: Limpopo	7	11	177	175	2	2	102	138	4 301	3 950	26	25
	MP: Mpumalanga	67	67	109	96	1	1	14	17	1 729	1 831	84	40
	NC: Northern Cape	2	2	27	25	1		8	8	206	237	13	12
	NW: North West	41	30	44	51			16	13	880	964	19	28
	WC: Western Cape			123	160	33	34	2	2	2 565	2 643		
District	BUF: Buffalo City MM	4	4	21	23			3	6	443	480	2	1
	CPT: Cape Town MM			63	87	22	21	2	2	1 761	1 781		
	DC1: West Coast DM			5	4					137	144		
	DC2: Cape Winelands DM			40	52	11	13			341	365		
	DC3: Overberg DM			3	4					72	74		
	DC4: Garden Route DM			10	11					224	246		
	DC5: Central Karoo DM			2	2					30	33		
	DC6: Namakwa DM			4	4			0		30	30	1	1
	DC7: Pixley Ka Seme DM	0	0	6	5			0		22	40	1	1
	DC8: ZF Mgcawu DM			5	4			3	3	54	59	3	3
	DC9: Frances Baard DM	0		10	12	1		5	5	76	85	5	4
	DC10: Sarah Baartman DM	4	9	17	16			1	1	173	196	4	4
	DC12: Amathole DM	13	18	21	20			2	3	370	392	4	3
	DC13: C Hani DM	13	18	14	15			0		401	433	1	1
	DC14: Joe Gqabi DM	10	10	4	7					175	168	2	2
	DC15: OR Tambo DM	15	13	16	17			1	4	936	916	6	4
	DC16: Xhariep DM	1	2	2	3					27	52	3	4
	DC18: Lejweleputswa DM	7	4	6	8					218	243	10	9
	DC19: T Mofutsanyana DM	1	1	14	12			1		138	165	15	14
	DC20: Fezile Dabi DM	7	8	4	5					144	146	7	7
	DC21: Ugu DM	6	14	12	11			14	13	694	578	7	5
	DC22: uMgungundlovu DM	4	16	23	20			21	16	1 359	1 160	12	8
	DC23: uThukela DM	7	10	6	6			3	2	538	504	5	4
	DC24: uMzinyathi DM	8	11	5	4			4	3	601	579	4	3
	DC25: Amajuba DM	6	15	7	7			7	6	480	449	3	3
	DC26: Zululand DM	7	14	5	6			5	4	784	717	7	6
	DC27: uMkhanyakude DM	4	9	3	3			11	9	872	800	9	10
	DC28: King Cetshwayo DM	6	5	10	9	0		4	4	1 209	1 092	10	8
	DC29: iLembe DM	4	11	8	8			8	8	535	495	4	3
	DC30: G Sibande DM	21	24	36	31			3	6	525	479	15	3

Table 31 (cont.)

Geo area	Number of clinical associates		Number of dental practitioners		Number of dental specialists		Number of dental therapists		Number of enrolled nurses		Number of environmental health practitioners	
	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
DC31: Nkangala DM	16	16	34	29			1	2	297	341	34	12
DC32: Ehlanzeni DM	30	27	39	36	1	1	10	9	907	1 011	35	25
DC33: Mopani DM	1	3	31	31	0		21	27	767	727	6	6
DC34: Vhembe DM	2	3	29	29	0		29	41	1 011	859	8	6
DC35: Capricorn DM	1	2	51	52	2	2	18	24	1 117	1 040	3	3
DC36: Waterberg DM	0		31	31	0		16	21	626	580	3	3
DC37: Bojanala Platinum DM	3	1	12	13			2	2	271	287	4	8
DC38: NM Molema DM	13	9	12	16			6	6	200	226	5	10
DC39: RS Mompoti DM	13	7	12	12			2	2	142	179	7	6
DC40: Dr K Kaunda DM	12	13	8	10			4	2	267	272	3	4
DC42: Sedibeng DM	9	7	16	16	2	2	4	6	473	491	7	5
DC43: Harry Gwala DM	3	5	3	2			8	6	396	383	8	7
DC44: A Nzo DM	11	12	5	10					265	284	1	1
DC45: JT Gaetsewe DM	2	2	2				0		24	23	1	1
DC47: Sekhukhune DM	3	3	35	32	0		18	25	780	744	1	1
DC48: West Rand DM	8	7	11	13			5	5	594	653	6	6
EKU: City of Ekurhuleni MM	5	4	23	24	1		10	11	1 313	1 346	14	14
ETH: eThekweni MM	7	11	42	32	1		34	31	3 295	2 885	25	21
JHB: Johannesburg MM	6	5	66	59	40	37	10	9	2 393	2 590	21	17
MAN: Mangaung MM	2	4	11	18	1	1	0		321	370	12	12
NMA: N Mandela Bay MM			19	34			2	3	475	481	4	3
TSH: Tshwane MM	15	15	116	121	77	69	13	14	2 146	2 344	3	4

Table 31 (cont.)

	Geo area	Number of medical practitioners		Number of medical researchers		Number of medical specialists		Number of nursing assistants		Number of occupational therapists		Number of pharmacists	
		2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
Country	ZA: South Africa	12 839	14 439	68	31	4 987	4 825	34 704	33 820	972	979	4 643	5 132
Province	EC: Eastern Cape	1 456	1 877		2	164	197	5 457	5 381	90	105	578	787
	FS: Free State	580	631	6	4	303	315	2 168	2 038	54	53	294	304
	GP: Gauteng	3 141	3 409	16	11	2 011	1 858	6 554	6 413	197	199	1 064	1 149
	KZ: KwaZulu-Natal	3 346	3 460	5	4	741	843	6 258	6 052	170	129	741	765
	LP: Limpopo	1 164	1 231	2	2	70	72	5 117	4 681	188	215	505	525
	MP: Mpumalanga	783	868			76	74	1 606	1 465	75	66	250	283
	NC: Northern Cape	357	353	1	2	26	24	878	856	35	33	109	134
	NW: North West	592	761			109	124	2 536	2 735	34	37	192	226
	WC: Western Cape	1 420	1 849	38	6	1 487	1 318	4 130	4 199	129	142	910	959
District	BUF: Buffalo City MM	357	460		1	61	59	789	786	14	17	114	136
	CPT: Cape Town MM	1 017	1 364	16	4	1 305	1 144	3 164	3 264	104	114	527	557
	DC1: West Coast DM	47	57	4		5	6	148	147	4	4	37	44
	DC2: Cape Winelands DM	166	202	5		85	86	404	376	11	11	96	100
	DC3: Overberg DM	35	41	3	2	6	4	86	79	2	3	41	39
	DC4: Garden Route DM	139	167	5		56	51	276	278	7	9	99	111
	DC5: Central Karoo DM	8	9	1				52	55	1	1	18	18
	DC6: Namakwa DM	20	17					91	84	3	4	9	11
	DC7: Pixley Ka Seme DM	18	17					153	147	4	3	10	19
	DC8: ZF Mgcawu DM	26	45			2	1	196	191	5	5	14	18
	DC9: Frances Baard DM	274	256	1	1	21	21	325	319	22	20	50	59
	DC10: Sarah Baartman DM	77	89			7	5	274	282	14	14	76	89
	DC12: Amathole DM	86	87			2	1	735	716	6	9	48	64
	DC13: C Hanu DM	120	139			4	1	672	707	8	9	43	60
	DC14: Joe Gqabi DM	41	59					290	292	5	4	16	23
	DC15: OR Tambo DM	321	462			35	52	1 429	1 346	10	16	92	206
	DC16: Xhariep DM	16	22	2	1			113	118	5	5	23	23
	DC18: Lejweleputswa DM	85	99			10	7	203	184	7	6	47	48
	DC19: T Mofutsanyana DM	113	139		1	10	17	445	384	7	6	67	66
	DC20: Fezile Dabi DM	85	94			11	4	287	266	5	4	55	48
	DC21: Ugu DM	216	206			24	26	461	425	9	4	71	65
	DC22: uMgungundlovu DM	652	612			178	202	788	734	45	36	92	101
	DC23: uThukela DM	131	143	1	1	19	18	295	280	7	5	28	29
	DC24: uMzinyathi DM	78	77	1	1	0	1	310	298	4	5	18	25
	DC25: Amajuba DM	187	230	1	1	11	12	407	377	8	8	34	40

Table 31 (cont.)

Geo area	Number of medical practitioners		Number of medical researchers		Number of medical specialists		Number of nursing assistants		Number of occupational therapists		Number of pharmacists	
	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
DC26: Zululand DM	92	100			1	2	375	387	3	3	28	33
DC27: uMkhanyakude DM	67	60			3	2	259	335	15	12	21	31
DC28: King Cetshwayo DM	288	316	1	1	37	37	459	485	6	4	48	55
DC29: iLembe DM	168	187			24	37	293	286	6	3	33	37
DC30: G Sibande DM	162	187			4	2	409	384	20	18	73	88
DC31: Nkangala DM	216	241			28	31	340	365	15	18	58	57
DC32: Ehlanzeni DM	400	436			44	40	857	716	40	30	119	138
DC33: Mopani DM	133	161			7	8	1 041	948	25	35	65	78
DC34: Vhembe DM	181	200			1	1	1 219	1 125	42	56	92	94
DC35: Capricorn DM	478	525	1	1	53	55	1 271	1 176	62	64	135	154
DC36: Waterberg DM	206	196			7	5	686	616	26	29	75	81
DC37: Bojanala Platinum DM	169	234			17	22	652	758	10	10	50	65
DC38: NM Molema DM	151	175			15	15	566	638	6	9	47	56
DC39: RS Mompoti DM	55	61			8	9	430	431	2	2	24	30
DC40: Dr K Kaunda DM	217	291			68	78	888	908	16	16	63	67
DC42: Sedibeng DM	149	163	1	1	28	34	348	339	10	8	127	129
DC43: Harry Gwala DM	69	60			1	1	324	305	6	6	23	26
DC44: A Nzo DM	51	76					575	580	3	2	18	25
DC45: JT Gaetsewe DM	16	15			1	1	113	115	1	1	7	7
DC47: Sekhukhune DM	165	149			2	3	900	816	32	31	116	94
DC48: West Rand DM	226	234			57	58	589	563	17	16	92	95
EKU: City of Ekurhuleni MM	648	804	1	1	97	106	1 095	1 104	37	37	212	253
ETH: eThekweni MM	1 396	1 469	1		440	503	2 287	2 140	61	43	341	321
JHB: Johannesburg MM	1 137	1 255	7	4	1 020	894	2 551	2 412	55	57	317	350
MAN: Mangaung MM	279	275	4	2	269	284	1 074	1 064	29	28	92	112
NMA: N Mandela Bay MM	403	505		1	54	79	693	672	30	34	165	179
TSH: Tshwane MM	940	927	5	3	792	757	1 969	1 995	75	78	311	317

Table 31 (cont.)

	Geo area	Clinical Associates per 100 000 population		Dental practitioners per 100 000 population		Dental specialists per 100 000 population		Dental therapists per 100 000 population		Enrolled nurses per 100 000 population		Environmental health practitioners per 100 000 population	
		2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
Country	ZA: South Africa	0.7	0.8	2.4	2.5	0.3	0.3	0.7	0.7	66.3	62.7	1.0	1.0
Province	EC: Eastern Cape	1.1	1.3	2.1	2.4			0.1	0.3	50.7	50.8	0.4	0.4
	FS: Free State	0.7	0.8	2.3	3.0	0.0	0.0	0.0		34.8	39.4	2.2	2.6
	GP: Gauteng	0.4	0.4	2.5	2.4	1.2	1.0	0.4	0.4	67.7	68.6	1.0	1.1
	KZ: KwaZulu-Natal	0.6	1.2	1.5	1.5	0.0		1.2	1.0	109.0	93.9	1.0	0.8
	LP: Limpopo	0.1	0.2	3.6	3.4	0.0	0.0	1.9	2.5	79.6	70.4	1.1	1.2
	MP: Mpumalanga	1.8	1.7	3.2	2.7	0.0	0.0	0.4	0.4	45.5	46.3	2.5	1.3
	NC: Northern Cape	0.2	0.2	4.3	3.8	0.1		0.8	0.8	20.3	22.9	2.1	2.5
	NW: North West	1.2	0.9	1.8	2.2			0.5	0.4	26.3	27.5	1.1	1.5
	WC: Western Cape			2.7	3.3	0.7	0.6	0.0	0.0	50.8	50.0		
District	BUF: Buffalo City MM	0.6	0.6	3.7	3.6			0.5	0.9	68.2	71.4	0.3	0.2
	CPT: Cape Town MM			2.2	2.9	0.7	0.6	0.1	0.1	56.2	54.6		
	DC1: West Coast DM			1.9	1.5					37.7	37.0		
	DC2: Cape Winelands DM			5.8	7.0	1.5	1.7			46.2	46.8		
	DC3: Overberg DM			1.7	2.0					30.5	29.6		
	DC4: Garden Route DM			2.3	2.4					43.8	46.3		
	DC5: Central Karoo DM			3.0	2.9					45.5	48.6		
	DC6: Namakwa DM			7.5	6.4			0.0		32.0	32.1	3.2	3.2
	DC7: Pixley Ka Seme DM	0.0	0.0	3.4	3.8			0.0		12.3	21.7	2.8	2.7
	DC8: ZF Mgcawu DM			4.6	2.2			1.4	1.3	25.0	26.3	1.8	3.1
	DC9: Frances Baard DM	0.0		5.6	5.9	0.3		1.6	1.6	23.8	26.4	1.9	2.2
	DC10: Sarah Baartman DM	0.9	1.9	4.5	3.7			0.2	0.2	37.3	40.4	1.1	1.0
	DC12: Amathole DM	1.4	1.9	2.6	2.5			0.2	0.3	39.4	40.9	0.4	0.4
	DC13: C Hani DM	1.7	2.3	2.2	2.3			0.0		52.2	55.4	0.1	0.1
	DC14: Joe Gqabi DM	2.9	2.8	1.7	2.2					50.3	46.9	0.6	0.6
	DC15: OR Tambo DM	1.1	0.9	1.2	1.5			0.1	0.3	66.7	63.2	0.4	0.3
	DC16: Xhariep DM	0.7	1.4	1.5	5.0					19.6	37.4	2.2	5.7
	DC18: Lejweleputswa DM	1.2	0.7	1.4	1.8					37.4	40.7	1.7	1.8
	DC19: T Mofutsanyana DM	0.1	0.1	3.4	2.9			0.1		19.4	22.8	2.1	3.0
	DC20: Fezile Dabi DM	1.6	1.8	1.8	2.5					33.3	33.1	1.6	1.8
	DC21: Ugu DM	0.8	1.9	2.2	2.2			2.0	1.8	97.3	78.1	1.0	0.7
	DC22: uMgungundlovu DM	0.4	1.5	2.8	2.4			2.1	1.5	135.5	110.1	1.2	0.8

Table 31 (cont.)

	Geo area	Clinical Associates per 100 000 population		Dental practitioners per 100 000 population		Dental specialists per 100 000 population		Dental therapists per 100 000 population		Enrolled nurses per 100 000 population		Environmental health practitioners per 100 000 population	
		2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
District	DC23: uThukela DM	1.0	1.4	1.0	1.4			0.4	0.3	77.6	70.1	0.7	0.6
	DC24: uMzinyathi DM	1.5	2.0	1.1	1.1			0.8	0.6	114.4	106.3	0.8	0.6
	DC25: Amajuba DM	1.2	2.8	1.6	1.5			1.4	1.1	93.1	82.6	0.6	0.6
	DC26: Zululand DM	0.9	1.7	0.7	1.4			0.6	0.5	96.8	84.6	0.9	0.7
	DC27: uMkhanyakude DM	0.6	1.3	0.8	1.3			1.7	1.3	135.1	119.5	1.7	2.2
	DC28: King Cetshwayo DM	0.7	0.5	1.5	1.6	0.0		0.5	0.4	135.6	118.6	1.1	0.9
	DC29: iLembe DM	0.6	1.7	1.6	2.0			1.3	1.2	85.7	75.6	0.6	0.5
	DC30: G Sibande DM	2.1	2.3	4.3	3.2			0.3	0.6	52.1	45.4	1.9	1.0
	DC31: Nkangala DM	1.3	1.2	2.7	2.3			0.1	0.2	23.7	25.6	2.7	0.9
	DC32: Ehlanzeni DM	2.0	1.7	2.9	2.6	0.1	0.1	0.7	0.6	59.0	64.6	2.7	1.9
	DC33: Mopani DM	0.1	0.3	3.1	2.8	0.0		1.9	2.3	68.8	63.0	1.3	1.3
	DC34: Vhembe DM	0.2	0.2	2.5	2.5	0.0		2.2	3.0	76.4	62.2	1.2	1.1
	DC35: Capricorn DM	0.1	0.2	4.5	4.5	0.2	0.2	1.5	1.9	92.5	84.0	0.7	0.7
	DC36: Waterberg DM	0.0		5.5	5.5	0.0		2.5	3.2	99.1	88.0	1.4	1.5
	DC37: Bojanala Platinum DM	0.2	0.1	1.1	1.5			0.1	0.1	19.0	19.0	0.8	1.1
	DC38: NM Molema DM	1.5	1.0	1.9	2.5			0.7	0.7	23.7	25.8	1.2	2.1
	DC39: RS Mompoti DM	3.0	1.6	3.4	3.8			0.5	0.5	32.3	40.1	2.5	2.2
	DC40: Dr K Kaunda DM	1.9	1.9	2.0	2.2			0.6	0.3	41.4	40.4	0.8	1.5
	DC42: Sedibeng DM	1.2	0.9	2.2	2.3	0.3	0.3	0.5	0.8	62.1	62.3	1.3	1.0
	DC43: Harry Gwala DM	0.6	1.0	1.1	1.0			1.7	1.2	84.0	78.0	1.7	1.4
	DC44: A Nzo DM	1.3	1.4	0.6	1.3					32.4	33.6	0.1	0.1
	DC45: JT Gaetsewe DM	1.0	0.9	1.5	0.9			0.0		11.7	10.8	0.5	0.9
	DC47: Sekhukhune DM	0.3	0.3	3.5	2.8	0.0		1.6	2.1	69.0	62.9	0.8	0.9
	DC48: West Rand DM	1.2	1.0	2.1	2.4			0.8	0.7	90.7	96.6	1.5	1.5
	EKU: City of Ekurhuleni MM	0.2	0.1	1.1	1.1	0.0		0.4	0.4	49.8	48.9	1.0	0.9
	ETH: eThekweni MM	0.2	0.4	1.5	1.2	0.0		1.1	1.0	110.5	93.3	0.8	0.7
	JHB: Johannesburg MM	0.2	0.1	1.8	1.5	1.0	0.9	0.3	0.2	61.9	62.6	0.7	0.5
	MAN: Mangaung MM	0.3	0.6	2.0	3.7	0.2	0.2	0.0		52.3	58.8	2.0	2.2
	NMA: N Mandela Bay MM			2.1	3.4			0.2	0.3	47.2	45.8	0.4	0.3
	TSH: Tshwane MM	0.7	0.6	5.2	5.2	3.3	2.8	0.6	0.6	93.2	95.1	0.2	0.2

Table 32: Public sector health professionals per 100 000 uninsured population, national, provincial and by district

	Geo area	Number of physiotherapists		Number of professional nurses		Number of psychologists		Number of radiographers		Number of speech therapists and audiologists		Number of student nurses	
		2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
Country	ZA: South Africa	1 020	1 077	64 975	68 776	631	646	2 496	2 632	494	487	6 887	3 761
Province	EC: Eastern Cape	107	129	9 857	10 698	66	66	320	361	37	40	11	
	FS: Free State	43	47	2 133	2 175	22	21	148	143	7	11		
	GP: Gauteng	173	179	12 303	13 693	174	192	618	637	123	123	4 062	2 255
	KZ: KwaZulu-Natal	265	256	16 070	16 719	91	70	542	568	116	100	1 541	612
	LP: Limpopo	167	170	9 515	9 188	114	120	179	186	79	73	445	294
	MP: Mpumalanga	57	67	5 010	5 389	34	36	96	114	45	38	789	577
	NC: Northern Cape	36	37	1 325	1 446	15	18	84	75	16	13		
	NW: North West	44	59	3 924	4 361	33	38	90	101	13	18	39	23
WC: Western Cape	128	133	4 838	5 107	82	85	419	447	58	71			
District	BUF: Buffalo City MM	22	23	1 602	1 647	4	6	79	81	8	11		
	CPT: Cape Town MM	97	99	3 341	3 524	68	72	332	354	43	51		
	DC1: West Coast DM	4	6	212	225	4	4	12	13	2	4		
	DC2: Cape Winelands DM	11	13	553	588	6	5	35	39	6	8		
	DC3: Overberg DM	3	3	149	163	2	2	10	11	2	3		
	DC4: Garden Route DM	12	11	451	477	2	2	25	24	2	2		
	DC5: Central Karoo DM	1	1	76	79			3	4	2	2		
	DC6: Namakwa DM	5	8	132	132	2	1	8	9	1	1		
	DC7: Pixley Ka Seme DM	7	3	180	202	2	1	11	7	2			
	DC8: ZF Mgcawu DM	8	8	234	236	2	3	17	14	3	5		
	DC9: Frances Baard DM	15	16	536	567	8	12	41	39	8	6		
	DC10: Sarah Baartman DM	14	14	678	768	19	17	16	20	6	2		
	DC12: Amathole DM	5	10	1 291	1 323	1	1	29	34	0	2		
	DC13: C Hani DM	15	15	1 328	1 470	2	3	26	32	2	3		
	DC14: Joe Gqabi DM	2	2	490	532			14	16	1			
	DC15: OR Tambo DM	15	19	1 769	2 112	4	3	41	57	9	10		
	DC16: Xhariep DM	1	1	84	90	1		3	5		1		
	DC18: Lejweleputswa DM	5	4	381	405	1		14	15	0	1		
	DC19: T Mofutsanyana DM	12	11	416	411	2	2	26	27	1	1		
	DC20: Fezile Dabi DM	1	4	255	260	0	1	17	15	0	1		
	DC21: Ugu DM	12	12	1 163	1 246	5	3	32	31	12	10	135	72
	DC22: uMgungundlovu DM	36	35	2 452	2 522	34	29	71	83	14	14	285	90

Table 32 (cont.)

Geo area	Number of physiotherapists		Number of professional nurses		Number of psychologists		Number of radiographers		Number of speech therapists and audiologists		Number of student nurses	
	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
DC23: uThukela DM	16	15	819	812	3	2	27	31	9	8		
DC24: uMzinyathi DM	3	7	847	927	1		15	15	7	4	120	59
DC25: Amajuba DM	18	15	849	850	4	4	29	32	7	3	158	45
DC26: Zululand DM	12	13	1 082	1 112	1		22	22	5	7	112	49
DC27: uMkhanyakude DM	14	12	864	938	3	2	21	27	12	9		5
DC28: King Cetshwayo DM	10	7	1 475	1 533	3	3	43	41	5	5	241	101
DC29: iLembe DM	17	13	744	829	2	1	24	27	5	4	1	
DC30: G Sibande DM	15	17	1 293	1 422	5	8	29	31	10	6	15	
DC31: Nkangala DM	17	20	1 209	1 288	11	11	28	35	14	11	17	
DC32: Ehlanzeni DM	25	30	2 500	2 627	18	17	39	48	21	21	757	
DC33: Mopani DM	26	27	1 865	1 758	22	22	29	27	14	12	89	142
DC34: Vhembe DM	34	40	2 818	2 635	15	15	27	33	21	16	1	61
DC35: Capricorn DM	55	46	2 235	2 150	38	41	60	66	21	20	202	88
DC36: Waterberg DM	26	28	1 135	1 127	17	22	27	28	10	12	59	
DC37: Bojanala Platinum DM	9	17	1 218	1 392	5	8	20	29	3	8	16	16
DC38: NM Molema DM	14	17	1 035	1 081	10	12	19	21	1	1	22	7
DC39: RS Mompoti DM	8	8	532	629	1	2	14	11	1	1		
DC40: Dr K Kaunda DM	12	17	1 055	1 183	17	16	35	39	8	8	1	
DC42: Sedibeng DM	5	4	879	946	4	5	33	35	5	7	40	7
DC43: Harry Gwala DM	6	9	656	694	1	2	16	15				
DC44: A Nzo DM	5	10	708	823			16	19	1	1		
DC45: JT Gaetsewe DM	1	2	202	255			7	6	2	1		
DC47: Sekhukhune DM	26	29	1 448	1 508	22	20	36	32	13	13	94	3
DC48: West Rand DM	8	9	1 089	1 188	23	24	33	30	5	5	75	9
EKU: City of Ekurhuleni MM	31	35	2 061	2 437	15	21	90	95	25	27	118	48
ETH: eThekweni MM	121	117	5 112	5 243	33	24	241	243	40	36	489	191
JHB: Johannesburg MM	68	65	4 295	4 551	64	63	255	273	54	55	1 146	631
MAN: Mangaung MM	24	27	979	987	15	16	87	80	6	7		
NMA: N Mandela Bay MM	29	36	1 807	1 849	35	36	99	102	10	11		
TSH: Tshwane MM	61	66	3 647	4 093	68	79	206	204	34	29	183	50

Table 32 (cont.)

	Geo area	Health worker density (index)		Medical practitioners per 100 000 population		Medical practitioners per 100 000 population (Hogan index)		Medical practitioners per 100 000 population (index)		Medical researchers per 100 000 population		Medical specialists per 100 000 population	
		2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
Country	ZA: South Africa	14.6	15.3	30.0	32.0	33.4	35.6	10.0	10.7	0.1	0.1	10.5	9.7
Province	EC: Eastern Cape	13.8	16.6	25.2	30.8	28.0	34.2	8.4	10.3		0.0	2.6	3.0
	FS: Free State	12.8	13.2	25.0	27.7	27.8	30.8	8.3	9.2	0.2	0.2	12.2	12.5
	GP: Gauteng	14.8	15.0	33.5	33.7	37.3	37.5	11.2	11.2	0.2	0.1	19.7	17.2
	KZ: KwaZulu-Natal	15.1	15.1	36.6	35.8	40.7	39.8	12.2	11.9	0.1	0.0	7.5	8.2
	LP: Limpopo	14.5	14.3	24.2	24.5	26.9	27.2	8.1	8.2	0.0	0.0	1.3	1.3
	MP: Mpumalanga	12.0	12.6	23.3	26.1	25.9	29.0	7.8	8.7			2.0	1.9
	NC: Northern Cape	18.7	19.2	45.6	42.2	50.6	46.9	15.2	14.1	0.1	0.2	2.6	2.3
	NW: North West	11.0	12.7	20.9	25.9	23.3	28.8	7.0	8.7			3.3	3.5
	WC: Western Cape	16.1	17.2	32.0	38.9	35.6	43.2	10.7	13.0	0.8	0.1	29.5	25.0
District	BUF: Buffalo City MM	26.0	29.3	58.2	70.8	64.7	78.7	19.4	23.6		0.2	9.4	8.8
	CPT: Cape Town MM	17.0	18.4	36.3	45.5	40.3	50.6	12.1	15.2	0.5	0.1	41.7	35.1
	DC1: West Coast DM	9.2	9.8	17.1	18.8	19.0	20.9	5.7	6.3	1.1		1.4	1.5
	DC2: Cape Winelands DM	12.6	13.0	26.4	30.0	29.4	33.3	8.8	10.0	0.7		11.5	11.0
	DC3: Overberg DM	11.4	11.4	17.4	19.2	19.3	21.3	5.8	6.4	1.3	0.8	2.5	1.6
	DC4: Garden Route DM	15.6	16.7	30.9	35.0	34.3	38.9	10.3	11.7	1.0		10.9	9.6
	DC5: Central Karoo DM	18.0	18.4	24.3	26.5	27.0	29.5	8.1	8.8	1.5			
	DC6: Namakwa DM	14.3	14.5	26.6	22.4	29.6	24.9	8.9	7.5				
	DC7: Pixley Ka Seme DM	9.9	11.5	11.2	10.9	12.4	12.1	3.7	3.6				
	DC8: ZF Mgcawu DM	11.5	13.0	19.4	26.3	21.6	29.2	6.5	8.8			0.9	0.5
	DC9: Frances Baard DM	30.0	30.3	110.1	97.6	100.0	100.0	36.7	32.5	0.3	0.3	6.6	6.5
	DC10: Sarah Baartman DM	15.6	17.1	20.3	21.4	22.5	23.8	6.8	7.1			1.5	1.0
	DC12: Amathole DM	8.5	9.6	10.7	10.8	11.9	12.0	3.6	3.6			0.2	0.1
	DC13: C Hani DM	11.4	13.5	18.2	21.0	20.2	23.3	6.1	7.0			0.5	0.1
	DC14: Joe Gqabi DM	9.2	12.0	14.4	19.8	16.0	22.0	4.8	6.6				
	DC15: OR Tambo DM	11.7	17.4	25.4	34.8	28.3	38.7	8.5	11.6			2.5	3.6
	DC16: Xhariep DM	10.1	12.9	12.4	23.0	13.7	25.6	4.1	7.7	1.5	0.7		
	DC18: Lejweleputswa DM	8.5	9.2	14.9	18.3	16.6	20.3	5.0	6.1			1.7	1.2
	DC19: T Mofutsanyana DM	9.2	9.7	18.4	22.4	20.5	24.9	6.1	7.5		0.1	1.4	2.3
	DC20: Fezile Dabi DM	10.8	11.0	20.6	23.4	22.8	26.0	6.8	7.8			2.5	0.9
	DC21: Ugu DM	16.1	15.5	33.4	30.4	37.1	33.8	11.1	10.1			3.4	3.5
	DC22: uMgungundlovu DM	22.1	21.7	67.8	60.2	75.4	66.9	22.6	20.1			17.8	19.2
	DC23: uThukela DM	9.4	9.5	21.2	22.0	23.6	24.4	7.1	7.3	0.1	0.1	2.7	2.5

Table 32 (cont.)

Geo area	Health worker density (index)		Medical practitioners per 100 000 population		Medical practitioners per 100 000 population (Hogan index)		Medical practitioners per 100 000 population (index)		Medical researchers per 100 000 population		Medical specialists per 100 000 population	
	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
DC24: uMzinyathi DM	10.1	11.0	17.1	17.3	19.0	19.2	5.7	5.8	0.2	0.2	0.0	0.2
DC25: Amajuba DM	15.4	16.4	38.8	44.7	43.1	49.7	12.9	14.9	0.2	0.2	2.1	2.2
DC26: Zululand DM	8.3	9.3	13.3	14.3	14.8	15.9	4.4	4.8			0.1	0.2
DC27: uMkhanyakude DM	8.9	9.1	15.3	11.9	17.0	13.3	5.1	4.0			0.5	0.3
DC28: King Cetshwayo DM	14.0	15.0	35.9	36.7	39.9	40.8	12.0	12.2	0.1	0.1	4.1	4.0
DC29: iLembe DM	11.9	12.9	29.8	30.9	33.1	34.3	9.9	10.3			3.8	5.7
DC30: G Sibande DM	11.5	12.4	18.2	22.3	20.2	24.7	6.1	7.4			0.4	0.2
DC31: Nkangala DM	8.9	9.0	19.7	21.6	21.9	24.0	6.6	7.2			2.2	2.3
DC32: Ehlanzeni DM	14.6	15.6	29.3	32.3	32.6	35.8	9.8	10.8			2.9	2.6
DC33: Mopani DM	10.3	11.2	14.0	17.2	15.5	19.1	4.7	5.7			0.6	0.7
DC34: Vhembe DM	11.8	11.8	15.3	16.7	17.1	18.6	5.1	5.6			0.1	0.1
DC35: Capricorn DM	18.9	19.5	42.7	44.1	47.5	49.0	14.2	14.7	0.1	0.1	4.4	4.4
DC36: Waterberg DM	18.8	17.4	37.8	32.9	42.0	36.6	12.6	11.0			1.1	0.8
DC37: Bojanala Platinum DM	7.5	8.9	14.5	18.2	16.2	20.2	4.8	6.1			1.2	1.5
DC38: NM Molema DM	11.0	12.1	19.4	22.5	21.6	25.0	6.5	7.5			1.8	1.7
DC39: RS Mompoti DM	10.0	11.9	14.1	16.4	15.7	18.2	4.7	5.5			1.8	2.0
DC40: Dr K Kaunda DM	17.9	20.9	41.7	54.2	46.4	60.2	13.9	18.1			10.5	11.6
DC42: Sedibeng DM	14.8	15.1	22.7	23.5	25.2	26.1	7.6	7.8	0.1	0.1	3.7	4.3
DC43: Harry Gwala DM	10.9	10.4	19.5	15.9	21.7	17.6	6.5	5.3			0.2	0.2
DC44: A Nzo DM	5.0	6.7	7.1	10.4	7.9	11.6	2.4	3.5				
DC45: JT Gaetsewe DM	7.4	7.7	9.7	9.4	10.8	10.5	3.2	3.1			0.5	0.5
DC47: Sekhukhune DM	12.0	10.8	16.9	15.2	18.8	16.9	5.6	5.1			0.2	0.3
DC48: West Rand DM	19.3	19.4	39.8	38.3	44.3	42.6	13.3	12.8			8.7	8.6
EKU: City of Ekurhuleni MM	11.1	12.2	27.0	31.1	30.0	34.5	9.0	10.4	0.0	0.0	3.7	3.9
ETH: eThekweni MM	18.7	18.0	48.7	48.7	54.1	54.2	16.2	16.2	0.0		14.8	16.3
JHB: Johannesburg MM	13.1	13.1	32.0	32.4	35.6	36.1	10.7	10.8	0.2	0.1	26.4	21.6
MAN: Mangaung MM	20.6	21.4	48.0	46.5	53.4	51.7	16.0	15.5	0.7	0.3	43.8	45.1
NMA: N Mandela Bay MM	20.8	21.7	43.0	49.4	47.7	54.9	14.3	16.5		0.1	5.4	7.5
TSH: Tshwane MM	19.5	18.6	43.8	39.9	48.6	44.4	14.6	13.3	0.2	0.1	34.4	30.7

Table 32 (cont.)

	Geo area	Nursing assistants per 100 000 population		Occupational therapists per 100 000 population		Pharmacists per 100 000 population		Pharmacists per 100 000 population (index)		Physiotherapists per 100 000 population		Professional nurses per 100 000 population	
		2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
Country	ZA: South Africa	73.1	68.3	2.7	2.6	10.9	11.6	21.8	23.1	2.9	3.0	143.9	144.8
Province	EC: Eastern Cape	85.4	81.6	2.1	2.3	9.8	13.0	19.5	25.9	2.3	2.6	162.0	170.9
	FS: Free State	87.4	80.6	2.9	3.2	13.4	13.8	26.9	27.7	2.5	3.1	92.8	89.7
	GP: Gauteng	64.1	59.2	2.7	2.7	11.5	11.4	22.9	22.8	2.6	2.6	127.4	131.6
	KZ: KwaZulu-Natal	63.4	58.9	2.2	1.8	8.3	8.6	16.7	17.2	3.3	3.2	169.6	168.5
	LP: Limpopo	94.7	83.5	4.0	4.1	10.6	10.8	21.2	21.6	3.5	3.4	179.0	165.2
	MP: Mpumalanga	42.3	37.0	2.7	2.4	8.0	8.1	16.0	16.2	2.4	2.7	138.0	142.1
	NC: Northern Cape	86.6	82.6	5.4	5.4	14.9	17.2	29.8	34.4	5.9	5.9	143.9	147.0
	NW: North West	75.7	78.1	1.6	1.9	7.4	8.7	14.8	17.3	1.9	2.9	128.8	136.0
WC: Western Cape	81.8	79.5	2.9	2.9	18.8	18.9	37.6	37.8	3.1	3.0	103.6	103.2	
District	BUF: Buffalo City MM	121.5	116.9	2.8	3.1	17.9	21.0	35.7	41.9	4.3	4.0	252.7	254.2
	CPT: Cape Town MM	101.0	100.0	3.6	3.8	17.6	17.8	35.2	35.7	3.7	3.6	115.5	115.7
	DC1: West Coast DM	40.8	37.8	1.7	1.5	11.0	12.1	22.0	24.2	1.9	2.3	62.8	62.2
	DC2: Cape Winelands DM	54.8	48.2	1.9	1.7	14.0	13.7	27.9	27.4	2.0	1.9	81.2	79.4
	DC3: Overberg DM	36.5	31.6	0.9	1.2	18.2	16.4	36.5	32.8	1.3	1.2	70.0	71.6
	DC4: Garden Route DM	53.9	52.3	1.4	1.7	19.7	21.3	39.5	42.5	2.5	2.3	93.4	94.3
	DC5: Central Karoo DM	78.9	81.0	1.5	1.5	28.8	28.0	57.6	56.0	1.5	1.5	124.4	125.2
	DC6: Namakwa DM	97.0	89.8	6.4	7.5	9.6	12.8	19.2	25.6	7.5	11.8	172.6	158.2
	DC7: Pixley Ka Seme DM	85.7	79.8	3.4	3.3	11.8	17.9	23.5	35.8	4.5	3.3	110.9	116.2
	DC8: ZF Mgcawu DM	90.6	85.1	4.2	4.0	9.7	11.1	19.4	22.3	6.0	5.8	120.2	111.8
	DC9: Frances Baard DM	101.6	99.2	10.3	9.3	20.3	23.6	40.6	47.2	8.8	8.1	180.4	181.8
	DC10: Sarah Baartman DM	59.0	58.1	4.5	4.5	17.7	20.6	35.3	41.2	5.0	3.5	158.2	168.4
	DC12: Amathole DM	78.2	74.6	1.1	1.8	6.0	8.3	11.9	16.7	1.1	1.9	145.6	147.6
	DC13: C Hani DM	87.5	90.4	1.6	2.2	6.5	9.0	13.0	17.9	2.5	2.2	185.5	198.3
	DC14: Joe Gqabi DM	83.4	81.5	2.0	2.2	5.5	8.1	10.9	16.2	0.9	1.4	150.4	162.2
	DC15: OR Tambo DM	101.8	92.9	1.2	1.5	7.1	14.8	14.1	29.7	1.3	2.1	132.8	153.5
	DC16: Xhariep DM	82.2	84.8	3.6	5.0	19.6	20.1	39.3	40.2	2.2	4.3	64.0	69.0
	DC18: Lejweleputswa DM	34.8	30.9	1.7	2.0	9.1	8.9	18.2	17.8	1.0	1.3	68.6	70.8
	DC19: T Mofutsanyana DM	62.6	53.1	1.4	1.7	10.5	10.2	21.1	20.5	2.2	2.3	61.0	60.2
	DC20: Fezile Dabi DM	66.3	60.4	2.1	2.3	15.0	13.8	30.0	27.7	0.5	1.6	61.0	62.0
	DC21: Ugu DM	64.6	57.4	2.2	1.4	11.1	10.7	22.1	21.4	3.1	3.0	171.1	172.1
	DC22: uMgungundlovu DM	78.6	69.6	5.5	3.9	9.5	10.3	18.9	20.7	4.4	4.3	252.0	246.1
	DC23: uThukela DM	42.6	39.0	1.4	1.3	4.8	4.9	9.5	9.7	3.2	3.2	125.2	119.0
	DC24: uMzinyathi DM	59.0	54.7	1.5	1.5	5.3	6.6	10.7	13.2	1.3	2.0	169.9	176.3
	DC25: Amajuba DM	78.9	69.4	2.1	2.4	8.1	9.0	16.3	18.0	4.1	3.7	173.1	163.5

Table 32 (cont.)

Geo area	Nursing assistants per 100 000 population		Occupational therapists per 100 000 population		Pharmacists per 100 000 population		Pharmacists per 100 000 population (index)		Physiotherapists per 100 000 population		Professional nurses per 100 000 population	
	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
DC26: Zululand DM	46.3	45.7	0.6	0.9	4.7	6.3	9.4	12.5	2.0	2.2	138.2	135.1
DC27: uMkhanyakude DM	40.1	50.0	3.4	2.7	4.8	6.6	9.6	13.1	3.6	2.5	143.2	145.3
DC28: King Cetshwayo DM	51.5	52.7	1.0	1.2	6.6	7.8	13.2	15.6	1.8	1.4	174.0	175.0
DC29: iLembe DM	46.9	43.7	1.6	1.4	6.7	7.8	13.5	15.6	3.8	3.2	126.4	133.1
DC30: G Sibande DM	40.6	36.4	2.6	2.4	9.3	9.0	18.7	18.0	2.5	2.5	136.1	141.5
DC31: Nkangala DM	27.1	27.4	1.8	1.7	5.3	5.0	10.7	10.1	1.9	2.5	100.1	101.4
DC32: Ehlanzeni DM	55.7	45.7	3.6	2.9	9.3	10.2	18.6	20.3	2.7	3.0	169.7	174.0
DC33: Mopani DM	93.3	82.1	2.5	3.5	6.8	8.0	13.6	15.9	2.8	2.9	170.4	154.0
DC34: Vhembe DM	92.2	81.5	3.5	4.4	7.4	7.6	14.8	15.2	2.8	3.1	215.0	192.1
DC35: Capricorn DM	105.2	95.0	5.8	5.3	12.7	14.5	25.5	28.9	5.1	3.9	187.2	173.7
DC36: Waterberg DM	108.6	93.4	5.4	4.5	14.4	13.9	28.8	27.9	4.7	4.7	184.1	172.1
DC37: Bojanala Platinum DM	45.8	50.3	1.3	1.2	4.7	5.8	9.4	11.5	1.5	2.1	94.2	99.7
DC38: NM Molema DM	67.0	72.9	1.1	1.6	7.6	8.9	15.2	17.8	1.8	3.0	134.7	131.5
DC39: RS Mompoti DM	97.7	96.7	0.7	1.8	7.5	9.4	15.0	18.8	2.0	3.6	141.3	164.6
DC40: Dr K Kaunda DM	137.7	134.8	3.6	4.0	11.8	13.1	23.6	26.1	2.9	4.0	175.7	193.2
DC42: Sedibeng DM	45.7	43.0	2.1	2.8	18.0	17.8	36.0	35.5	1.4	1.9	117.9	123.5
DC43: Harry Gwala DM	68.7	62.1	1.7	2.0	6.6	6.9	13.2	13.8	1.9	2.4	149.6	153.8
DC44: A Nzo DM	70.3	68.6	0.4	0.5	2.8	4.1	5.6	8.3	0.6	1.5	91.8	104.4
DC45: JT Gaetsewe DM	55.1	54.2	0.5	1.9	5.8	5.7	11.7	11.3	1.9	2.4	107.7	127.7
DC47: Sekhukhune DM	79.6	69.0	3.3	2.8	11.6	9.6	23.2	19.1	2.7	2.8	131.6	130.6
DC48: West Rand DM	89.9	83.3	3.5	3.1	15.7	15.5	31.4	31.1	2.6	2.7	171.1	183.7
EKU: City of Ekurhuleni MM	41.5	40.1	2.1	2.1	9.0	9.6	18.0	19.1	2.0	2.1	84.4	92.4
ETH: eThekweni MM	76.7	69.2	2.2	1.6	11.4	10.4	22.9	20.8	4.2	4.1	175.9	173.7
JHB: Johannesburg MM	66.0	58.3	2.3	2.2	9.1	9.0	18.2	18.0	2.6	2.3	116.0	114.9
MAN: Mangaung MM	174.8	169.0	5.7	5.6	16.4	19.7	32.9	39.4	5.5	6.2	166.2	161.2
NMA: N Mandela Bay MM	68.9	63.9	4.4	3.6	17.1	17.1	34.2	34.2	4.2	4.1	184.4	182.4
TSH: Tshwane MM	85.6	81.0	4.1	3.9	14.7	14.0	29.5	28.1	3.6	3.6	172.4	172.3

Table 32 (cont.)

	Geo area	Professional nurses per 100 000 population (index)		Psychologists per 100 000 population		Radiographers per 100 000 population		Student nurses per 100 000 population	
		2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
Country	ZA: South Africa	14.4	14.5	1.6	1.4	6.1	5.8	14.5	7.6
Province	EC: Eastern Cape	16.2	17.1	1.1	1.1	5.7	5.9	0.2	
	FS: Free State	9.3	9.0	1.0	1.0	6.8	6.1		
	GP: Gauteng	12.7	13.2	2.1	2.1	7.0	6.6	39.7	20.8
	KZ: KwaZulu-Natal	17.0	16.9	1.1	0.8	6.2	6.0	15.6	6.0
	LP: Limpopo	17.9	16.5	2.2	2.2	4.0	3.5	8.2	5.2
	MP: Mpumalanga	13.8	14.2	1.1	1.0	3.3	3.6	20.8	14.6
	NC: Northern Cape	14.4	14.7	2.0	2.0	10.0	8.6		
	NW: North West	12.9	13.6	1.4	1.2	3.6	3.3	1.2	0.7
	WC: Western Cape	10.4	10.3	1.8	1.7	9.1	9.0		
District	BUF: Buffalo City MM	25.3	25.4	0.8	0.9	13.1	12.9		
	CPT: Cape Town MM	11.6	11.6	2.5	2.4	11.6	11.6		
	DC1: West Coast DM	6.3	6.2	1.1	1.0	3.9	3.6		
	DC2: Cape Winelands DM	8.1	7.9	0.8	0.6	5.2	5.5		
	DC3: Overberg DM	7.0	7.2	0.9	0.8	4.2	4.4		
	DC4: Garden Route DM	9.3	9.4	0.4	0.4	5.3	4.7		
	DC5: Central Karoo DM	12.4	12.5			6.1	5.9		
	DC6: Namakwa DM	17.3	15.8	2.1	1.1	9.6	10.7		
	DC7: Pixley Ka Seme DM	11.1	11.6	1.7	1.1	6.2	6.5		
	DC8: ZF Mgcawu DM	12.0	11.2	1.8	1.3	9.7	6.7		
	DC9: Frances Baard DM	18.0	18.2	3.1	4.4	16.3	14.0		
	DC10: Sarah Baartman DM	15.8	16.8	4.3	3.5	4.5	4.5		
	DC12: Amathole DM	14.6	14.8	0.1	0.2	4.0	3.8		
	DC13: C Hani DM	18.5	19.8	0.3	0.5	3.8	4.5		
	DC14: Joe Gqabi DM	15.0	16.2			4.6	5.9		
	DC15: OR Tambo DM	13.3	15.3	0.3	0.3	3.4	4.2		
	DC16: Xhariep DM	6.4	6.9	0.7		3.6	3.6		
	DC18: Lejweleputswa DM	6.9	7.1	0.3		2.9	2.9		
	DC19: T Mofutsanyana DM	6.1	6.0	0.4	0.3	4.6	4.4		
	DC20: Fezile Dabi DM	6.1	6.2	0.0	0.7	4.4	4.1		
	DC21: Ugu DM	17.1	17.2	0.8	0.7	5.2	4.7	18.9	9.7
	DC22: uMgungundlovu DM	25.2	24.6	3.7	3.0	8.3	8.0	28.4	8.5
	DC23: uThukela DM	12.5	11.9	0.4	0.3	4.3	4.3		
	DC24: uMzinyathi DM	17.0	17.6	0.4	0.2	3.6	3.3	22.8	10.8
	DC25: Amajuba DM	17.3	16.4	0.8	0.9	6.2	6.3	30.6	8.3

Table 32 (cont.)

	Geo area	Professional nurses per 100 000 population (index)		Psychologists per 100 000 population		Radiographers per 100 000 population		Student nurses per 100 000 population	
		2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar	2016 Mar	2019 Mar
District	DC26: Zululand DM	13.8	13.5	0.3	0.0	3.2	3.1	13.8	5.8
	DC27: uMkhanyakude DM	14.3	14.5	0.6	0.3	3.6	4.3		0.8
	DC28: King Cetshwayo DM	17.4	17.5	0.5	0.3	5.8	5.0	27.0	11.0
	DC29: iLembe DM	12.6	13.3	0.5	0.2	4.8	5.0	0.2	
	DC30: G Sibande DM	13.6	14.1	0.7	0.8	3.6	3.8	1.5	
	DC31: Nkangala DM	10.0	10.1	1.0	1.0	3.0	3.2	1.4	
	DC32: Ehlanzeni DM	17.0	17.4	1.5	1.1	3.3	3.7	49.2	
	DC33: Mopani DM	17.0	15.4	2.2	2.1	3.2	2.4	8.0	12.3
	DC34: Vhembe DM	21.5	19.2	1.1	1.1	2.6	2.5	0.1	4.4
	DC35: Capricorn DM	18.7	17.4	3.3	3.4	5.7	5.5	16.7	7.1
	DC36: Waterberg DM	18.4	17.2	2.8	3.5	5.5	4.9	9.3	
	DC37: Bojanala Platinum DM	9.4	10.0	0.8	0.6	2.5	2.3	1.1	1.1
	DC38: NM Molema DM	13.5	13.1	1.3	1.5	2.4	2.4	2.6	0.8
	DC39: RS Mompoti DM	14.1	16.5	0.2	0.5	4.8	2.9		
	DC40: Dr K Kaunda DM	17.6	19.3	3.6	2.7	6.7	7.1	0.2	
	DC42: Sedibeng DM	11.8	12.4	0.7	0.6	5.3	4.8	5.3	0.9
	DC43: Harry Gwala DM	15.0	15.4	0.2	0.6	3.8	3.3		
	DC44: A Nzo DM	9.2	10.4			2.3	2.2		
	DC45: JT Gaetsewe DM	10.8	12.8			3.9	3.3		
	DC47: Sekhukhune DM	13.2	13.1	2.0	1.7	3.6	3.0	8.3	0.3
	DC48: West Rand DM	17.1	18.4	4.6	4.1	5.8	5.0	11.4	1.3
	EKU: City of Ekurhuleni MM	8.4	9.2	0.9	0.8	4.3	4.0	4.5	1.7
	ETH: eThekweni MM	17.6	17.4	1.3	0.8	8.9	8.4	16.4	6.2
	JHB: Johannesburg MM	11.6	11.5	2.0	2.0	7.3	6.9	29.7	15.3
	MAN: Mangaung MM	16.6	16.1	2.6	2.5	15.1	13.0		
	NMA: N Mandela Bay MM	18.4	18.2	4.0	3.5	10.4	10.3		
	TSH: Tshwane MM	17.2	17.2	3.5	3.5	10.3	9.9	8.0	2.0

Table 33: Health services indicators by province

Indicator	Period	Sex/Agel Series/Cat	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	Ref
Average length of stay - total	2018/19	DHIS	6,0	6,8	5,6	6,0	6,8	5,4	4,9	5,0	6,9	5,5	a
Birth registration coverage	2016	both sexes Live births of current reg	83,6	85,8	92,9	87,6	71,7	84,5	81,1	91,1	89,0	86,8	b
		both sexes Live births of total reg	75,6										
Death registration coverage	2016	both sexes 15+ years vital registration	96,0										c
Healthcare Access and Quality (HAQ) Index	2016	GBD 2016	49,7										d
Hospital beds per 10 000 target population	Mar 2019	DHIS public sector	17,9	20,6	19,8	17,1	20,9	14,2	12,4	17,7	13,8	20,0	a
Inpatient bed utilisation rate - total	2018/19	DHIS	71,2	58,6	50,2	57,9	74,2	67,4	67,4	62,9	46,6	64,8	a
Inpatient crude death rate	2018/19	both sexes DHIS	4,6	5,8	4,3	4,5	4,7	4,8	5,0	5,2	5,9	2,9	a
Inpatient deaths - total	2018/19	both sexes DHIS	181 080	28 359	13 225	39 496	36 115	18 815	12 197	4 410	10 377	18 086	a
Number of beds	Mar 2019	DHIS Central Hospital	10 510	576	636	6 093	846					2 359	a
		DHIS District Hospital	30 351	6 080	1 694	2 652	8 083	4 238	2 633	605	396	2 970	a
		DHIS Provincial Hospital	10 218	1 759	588	2 161	1 748	1 013	774	674	1 229	272	a
		DHIS public sector	86 516	13 477	4 862	17 776	21 345	7 843	4 745	1 776	4 661	10 031	a
		DHIS Regional Hospital	19 875	2 082	1 184	4 763	6 942	1 543	877	227	830	1 427	a
		DHIS Specialised Psychiatric Hospita	10 006	1 316	760	1 524	2 414	987			1 206	1 799	a
		DHIS Specialised TB	3 615	1 437			629	62	461				1 026
Number of health facilities	Mar 2019	DHIS Central/ Tertiary Hospital	27	4	2	7	4	2	2	1	2	3	a
		DHIS CHC/ CDC	347	41	10	39	22	26	56	33	47	73	a
		DHIS Clinic	3 140	728	212	328	597	454	238	127	264	192	a
		DHIS District Hospital	251	65	25	12	39	30	23	11	13	33	a
		DHIS Other Hospitals	470	40	30	167	92	18	25	8	18	72	a
		DHIS Regional Hospita	48	5	4	9	13	5	3	1	3	5	a
OHH headcount 5 years and older coverage	2018/19	DHIS	30,3	32,4	42,3	20,4	55,8	31,5	11,1	54,7	43,6	0,0	a

Table 33 (cont.)

Indicator	Period	Sex/Agel Series/Cat	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	Ref
OHH headcount under 5 years coverage	2018/19	DHIS	83,6	65,3	65,5	59,2	145,0	72,3	46,0	124,0	171,4	0,0	a
OPD new client not referred rate	2018/19	DHIS	47,0	44,2	47,2	24,3	23,3	0,0	0,0	15,4	0,0	0,0	a
Patient Day Equivalent	2018	DHIS	32 512 977	4 387 716	2 126 047	7 467 109	7 143 300	3 009 770	1 897 671	573 412	1 610 459	4 297 493	a
Percentage Ideal clinics	2018/19	IC status	55,3	32,3	75,7	89,4	76,2	34,3	46,2	57,1	45,8	68,3	e
Percentage of fixed PHC facilities with 90% of tracer medicines available	2018/19	IC	84,7	79,6	97,7	97,6	96,5	67,8	88,2	83,8	66,6	92,1	e
PHC doctor clinical work load	2018/19	DHIS	20,7	21,3	19,2	23,4	15,9	17,0	19,7	15,9	11,4	26,8	a
PHC heacount total	2018	both sexes all ages DHIS	119 347 026	16 605 569	5 299 266	21 079 658	28 525 363	14 336 230	9 253 361	2 718 912	7 445 963	14 082 704	a
PHC headcount 5 years and older	2018/19	both sexes DHIS	99 082 287	14 060 982	4 465 459	17 363 822	23 833 478	11 409 321	7 512 561	2 268 354	6 155 833	12 012 477	a
PHC headcount under 5 years	2018/19	both sexes DHIS	20 264 739	2 544 587	833 807	3 715 836	4 691 885	2 926 909	1 740 800	450 558	1 290 130	2 070 227	a
PHC professional nurse clinical work load	2018/19	DHIS	26,3	29,8	26,8	25,5	31,9	21,0	32,1	20,6	19,9	23,0	a
PHC utilisation rate	2018/19	DHIS	2,1	2,3	1,8	1,5	2,5	2,4	2,1	2,2	1,9	2,2	a
PHC utilisation rate under 5 years	2018/19	DHIS	3,5	3,1	3,1	2,9	3,5	4,4	3,9	4,3	3,3	3,8	a
Proportion of health facilities with essential medicines	2018/19	DHIS	62,6	73,7	1,0	81,8	79,7	34,5	55,0	70,3	55,0	90,3	a
Tracer items stock-out rate (fixed clinic/CHC/ CDC)	2018/19	DHIS	37,4	26,3	112,8	18,2	20,3	65,5	45,0	29,7	45,0	9,7	a

Notes:

- a DHIS
- b Stats SA Live Births 2016
- c Stats SA Causes of death 2016
- d GBD 2016 HAQ
- e Ideal Clinic System

Table 34: Financial indicators by province

Indicator	Period	Sex/Age/ Series/Cat	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC	Ref
Expenditure per patient day equivalent (district hospitals)	2016/17	BAS real 2018/19 prices	2 808	2 624	2 769	3 166	2 801	3 266	2 548	2 743	2 775	2 516	a
	2017/18	BAS real 2018/19 prices	2 926	2 724	2 763	3 408	3 032	3 165	2 577	2 748	3 648	2 558	a
	2018/19	BAS real 2018/19 prices	2 939	3 056	2 666	3 465	2 992	3 061	2 657	2 864	3 315	2 502	a
Medical scheme beneficiaries	2016	both sexes all ages med schemes	8 878 081	638 434	387 739	3 479 810	1 253 144	412 936	545 595	179 595	461 237	1 309 134b	b
	2017	both sexes all ages med schemes	8 872 036	625 276	381 721	3 530 204	1 232 181	410 439	551 688	181 511	457 333	1 307 019	c
Medical scheme coverage	2016	both sexes all ages GHS	17,4	9,6	16,7	27,6	11,9	9,0	14,3	15,4	15,4	24,7	d
		both sexes all ages med schemes	15,7	9,8	13,5	24,4	11,3	7,1	12,3	14,8	12,0	20,1	b
		female 15+ years SADHS	15,5	12,8	12,6	17,4	12,8	10,5	9,3	12,5	12,5	30,1	e
		male 15+ years SADHS	16,6	11,9	12,1	17,4	11,3	13,4	11,2	12,5	15,7	36,3	e
	2017	both sexes 15+ years NiDS	15,4	10,3	16,0	20,5	9,7	12,4	14,2	17,6	19,3	17,9	f
		both sexes all ages GHS	16,9	9,9	14,9	25,0	12,6	8,3	13,9	16,3	15,5	24,8	g
		both sexes all ages med schemes	15,1	9,3	13,2	23,3	10,9	6,9	12,0	4,5	36,2	19,1	c
		both sexes all ages NiDS	14,1	9,0	14,7	19,7	8,5	10,8	13,6	15,8	17,1	17,4	f
2018	both sexes all ages GHS	16,4	10,0	16,2	23,9	12,4	8,2	12,6	16,1	13,5	25,1	i	
Medical scheme coverage (ave)	2018	both sexes GHS mode	15,4	9,8	13,5	24,6	11,2	7,2	12,5	15,1	11,9	20,1	j
Provincial & LG District Health Services expenditure per capita (uninsured)	2016/17	BAS real 2018/19 prices	1 836	1 803	1 741	1 741	1 985	2 232	1 891	2 092	1 647	1 888	a
	2017/18	BAS real 2018/19 prices	1 886	1 842	1 729	1 609	2 020	2 301	1 969	2 065	1 639	1 939	a
	2018/19	BAS real 2018/19 prices	1 942	1 972	1 760	1 620	2 078	2 344	2 078	2 155	1 729	1 957	a
Provincial & LG PHC expenditure per capita (uninsured)	2016/17	BAS real 2018/19 prices	1 121	970	1 094	1 184	1 281	928	954	1 280	1 130	1 180	a
	2017/18	BAS real 2018/19 prices	1 164	1 003	1 103	1 254	1 298	998	1 045	1 316	1 150	1 200	a
	2018/19	BAS real 2018/19 prices	1 206	1 032	1 131	1 269	1 367	1 065	1 125	1 383	1 190	1 205	a
Provincial & LG PHC expenditure per PHC headcount	2016/17	BAS real 2018/19 prices	425	343	440	549	433	329	383	434	474	413	a
	2017/18	BAS real 2018/19 prices	470	395	504	619	457	368	439	500	526	435	a
	2018/19	BAS real 2018/19 prices	495	406	536	639	486	412	474	524	552	445	a

Notes:

- a DHB 2018/19
- b Medical Schemes 2016-17
- c Medical Schemes 2017-18
- d Stats SA GHS 2016
- e SADHS 2016 Full Report

- f NiDS Wave 5 v1.0
- g Stats SA GHS 2017
- h NiDS Wave 5 v1.0
- i Stats SA GHS 2018
- j Insight med schemes 2019

Table 35: Medical schemes coverage estimates by source, national, provincial and district

Geographic area		Medical scheme coverage										Stats SA GHS 2018	DHB 2015/16	Insight med schemes 2019
		NiDS Wave 1 v7.0		NiDS Wave 2 v4.0		NiDS Wave 3 v3.0		NiDS Wave 4 v2.0		NiDS Wave 5 v1.0				
		15+ years 2008	all ages 2008	15+ years 2010-2011	all ages 2010-2011	15+ years 2012	all ages 2012	15+ years 2014-2015	all ages 2014-2015	15+ years 2017	all ages 2017			
Country	ZA: South Africa	15,9	14,3	16,0	14,2	15,4	13,9	15,9	14,5	15,4	14,1	16,4	17,5	15,4
	Province	EC: Eastern Cape	10,4	8,8	12,1	10,1	8,9	7,3	10,0	8,7	10,3	9,0	10,0	10,7
	FS: Free State	16,5	16,2	19,1	18,0	15,4	16,4	16,8	16,5	16,0	14,7	16,2	16,2	13,5
	GP: Gauteng	22,4	21,2	23,7	21,8	21,6	20,9	21,3	20,3	20,5	19,7	23,9	27,7	24,6
	KZ: KwaZulu-Natal	8,6	7,2	11,2	9,0	11,2	9,1	11,9	10,0	9,7	8,5	12,4	11,9	11,2
	LP: Limpopo	8,9	7,6	6,9	7,2	10,0	8,1	12,7	12,0	12,4	10,8	8,2	8,5	7,2
	MP: Mpumalanga	16,2	14,7	15,9	14,5	14,6	13,0	12,7	11,4	14,2	13,6	12,6	15,5	12,5
	NC: Northern Cape	15,5	15,8	13,8	14,0	19,5	18,8	15,5	13,6	17,6	15,8	16,1	17,6	15,1
	NW: North West	20,9	19,3	11,9	10,4	17,2	14,4	18,0	16,2	19,3	17,1	13,5	15,0	11,9
	WC: Western Cape	23,1	22,2	21,1	19,8	18,7	19,0	20,7	19,3	17,9	17,4	25,1	24,2	20,1
District	BUF: Buffalo City MM	34,0	30,3	44,4	38,1	34,5	31,1	26,6	26,6	36,0	33,8	22,8	24,6	22,4
	CPT: Cape Town MM	20,6	20,8	21,8	20,3	17,4	18,4	17,8	16,3	17,2	17,3	27,7	28,0	22,2
	DC1: West Coast DM	33,6	34,9	30,6	32,9	28,3	32,7	20,8	20,2	20,5	22,6		29,0	17,3
	DC2: Cape Winelands DM	20,6	17,5	11,3	10,9	11,1	10,5	18,1	16,0	13,1	11,4		25,2	16,4
	DC3: Overberg DM	33,3	29,5	39,0	35,1	33,0	30,8	24,4	26,2	21,4	17,8		20,3	16,4
	DC4: Garden Route DM	31,4	29,9	18,8	16,4	23,7	18,9	37,2	34,4	26,2	24,9		17,2	16,5
	DC5: Central Karoo DM	7,0	6,2	6,5	5,9	14,3	13,2	19,7	20,4	9,7	9,0		12,7	12,5
	DC6: Namakwa DM	8,6	9,8	5,8	5,9	7,3	8,7	4,9	6,1	6,5	6,4		21,5	17,5
	DC7: Pixley Ka Seme DM	19,9	24,7	30,4	28,8	18,7	18,3	43,9	38,3	27,7	25,7		15,8	13,1
	DC8: ZF Mgcawu DM	21,8	19,9	13,0	13,8	18,5	18,8	11,2	10,0	19,8	18,3		16,5	15,8
	DC9: Frances Baard DM	15,3	15,6	14,6	15,9	21,5	21,3	15,1	13,3	21,8	18,1		14,3	15,7
	DC10: Sarah Baartman DM	5,4	5,1	9,7	10,2	9,0	8,0	5,3	4,2	14,9	15,1		14,6	8,8
	DC12: Amathole DM	1,1	3,2	1,4	1,6	3,1	2,9	6,1	6,0	7,4	5,2		8,7	4,3
	DC13: C Hani DM	6,9	7,7	8,9	9,4	15,6	13,8	13,5	10,9	5,6	5,1		5,9	4,9
	DC14: Joe Gqabi DM	2,5	2,6	3,2	2,6	4,6	3,5	5,2	6,1	3,9	4,1		5,0	5,0
	DC15: OR Tambo DM	7,5	4,9	4,8	4,4	3,1	2,3	5,2	4,2	5,4	4,3		4,6	4,2
	DC16: Xhariep DM	4,3	3,6	4,1	4,1	6,5	5,2	5,0	3,8	7,2	7,8		9,7	10,5
	DC18: Lejweleputswa DM	4,1	4,9	3,4	5,1	7,4	8,7	6,5	6,4	7,2	6,5		18,1	12,0
	DC19: T Mofutsanyana DM	7,3	7,1	7,6	7,7	9,0	10,2	8,9	8,7	7,9	8,0		6,1	9,2
	DC20: Fezile Dabi DM	37,6	38,2	43,1	39,2	19,9	20,3	31,8	28,7	32,7	28,9		23,7	13,2
	DC21: Ugu DM	4,7	4,2	4,7	4,1	4,6	4,0	6,2	4,7	4,5	4,6		7,3	7,1
	DC22: uMgungundlovu DM	15,3	14,6	27,1	25,0	26,0	24,4	19,6	17,5	8,7	7,5		15,7	11,0
	DC23: uThukela DM	0,9	0,6	1,5	1,1	0,3	0,7	1,0	1,3	2,3	1,8		5,0	6,4
	DC24: uMzinyathi DM	11,7	11,5	10,6	7,5	16,4	13,9	8,4	7,4	4,5	4,6		7,0	5,4
	DC25: Amajuba DM	2,0	2,5	2,6	3,1	2,2	3,0	3,7	3,5	2,5	3,1		9,4	7,4
	DC26: Zululand DM	6,0	4,8	7,2	5,9	7,0	6,2	6,2	6,3	6,9	5,0		6,5	5,2
	DC27: uMkhanyakude DM	1,3	0,7	4,6	3,0	2,0	1,6	2,5	1,7	3,3	3,4		3,9	5,0
	DC28: King Cetshwayo DM	0,3	0,2	0,6	0,6	0,9	0,7	17,2	11,5	7,0	5,9		12,5	8,7
	DC29: iLembe DM	4,0	5,0	4,5	4,6	5,9	4,9	11,1	8,8	6,8	5,8		7,3	8,6
	DC30: G Sibande DM	18,2	14,8	21,1	19,3	21,6	19,7	15,8	14,4	22,9	21,4		16,1	13,1
	DC31: Nkangala DM	26,6	25,3	22,4	20,8	21,3	18,0	18,3	16,8	16,2	16,7		13,2	14,8
	DC32: Ehlanzeni DM	7,5	7,2	6,8	6,4	5,9	5,6	5,7	5,0	5,4	5,3		11,8	10,2
	DC33: Mopani DM	3,8	3,7	3,2	2,9	4,9	4,6	7,6	6,4	9,7	9,5		9,4	6,8
	DC34: Vhembe DM	13,0	12,0	8,8	8,8	15,3	12,9	13,3	13,1	11,9	11,6		7,2	6,6
	DC35: Capricorn DM	5,1	3,8	2,8	2,2	6,5	6,0	4,7	4,6	8,8	8,1		6,6	8,3
	DC36: Waterberg DM	13,7	11,6	12,1	10,7	12,9	10,3	16,0	17,6	19,7	16,0		16,7	9,1
	DC37: Bojanala Platinum DM	18,4	19,7	16,3	14,9	23,0	18,3	27,6	25,6	29,8	25,3		13,1	14,0
	DC38: NM Molema DM	13,2	11,8	3,2	3,1	9,2	9,2	9,9	9,0	8,2	7,9		8,1	9,7
	DC39: RS Mompoti DM	3,5	2,6	1,9	1,7	3,6	3,1	2,8	2,2	6,2	7,0		6,2	7,3

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Table 35 (cont.)

		Medical scheme coverage										Stats SA GHS	DHB	Insight med schemes
		NiDS Wave 1 v7.0		NiDS Wave 2 v4.0		NiDS Wave 3 v3.0		NiDS Wave 4 v2.0		NiDS Wave 5 v1.0		2018	2015/16	2019
		15+ years	all ages	15+ years	all ages	15+ years	all ages	15+ years	all ages	15+ years	all ages	all ages	all ages	all ages
Geographic area		2008	2008	2010-2011	2010-2011	2012	2012	2014-2015	2014-2015	2017	2017	2018	2015	2018
District	DC40: Dr K Kaunda DM	48,5	44,9	26,7	21,4	32,6	28,4	20,1	19,8	26,7	26,8		23,7	12,8
	DC42: Sedibeng DM	5,7	6,6	13,3	12,9	7,7	7,4	16,7	15,3	7,8	7,9		19,4	20,8
	DC43: Harry Gwala DM	12,4	10,0	16,7	15,8	9,6	9,2	11,2	8,3	16,5	13,4		6,3	5,6
	DC44: A Nzo DM	5,1	3,5	2,6	1,7	1,8	1,2	5,1	3,4	3,6	3,4		3,5	3,8
	DC45: JT Gaetsewe DM	11,7	9,8	7,9	6,8	25,2	21,3	9,7	8,1	9,2	9,1		12,2	13,9
	DC47: Sekhukhune DM	10,9	9,3	9,8	13,4	12,6	8,8	22,4	20,0	13,2	10,1		7,1	5,6
	DC48: West Rand DM	27,1	26,8	22,5	21,3	21,3	23,7	17,2	16,3	16,8	17,5		24,4	24,1
	EKU: City of Ekurhuleni MM	28,7	27,4	30,9	29,5	28,6	28,6	23,8	21,5	18,9	18,8	23,1	27,9	23,8
	ETH: eThekweni MM	12,2	10,1	15,2	11,8	14,9	11,5	14,5	13,1	13,8	12,6	20,7	19,2	18,9
	JHB: Johannesburg MM	11,1	10,3	14,7	12,2	13,1	11,9	16,5	16,5	17,6	16,4	21,6	33,0	22,2
	MAN: Mangaung MM	27,3	25,5	22,5	23,4	29,8	31,7	26,4	29,3	24,0	22,7	23,7	24,8	20,0
	NMA: N Mandela Bay MM	22,1	21,7	22,5	19,0	9,8	8,9	15,9	15,8	17,3	16,7	20,6	22,6	20,4
	TSH: Tshwane MM	40,2	38,4	38,1	35,2	38,0	36,8	31,5	31,2	36,7	36,0	29,6	33,0	30,6



Notes:

- NiDS = National Income Dynamics Study
- GHS = General Household Survey
- DHB = District Health Barometer
- Insight med schemes = modelled estimates generated by Insight Actuaries using various sources as described in more detail in the DHB 2018/19 (forthcoming).

Table 36: Trends in overall provincial health expenditure by programme, nominal prices (Rand million)

Rand million										
Programme	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
1. Administration	2 701	2 899	3 116	3 019	3 578	3 599	4 313	4 462	4 690	5 129
2. District Health Services	37 963	42 761	47 904	53 586	57 991	64 181	69 854	76 540	83 671	90 978
3. Emergency Health Services	3 479	3 882	4 656	5 079	5 352	5 556	6 025	6 435	7 380	7 671
4. Provincial Hospital Services	20 355	22 763	25 394	27 741	26 420	28 694	29 576	29 675	32 262	34 275
5. Central Hospital Services	13 282	14 670	17 319	18 822	23 559	25 804	29 529	33 736	37 437	41 120
6. Health Sciences and Training	2 966	3 359	3 537	3 755	4 039	4 248	4 529	5 107	4 916	5 037
7. Health Care Support Services	3 005	1 477	1 472	1 640	1 877	1 322	2 834	1 796	1 806	4 661
8. Health Facilities Management	6 705	6 581	8 191	8 967	7 895	7 491	8 514	8 316	8 651	9 014
Local government expenditure	1 532	2 379	2 397	2 859	2 869	3 389	3 730	4 103	4 199	4 858
Other	36	13	3	4	-	-	-	-	0	0
Total	91 952	100 759	113 989	125 473	133 581	144 283	158 903	170 171	185 013	202 744

Source: BAS.

Table 37: Provincial health expenditure by programme per province (Rand million), 2018/19

Rand million										
Programme	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC
1. Administration	5 129	695	311	1 361	811	304	290	224	368	766
2. District Health Services	90 978	12 780	4 454	14 516	20 802	12 916	8 032	2 181	5 952	9 345
3. Emergency Health Services	7 671	1 273	707	1 331	1 447	768	363	334	345	1 102
4. Provincial Hospital Services	34 275	3 532	1 375	8 687	10 964	2 600	1 369	383	1 724	3 642
5. Central Hospital Services	41 120	4 053	2 437	17 134	5 098	1 799	1 223	1 062	1 764	6 550
6. Health Sciences and Training	5 037	777	228	1 107	1 182	548	366	123	386	322
7. Health Care Support Services	4 661	2 501	169	339	486	139	154	113	298	462
8. Health Facilities Management	9 014	1 253	541	1 536	1 761	649	1 260	420	670	923
Local government expenditure	4 858	217	12	2 920	495	83	76	37	88	930
Total	202 744	27 081	10 236	48 931	43 044	19 805	13 132	4 877	11 596	24 042

Source: BAS.

Table 38: District Health Services expenditure by sub-programme per province (Rand million), 2018/19

Rand million	2. District Health Services									
	SA	EC	FS	GP	KZ	LP	MP	NC	NW	WC
2.1 District Management	4 039	974	94	528	299	603	380	200	515	446
2.2 Community Health Clinics	17 975	2 637	987	2 383	4 332	3 377	1 443	476	1 033	1 306
2.3 Community Health Centres	10 235	1 136	152	1 941	1 754	593	953	330	1 229	2 148
2.4 Community-based Services	3 941	570	453	2 082	376	209	18	0	6	227
2.5 Other Community Services	1 721	65	0	0	1 164	67	0	39	387	0
2.6 HIV/AIDS	20 097	2 090	1 225	4 096	5 716	1 574	1 889	539	1 360	1 608
2.7 Nutrition	205	32	11	56	32	5	10	4	4	50
2.8 Coroner Services	672	109	42	225	223	0	0	0	72	0
2.9 District Hospitals	32 002	5 168	1 489	3 205	6 907	6 488	3 338	594	1 346	3 468
2. Other*	91	0	0	0	0	0	0	0	0	91
Grand Total	90 978	12 780	4 454	14 516	20 802	12 916	8 032	2 181	5 952	9 345

Source: BAS.

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Abbreviations

A	
ACLS	advanced cardiac life support
AGYW	adolescent girls and young women
AIDS	Acquired Immune Deficiency Syndrome
AIHA	American International Health Alliance
ANC	antenatal care
ART	antiretroviral therapy
ASRHR	adolescent sexual and reproductive health and rights
AVAC	AIDS Vaccine Advocacy Coalition
AYFS	Adolescent and Youth Friendly Services
AYHP	Adolescent and Youth Health Policy
B	
BAC	Benefits Advisory Committee
BANC	basic antenatal care
BAS	Basic Accounting System
BC	Breast Clinic
BCMP	Bachelor of Clinical Medical Practice
BHF	Board of Healthcare Funders
BMCP	Bachelor of Medicine in Clinical Practice
BMI	body mass index
BNP	breast nurse practitioner
BPD	bronchopulmonary dysplasia
C	
CAMH	Child and Adolescent Mental Health
CCMDD	Centralised Chronic Medicine Dispensing and Distribution
CCP	Comprehensive Cover Plans
CDC	Centers for Disease Control
CDL	Chronic Disease List
CEGAA	Centre for Economic Governance and Accountability in Africa
CEO	chief executive officer
CFR	case fatality rate
CG	conditional grant
CGD	Centre for Global Development
CHC	Community Health Centre
CHW	community health worker
CMS	Council for Medical Schemes
COHSASA	Council for Health Service Accreditation of Southern Africa
CompComm	Competition Commission of South Africa
COPE	Congress of the People
COSUP	Community Oriented Substance Use Programme
CPG	clinical practice guideline
CPI	Consumer Price Index
CRVS	civil registration and vital statistics
CS	community survey
CUP	Contracting Unit for Primary Health Care

CVD	cardiovascular disease
CYPR	couple year protection rate
D	
DBE	Department of Basic Education
DCST	District Clinical Specialist Team
DHIS	District Health Information Software
DHMOs	District Health Management Offices
DHS	Demographic and Health Survey
DICAS	Digital Integration of Clinical Associate Studies
DoH	Department of Health
DREAMS	determined, resilient, empowered, AIDS-free, mentored and safe
DRG	diagnosis-related group
DSD	Department of Social Development
DTP	diphtheria, tetanus and pertussis vaccine
E	
ECD	Early Childhood Development
ECDD	Expert Committee on Drug Dependence
EDL	Essential Drug List
EFF	Economic Freedom Fighters
ELBW	extremely low birth weight
EML	Essential Medicines List
EPAs	Entrustable Professional Activities
EPI	Expanded Programme on Immunisation
F	
FET	Further Education and Training
FP	family planning
G	
G20	Group of Twenty
GA	gestational age
GBD	Global Burden of Disease
GDoH	Gauteng Department of Health
GDP	gross domestic product
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GHS	General Household Surveys
GP	Gauteng Province
GP	general practitioner
GS	global strategy
GSH	Groote Schuur Hospital
H	
HAALSI Network	Health and Aging in Africa: A Longitudinal Study of an INDEPTH Community in South Africa
HAQ	health care access and quality
HASA	Hospital Association of South Africa
HCBPC	Health Care Benefits Pricing Committee
HCD	human-centred design
HCP	healthcare provider
HE2RO	Health Economics and Epidemiology Research Office
HIC	high-income country
HIE	health information exchange
HIS	health information system
HITAP	Health Intervention and Technology Assessment Programme
HIV	Human Immunodeficiency Virus
HMI	Health Market Inquiry

HP	hospital plan
HP	human papillomavirus
HPCSA	Health Professions Council of South Africa
HPD	hypertensive disorder in pregnancy
HPRS	Health Patient Registration System
HRH	human resources for health
HRSA	Health Resources and Services Administration
HSRC	Human Sciences Research Council
HSS	health systems strengthening
HTA	Health Technology Assessment
HTS	HIV testing services
HWWP	Healthcare Workers' Writing Programme
I	
ICD	International Statistical Classification of Diseases
ICHI	International Classification of Health Interventions
ICRM	Ideal Clinic Realisation and Maintenance
ICT	information and communications technology
ICU	intensive care unit
IDI	in-depth interview
IHR	International Health Regulations
IMCI	integrated management of childhood illnesses
IPV	intimate partner violence
ISHP	Integrated School Health Programme
IUGR	intrauterine growth restriction
IVH	intraventricular haemorrhage
K	
KMC	kangaroo mother care
KZN	KwaZulu-Natal
L	
LBW	low birth weight
LMIC	low- and middle-income countries
LMP	last menstrual period
M	
MDG	Millennium Development Goal
MDR-TB	multidrug-resistant tuberculosis
MHI	mandatory health insurance
MLNF	multilateral negotiation forum
MMC	medical male circumcision
MNCWH	Maternal, Newborn, Child and Women's Health
MP	Mpumalanga
MPH	Mitchell's Plain Hospital
MPS	Medical Protection Society
MTEF	medium-term expenditure framework
N	
NAFCI	National Adolescent Friendly Clinic Initiative
NCDs	non-communicable diseases
NDMP	National Drug Master Plan
NDoH	National Department of Health
NDP	National Development Plan
NEC	necrotising enterocolitis
NEET	not in employment, education or training
NGO	non-governmental organisation

NHA	National Health Act
NHC	National Health Council
NHI	National Health Insurance
NHIF	National Health Insurance Fund
NHLS	National Health Laboratory Service
NHS	National Health Service
NHSO	National Health Security Office
NICE	National Institute for Health and Care Excellence
NiDS	National Income Dynamics Study
NIDS	National Indicator Data Set
NMR	neonatal mortality rate
NQIP	National Quality Improvement Plan
NSH	New Somerset Hospital
NSP	National Strategic Plan
O	
OECD	Organisation for Economic Co-operation and Development
OHSC	Office of Health Standards Compliance
OMRO	Outcome Measurement and Reporting Organisation
OOP	out-of-pocket
OT	occupational therapy
OTT	occupational therapy technician
P	
PACASA	Professional Association of Clinical Associates in South Africa
PCNs	Practice Code Numbering System
PCP	partial cover plans
PD	PinkDrive
PDoh	Provincial Departments of Health
PEPFAR	US President's Emergency Plan for AIDS Relief
PERSAL	Personnel and Salary Administration System
PF	Project Flamingo
PHC	primary health care
PHEIC	public health emergency of international concern
PHI	private health insurance
PLHIV	people living with HIV
PMB	Prescribed Minimum Benefit
PMTCT	prevention of mother-to-child transmission
POA	programme of action
POPIA	Protection of Personal Information Act
PPIP	Perinatal Problem Identification Programme
PPROM	preterm prelabour rupture of membranes
PR	principal recipient
PRICELESS SA	Priority Cost Effective Lessons for Systems Strengthening South Africa
PROMs	patient reported outcome measures
PtB	preterm birth
PTL	preterm labour
PuP	pick-up-point
Q	
QS	Quality Standards
R	
RAM	risk adjustment mechanism
RDS	respiratory distress syndrome
RHAP	Rural Health Advocacy Project

RMNCH	reproductive, maternal, newborn and child health
RMS	rapid mortality surveillance
RtHB	Road to Health Booklet
RWOPs	remuneration of work outside of the public sector
S	
SA	South Africa
SABSSM	South African National HIV Prevalence, Incidence, Behaviour and Communication Survey
SADHS	South African Demographic and Health Surveys
SAG	South African Government
SAGE Study	Study on Global Ageing and Adult Health
SALGA	South African Local Government Association
SAPC	South African Pharmacy Council
SBF	Service Benefits Framework
SDGs	Sustainable Development Goals
SEP	single exit price
SEQ	socio-economic quintile
SFH	symphysis fundal height
SGA	small for gestational age
SLNB	sentinel lymph node biopsy
SPTB	spontaneous preterm birth
SRH	sexual and reproductive health
SSRH	supply-side regulator for health
Stats SA	Statistics South Africa
STGs	Standard Treatment Guidelines
STI	sexually transmitted infection
SVS	stock visibility system
T	
TAC	Treatment Action Campaign
TB	tuberculosis
TC	telephone clinic
TROA	total number living with HIV and retained on ART
U	
UHC	universal health coverage
UHS	universal health system
UNAIDS	United Nations AIDS Programme
UNFPA	United Nations Population Fund Association
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
V	
VAT	value-added tax
VH	Victoria Hospital
VMMC	voluntary male medical circumcision
W	
WBOT	Ward-Based Outreach Team
WBPHCOTS	Ward Based Primary Healthcare Outreach Teams
WHO	World Health Organization
WISN	Workload Indicators of Staffing Need
Wits	University of the Witwatersrand
Y	
YLLs	years of life lost



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