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REVIEW ARTICLE

A Targeted Review of Available Data Sources to Support Evidence-Informed Decisions: Implications for Health Technology Assessment in South Africa

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Abstract

Background Universal health coverage (UHC) is central to the global health agenda. South Africa is in the process of developing a single financing system for UHC through a National Health Insurance (NHI). The NHI Act legislates the establishment of a health technology assessment (HTA) body to develop and, over time, add to an explicit package of health services funded by the NHI. This study aims to identify data that is publicly available for conducting HTA using the South African Values and Ethics for Universal Health Coverage (SAVE-UHC) framework.

Methods A targeted literature review was conducted to identify data sources for conducting HTA using the SAVE-UHC framework. The SAVE-UHC lists 12 domains that can be used to conduct HTA. We searched for published literature on PubMed using the following search terms: 'South Africa', 'healthcare', 'data sources', 'databases' and 'evidence' in the Title/Abstract fields. We also used our experience in the field to search for existing data from local and international organisations. We then mapped the data sources to the SAVE-UHC domains.

Results South Africa has some data to conduct HTA using the SAVE-UHC domains. Data for six of the domains (burden of disease, harms and benefits, cost effectiveness, budget impact, personal financial impact and equity) is available from local and international databases. Some data for the domain 'system factors and constraints' is available from the Office of Health Standards Compliance and the Human Resource Strategy for Health. Data on the five remaining domains (respect and dignity, solidarity and social cohesion, impact on personal relationships, impact on safety and security and ease of suffering) is limited.

Conclusion There are a number of data sources available to inform health technology assessment in South Africa. However, the data sources available only measure some of the value elements in the SAVE-UHC framework. Thus, South Africa needs to invest in healthcare data collection and management under the NHI to ensure healthcare decisions are made using relevant and recent evidence.

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Key Points for Decision Makers

South Africa is in the process of institutionalising health technology assessment, yet it is not clear what data are available to inform the process.

The review shows that some data exist from local and international organisations that can be used for health technology assessment.

There is, however, a need to invest in more data collection and management under the National Health Insurance to ensure that decisions are informed by relevant and recent data.

1 Background

Achievement of Universal Health Coverage (UHC) is central to the global health agenda. South Africa aims to achieve UHC through a National Health Insurance (NHI) system. The NHI is a single-payer financing system that aims to provide quality, affordable personal services to all South Africans, regardless of their socioeconomic status [1]. According to the NHI Act of 2023, funding of services will be based on the existence of cost-effectiveness evidence as determined by health technology assessment (HTA) [2].

The NHI Act legislates the establishment of an HTA body to develop and, over time, add to an explicit package of health services. HTA is a systematic process for evaluating the properties, effects and impact of health technologies including medicines, devices, as well as procedures for the purpose of informing decision making in health [3, 4]. The idea behind HTA is to inform the adoption of health technologies that satisfy various pre-determined criteria such as cost effectiveness, clinical efficacy, safety, as well as moral and ethical considerations, among others [5].

The adoption of HTA for use in decision making can be traced back to 1976 following the first publication on the subject by United States Office of Technology Assessment (OTA) [6]. The use of HTA has since spread to Europe, Asia, and Latin America, with the support mainly of international bodies such as the World Health Organization and the World Bank [7–10]. While HTA is well established in high-income countries, HTA remains intangible in many low- and middle-income countries. In sub-Saharan Africa, the establishment of HTA has struggled to gain traction, due to the dearth of skills, low awareness of HTA and lack of data and evidence [11]. While efforts are being made to institutionalise HTA in various parts of sub-Saharan Africa such as Kenya, Ghana [12] and South Africa [13], availability of data remains an issue of concern for researchers and policymakers. In Ghana, a study by Hollingworth et al. has shown that while data for some domains for conducting HTA exist, the data vary in extent and quality [14]. Similarly in Kenya, the availability of quality data, HTA methods and process guidelines have been identified as barriers to full implementation of HTA processes [15, 16].

The availability of data for populating HTA models has a direct bearing on the outcome of analyses. Without data or a clear understanding of which data exist, and the reliability thereof, HTA processes could be undermined, leading to suboptimal resource allocation and consequently below-par health outcomes. This study therefore aims to comprehensively identify, explore, and evaluate data that are publicly available for conducting HTA in South Africa.

2 Methods

A targeted literature review was conducted to identify data sources for measuring different domains in HTA. Our HTA domains were based on the South African Ethics and Values for Universal Coverage (SAVE-UHC) framework. The SAVE-UHC framework was developed by a multidisciplinary team of experts in South Africa to guide priority setting and the allocation of scarce healthcare resources [17]. The framework sought to transcend beyond the traditional domains of cost effectiveness, burden of disease, health gains, and budget impact, to include equity, respect and dignity, personal financial impact, personal relationships, safety and security, ease of suffering, social cohesion and solidarity. We started by first identifying the data needs for measuring the SAVE-UHC framework. For this we relied on the SAVE-UHC domain definitions [17], and the work done by Murphy et al. [18]. Table 1 shows the SAVE-UHC domains, and the key data needed to measure each one.

2.1 Literature Search Methods

We employed a targeted literature review to ascertain the most relevant and useful data sources to measure each of the SAVE-UHC domains. A targeted review was considered appropriate given the need to identify policy-relevant evidence and grey literature. We searched for published literature (between September and October 2025) on PubMed using the following search terms: ‘South Africa’, ‘healthcare’, ‘data sources’, ‘data bases’, ‘cost-effectiveness’ and ‘evidence’ in the Title/Abstract fields. Articles were included if they contained relevant data sources or databases which could be useful for decision making in South Africa. Articles were excluded if they did not provide any data sources or databases which could be used in further research on

Table 1 SAVE-UHC domains and the relevant data required

SAVE-UHC domains	Key data needed
Burden of the health condition—provides information on scale, severity, and distribution regarding who is affected by the health issue with respect to age, sex, geographical location, and other population characteristics	Incidence and prevalence rates Mortality rates Population affected Disease severity indicator Preventable cases Rarity/unmet need indicator Population distribution of health
Expected health benefits and harms—information about the intervention, evidence of its effectiveness, and size and duration of health improvement(s) as well as any harms or side effects, based on international and local studies	Clinical effectiveness Risk reduction Health-related quality of life Adverse events
Cost effectiveness—information about the additional cost per output	Direct cost Indirect cost Effectiveness
Budget impact—information about the total cost for the payer to cover the intervention	Target population Resource use and utilisation Unit costs
Equity—information about an intervention may promote equitable distribution of resources	Socio-demographic data Disease burden by subgroup Coverage Distribution of health gains and financial protection
Respect and dignity—information about ways an intervention may either positively or negatively affect people's experience of self-respect, dignity and personal identity and/or their opportunities to make meaningful decisions about their wellbeing in line with their personal values, beliefs and life plans	Patient experience Cultural and religious appropriateness
Personal financial impact—information about how much people may have to pay out of pocket to receive care, and ways in which health interventions may reduce financial hardship by enabling people to work and earn income	Out-of-pocket payments Productivity loss Financial risk protection through insurance Catastrophic health expenditure averted
Impact on personal relationships—information about how an intervention may impact on important personal relationships, for better or worse	Social function measure
Ease of suffering—information about any benefits, beyond what is counted in the health benefits section, that relate to easing pain and suffering	Reduction in physical or emotional pain levels
Impact on safety and security—information about whether covering a given health intervention has any considerations that relate to people's exposure to unsafe environments or dangerous encounters	Exposure to unsafe environments
Solidarity and social cohesion—information about whether an intervention has the potential to unify people within a society or drive them apart	Coverage of marginalised groups Social cohesion indicator
System factors and constraints—factors such as relevant health facilities, healthcare worker capacity and availability, medical equipment and supplies, and other broader systems factors, such as access to electricity, oxygen, inadequate or unreliable internet connectivity, clean water, transportation and road infrastructure	Facility readiness and availability of essential supplies Workforce capacity and training Supply chain alignment

Sources: Blaauw et al. [17] and Murphy et al. [18]

health in South Africa. Further searches were conducted on Google using 'cost-effectiveness', 'economic evaluation', and 'budget-impact analysis' as search strategies. No date restriction was applied but only articles in English were considered. Grey literature searches were conducted with the following prompt: 'Health related data sources in South Africa'. Grey literature sources included government reports, institutional websites, and international data platforms. Each data source, research article and website was assessed for relevance and was only included if the site provided any data which could be used in research or had been used in research in South Africa. Two researchers (junior—CH and senior—ET) undertook data collection. The senior researcher further assessed the suitability of inclusion for each data source or database. Given the exploratory and policy-oriented nature of the study, selection was purposive and iterative, prioritising relevance to HTA decision making.

2.2 Data Extraction and Synthesis

Data extraction tables were generated in Microsoft Excel to record the data sources. In the first table, data sources known

to the authors based on previous work was recorded. In this table, the data name, source, collection dates, type of data collected, population, accessibility and website links were recorded. In the second table, databases and sources were captured based on Google searches. Similar to the first table, data name, source, collection dates, type of data collected, population, accessibility and website links were recorded. In the third table, data sources from research articles were recorded. In this table, the article type, year of publication, type of data collected, data source, population, website link, data accessibility, and availability were recorded. This was followed by a synthesis of the data availability and mapping against the SAVE-UHC framework domains.

3 Results

The results of our targeted review for relevant data sources for the SAVE-UHC framework are summarised in Fig. 1 and Table 2. Figure 1 summarises the data sources for each SAVE-UHC domain. Table 1 summarises the key data needed, data sources, institution that produces the data, the methods for collecting the data and frequency, data availability, and the website where the data is stored.

3.1 Burden of the Health Condition

The SAVE-UHC states that the 'burden of the health condition' domain provides information on the scale and severity of a health condition by age, sex, and geographical location. We identified the Global Burden of Disease (GBD) database, the WHO Global Health Observatory (GHO), the General Household Survey (GHS), the South African Medical Research Council (SAMRC), and the South African Demographic Health Survey (SADHS) as possible data sources. The GBD database by the Institution for Health Metrics and Evaluation (IHME) provides data (incidence, prevalence, mortality) on the burden of diseases, injuries and risk factors by different countries, including South Africa. The database allows filtering of the indicator by different age

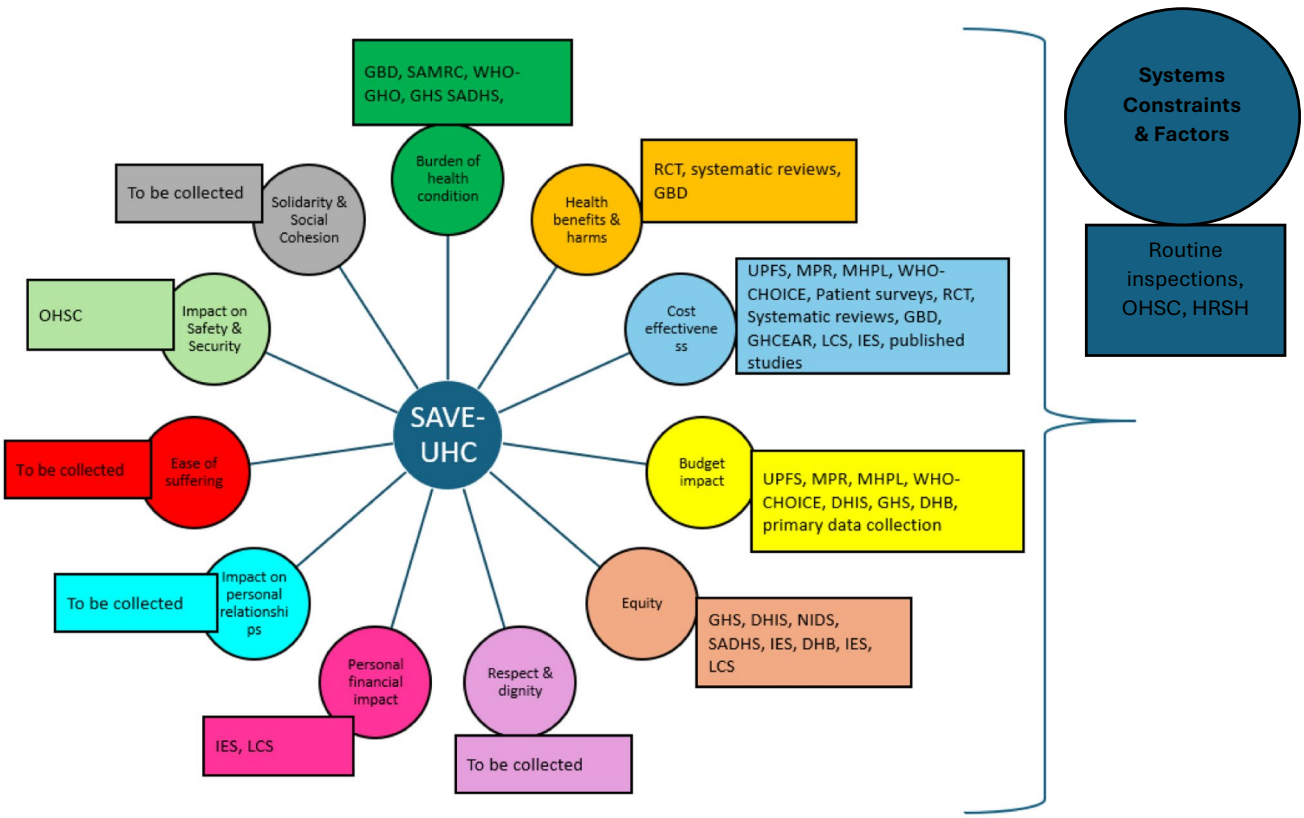

Fig. 1 Linking South African Values and Ethics for Universal Health Coverage (SAVE-UHC) framework with data sources. *DHB* District Health Barometer, *DHIS* District Health Information System, *GBD* global burden of disease, *GHCEAR* Global Health Cost Effectiveness Analysis Registry, *GHS* General Household Survey, *HRSH* Human Resource Strategy for Health, *IES* Income and Expenditure Survey, *LCS* Living Conditions Survey, *MHPL* Master Health Product List *MPR* Medicine Price List, *NIDS* National Income Dynamics Study, *OHSC* Office of Health Standards Compliance, *RCT* randomised control trial, *SADHS* South African Demographic Health Survey, *SAMRC* South African Medical Research Council, *UPFS* Uniform Patient Fee System, *WHO-CHOICE* World Health Organization—Choosing Interventions that are Cost-Effective, *WHO-GHO* World Health Organization—Global Health Observatory

Table 2 Summary of key data sources for health technology assessment (HTA) in South Africa

SAVE-UHC/HTA-related domain	Key data	Data source	Institution	Collection method and frequency	Website	Data availability	Notes
Burden of the health condition	Incidence Prevalence Mortality	Burden of disease	SAMRC	Ongoing	https://www.samrc.ac.za/research/intramural-research-units/BOD	Available upon request	Data includes local population health and socioeconomic data including (1) vital events such as births and deaths and cause of deaths; (2) residence and migration; (3) socioeconomic status and health inequalities; (4) disease monitoring
		GBD study	IHME	Health information system, latest 2023	https://ghdx.healthdata.org/gbd-2023	Available online	Data on global burden of diseases, injuries, and risk factors
		WHO-GHO	WHO	Countries submit data to WHO	https://www.who.int/data/gho	Available online	Datasets on local mortality and burden, maternal and child health, non-communicable diseases, injuries and violence
		GHS	Stats SA	Annual survey since 2002	https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/961 https://www.statssa.gov.za/?page_id=16405	Available upon request	Local self-reported illness and chronic conditions
		SADHS	NDoH Stats SA SAMRC DataFirst	Survey, 1998, 2003, 2016	https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/729	Available upon request	Local self-reported and measurements of key health indicators
		Mortality and causes of death	Stats SA	Registries, periodic	https://www.statssa.gov.za/?page_id=1854&PPN=P0309.3	Available upon request	Local data on leading cause of death in South Africa
	Disability weights	GBD disability weights study	IHME	Large, population-based surveys	https://ghdx.healthdata.org/record/ihme-data/gbd-2019-disability-weights	Available online	Global data on disability representing the magnitude of health loss associated with specific health outcomes

Table 2 (continued)

SAVE-UHC/HTA-related domain	Key data	Data source	Institution	Collection method and frequency	Website	Data availability	Notes
Health benefits and harms	Outcomes	Published RCT studies	National Library of Medicine	Studies from over 200 countries	https://clinicaltrials.gov/	Available upon request	Global and local effectiveness data from trials
		Published systematic review studies	Cochrane/research databases	Systematic reviews	https://www.cochranelibrary.com/	Available online	Global and local data on effectiveness of health interventions
		GBD disability weights study	IHME	Large, population-based surveys	https://ghdx.healthdata.org/record/ihme-data/gbd-2019-disability-weights	Available online	Global data on disability representing the magnitude of health loss associated with specific health outcomes
	Quality of life	Published quality-of-life studies	Research databases	Research studies, different years	https://pubmed.ncbi.nlm.nih.gov/	Available online	Global and local quality-of-life data
		Value sets studies	EuroQol	Population surveys for different countries	https://euroqol.org/information-and-support/resources/value-sets/	Available online and upon request	Source of value sets from other countries. No value sets for South Africa, value sets of Zimbabwe have been used in other studies
Cost effectiveness	Healthcare costs	UPFS	NDoH	Annual publication	https://www.health.gov.za/uniform-patient-fee-schedule/	Available online	Local tariffs for different services in the public sector
		MPR	NDoH	Costs of medicines are taken from Department of Health's database on medicine prices and updated on the site for consumers to use	http://www.mpr.gov.za/PublishedDocuments.aspx#DocCatId=21	Available online	Local Single Exit Prices of medicines
		MHPL	NDoH	Circulars and reports on the tenders awarded for various pharmaceutical products in public health	Tenders – National Department of Health	Available online	Local pharmaceutical prices in the public healthcare system

Table 2 (continued)

SAVE-UHC/HTA-related domain	Key data	Data source	Institution	Collection method and frequency	Website	Data availability	Notes
		WHO-CHOICE unit cost database	WHO	Data collected between 2008 and 2010 through literature reviews, website searches and public call for data Base year 2010	https://www.who.int/teams/health-systems-governance-and-financing/economic-analysis/costing-and-technical-efficiency/quantities-and-unit-prices-(cost-inputs)/econometric-estimation-of-who-choice-country-specific-costs-for-inpatient-and-outpatient-health-service-delivery	Available online	Local unit-cost estimates for outpatient visits and inpatient care, training costs, programme costs, excluded drugs/diagnostics
	OOP					Requires primary data collection	Local OOP expenditure for accessing health services
		LCS	Stats SA	Surveys every 5–6 years. Latest 2014/15	https://isibaloweb.statssa.gov.za/pages/surveys/pss/lcs/lcsp.php	Available upon request	Local household consumption and expenditure, OOP health spending
		IES	Stats SA	Survey, every 5–7 years. Latest 2022/23	https://www.statssa.gov.za/?p=17995	Available upon request	Local household spending data on health
	Outcomes	Published RCT studies	National Library of Medicine	Clinical trials, different years	https://clinicaltrials.gov/	Available upon request	Global and local clinical outcomes data specific to a health technology
		Published systematic review studies	Cochrane	Systematic reviews, different years	https://www.cochranelibrary.com/	Available online	Global and local data on effectiveness of interventions
		GBD disability weights study	IHME	Large, population-based surveys	https://ghdx.healthdata.org/record/ihme-data/gbd-2019-disability-weights	Available online	Global data on disability representing the magnitude of health loss associated with specific health outcomes
	Quality of life	Published quality-of-life studies	Research databases	Research studies, different years	https://pubmed.ncbi.nlm.nih.gov/	Available online	Global and local quality of life data

Table 2 (continued)

SAVE-UHC/HTA-related domain	Key data	Data source	Institution	Collection method and frequency	Website	Data availability	Notes
		Value sets studies	EuroQol	Population surveys for different countries	https://euroqol.org/information-and-support/resources/value-sets/	Available online and upon request	Source of value sets from other countries. No value sets for South Africa, value sets of Zimbabwe have been used in other studies
		Cost-effectiveness registry	Center for the Evaluation of Value and Risk in Health	Registry of research literature on the economic value of global health interventions Data up to 2020	https://cevr.tuftsmedicalcenter.org/databases/gh-cea-registry	Available upon request	Global and local data on cost effectiveness of interventions
		Published HTA studies	International HTA database	Ongoing	HTA Database - Home	Available online	Global and local data on effectiveness and cost effectiveness of interventions
Budget impact	Healthcare costs	UPFS	NDoH	Annual publication	https://www.health.gov.za/uniform-patient-fee-schedule/	Available online	Local tariffs for different services in the public sector
		MPR	NDoH	Costs of medicines are taken from Department of Health's database on medicine prices and updated on the site for consumers to use	http://www.mpr.gov.za/PublishedDocuments.aspx#DocCatId=21	Available online	Local Single Exit Prices for medicines
		MHPL	NDoH	Circulars and reports on the tenders awarded for various pharmaceutical products in public health	Tenders – National Department of Health	Available online	Local pharmaceutical prices in the public healthcare system

Table 2 (continued)

SAVE-UHC/HTA-related domain	Key data	Data source	Institution	Collection method and frequency	Website	Data availability	Notes
		WHO-CHOICE unit cost database	WHO	Data collected between 2008 and 2010 through literature reviews, website searches and public call for data Base year 2010	https://www.who.int/teams/health-systems-governance-and-financing/economic-analysis/costing-and-technical-efficiency/quantities-and-unit-prices-(cost-inputs)/econometric-estimation-of-who-choice-country-specific-costs-for-inpatient-and-outpatient-health-service-delivery	Available online	Local unit-cost estimates for outpatient visits and inpatient care, training costs, programme costs, excluded drugs/diagnostics
						Requires primary data collection	Research studies such as time-motion studies required to collect data on time spent on administering health care services needed
	Population and eligibility	DHIS	NDoH	Monthly services data from all public health facilities	https://dhis2.org/	Available upon request	Local service delivery/utilisation of key indicators such antenatal care, immunisations, HIV and chronic care
		GHS	Stats SA	Annual survey since 2002	https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/961 https://www.statssa.gov.za/?page_id=16405	Available upon request	Local self-reported illness and chronic conditions

Table 2 (continued)

SAVE-UHC/HTA-related domain	Key data	Data source	Institution	Collection method and frequency	Website	Data availability	Notes
		DHB	HST	Data are drawn from the web-based District Health Information System (WebDHIS), Stats SA surveys, the National Treasury Basic Accounting System (BAS) and the Personnel Administration System (PERSAL). Annual publication	https://dhb.hst.org.za/	Available upon request	Local overall view of district performance. Includes indicators on reproductive, maternal, child health, infectious disease, non-communicable diseases Highlights inequities in health outcomes
	Utilisation	DHIS	NDoH	Monthly services data from all public health facilities	https://dhis2.org/	Available upon request	Local service delivery/utilisation of key indicators such antenatal care, immunisations, HIV and chronic care
Equity	Population distribution of health	GHS	Stats SA	Annual survey since 2002	https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/961 https://www.statssa.gov.za/?page_id=16405	Available upon request	Local self-reported illness and chronic conditions
		DHIS	NDoH	Monthly services data from all public health facilities	https://dhis2.org/	Available upon request	Local service delivery/utilisation of key indicators such antenatal care, immunisations, HIV and chronic care
		NIDS	UCT	In-person interviews, approximately every 2–3 years	https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/NIDS/?page=1&sort_by=title&sort_order=asc&ps=15&repo=NIDS	Available upon request	Local household consumption and expenditure, self-reported health
		SADHS	NDoH Stats SA SAMRC DataFirst	Survey, 1998, 2003, 2016 Next, 2026	https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/729		Local self-reported and measurements of key health indicators e.g., antenatal care, immunisation, stunting

Table 2 (continued)

SAVE-UHC/HTA-related domain	Key data	Data source	Institution	Collection method and frequency	Website	Data availability	Notes
		IES	Stats SA	Survey every 5–7 years. Latest 2022/23	https://www.statssa.gov.za/?p=17995	Available upon request	Local household spending data on health
	Coverage	DHB	HST	Data are drawn from the web-based DHIS (WebDHIS), Stats SA surveys, the National Treasury Basic Accounting System (BAS) and the Personnel Administration System (PERSAL). Annual publication	https://dhb.hst.org.za/	Available upon request	Local overall view of district performance Includes indicators on reproductive, maternal, child health, infectious disease, non-communicable diseases Highlights inequities in health outcomes
	OOP payments	IES	Stats SA	Survey every 5–7 years. Latest 2022/23	https://www.statssa.gov.za/?p=17995	Available upon request	Local household spending data on health
		LCS	Stats SA	Surveys every 5–6 years. Latest 2014/15	https://isibaloweb.statssa.gov.za/pages/surveys/pss/lcs/lcsp.php	Available upon request	Local household consumption and expenditure, OOP health spending
						Requires primary data collection	Local patient surveys could be used to collect OOP expenditure data for accessing health services
	Equity weights	IES	Stats SA	Survey every 5–7 years. Latest 2022/23	https://www.statssa.gov.za/?p=17995	Available upon request	Local household spending data on health
Respect and dignity	Cultural and religious appropriateness					Requires primary data collection	Local data on the impact of health technologies on respect and dignity
Impacts on personal financial situation	OOP payments	IES	Stats SA	Survey every 5–7 years. Latest 2022/23	https://www.statssa.gov.za/?p=17995	Available upon request	Local household spending data on health
		LCS	Stats SA	Surveys every 5–6 years. Latest 2014/15	https://isibaloweb.statssa.gov.za/pages/surveys/pss/lcs/lcsp.php		Local household consumption and expenditure, OOP health spending

Table 2 (continued)

SAVE-UHC/HTA-related domain	Key data	Data source	Institution	Collection method and frequency	Website	Data availability	Notes
Impact on personal relationships	Caregiver burden or relief					Requires primary data collection	Local data on the impact of a health technology on personal relationships
Ease of suffering	Reduction in physical or emotional pain levels					Requires primary data collection	Local data on how a health technology eases physical and emotional pain levels needed. Patient-reported outcome measures and clinical observations could be used
Impact on safety and security	Safety of healthcare facilities and service environments	Routine inspections	OHSC	Annual	https://ohsc.org.za/publications-report-2/	Available online	Local performance data (user rights, clinical support services, facilities and infrastructure, governance and human resources Compliance data with national standards
Solidarity and social cohesion	Coverage of marginalised groups					Requires primary data collection	Local data on how a health technology encourages solidarity and social cohesion
	Community participation					Requires primary data collection	
System factors and constraints	Facilities and infrastructure	Routine inspections	OHSC	Annual	https://ohsc.org.za/publications-report-2/	Available online	Local performance data (user rights, clinical support services, facilities and infrastructure, governance and human resources Compliance data with national standards
	Workforce capacity and training	2030 Human Resources for Health Strategy	NDoH	Periodic	https://www.health.gov.za/wp-content/uploads/2023/06/2030-HRH-Strategy-Final.pdf	Available online	Local workforce gaps, distribution, training, actions needed for NHI

Table 2 (continued)

SAVE-UHC/HTA-related domain	Key data	Data source	Institution	Collection method and frequency	Website	Data availability	Notes
	Facility readiness and availability of essential services	National Health Care Facilities Baseline Audit	NDoH	2011–2012	https://www.hst.org.za/publications/HST%20Publications/NHFA_webready_0.pdf	Available online	Local data on positive and caring attitudes, patient safety and security, cleanliness, availability of medicines and supplies, waiting times

DHB District Health Barometer, *DHIS* District Health Information System, *GBD* global burden of disease, *GHCEAR* Global Health Cost Effectiveness Analysis Registry, *GHS* General Household Survey, *HRSH* Human Resource Strategy for Health, *HST* Health System Trust, *HTA* health technology assessment, *ICMS* Ideal Clinic Monitoring System, *IES* Income and Expenditure Survey, *IHME* Institution for Health Metrics and Evaluation, *LCS* Living Conditions Surveys, *MHPL* Master Health Product List, *MPR* Medicine Price Registry, *NDoH* National Department of Health, *NIDS* National Income Dynamics Study, *OHSC* Office of Health Standards Compliance, *OOP* out-of-pocket, *RCT* randomised control trial, *SADHS* South African Demographic Health Survey, *SAMRC* South African Medical Research Council, *SAVE-UHC* South African Values and Ethics for Universal Health Coverage, *Stats SA* Statistics South Africa, *UCT* University of Cape Town, *UPFS* Uniform Patient Fee System, *WHO-CHOICE* World Health Organization—Choosing Interventions that are Cost-Effective, *WHO-GHO* World Health Organization—Global Health Observatory

groups. The GHO was also identified as a possible source of leading causes of death, incidence data, and mortality data by different age groups. Locally, surveys (GHS, SADHS) by Statistics South Africa (Stats SA) were identified as possible sources of self-reported prevalence of different conditions. The GHS, which is conducted annually, provides data on individuals' self-reported illnesses and chronic conditions. The SADHS, which was last conducted in 2016, also provides self-reported health conditions. Data from these surveys is available on the University of Cape Town's DataFirst open portal. The SAMRC also collects data on population health and socioeconomic data including vitals events such as births and deaths and cause of deaths. The mortality and causes of death reports by Stats SA and SAMRC were also identified as a source of data on mortality by gender and different age groups in South Africa [19].

3.2 Health Benefits and Harms

This domain provides information about the effectiveness, size, and duration of health improvements and harms and or side effects of an intervention. We identified randomised controlled trials (RCT), systematic reviews, and other published studies as possible sources of effectiveness data. For this we identified ClinicalTrials.gov and the Cochrane Library as possible sources of RCT and systematic reviews respectively. Other published studies that have generated or used effectiveness data were also identified as possible sources. To measure benefits such as quality of life, we identified current published data and new surveys as possible sources of data.

3.3 Cost Effectiveness

Health care costs and effectiveness data are required to measure the cost-effectiveness domain. We identified different sources for the healthcare costs. The Uniform Patient Fee Schedule (UPFS), the Master Health Product List (MHPL), the Medicine Price Registry (MPR), and the WHO-CHOICE cost database were identified as sources of unit cost data for a cost-effectiveness analysis. The UPFS is published by the National Department of Health (NDoH) and contains tariffs for different services such as professional fees and facility fees in the public sector. The MHPL, also published by the NDoH, includes price points for products approved for procurement within the public health sector. We also identified the MPR as a source of unit cost data for pharmaceutical products not offered in the public sector. Similar to the harms and benefits domain, ClinicalTrials.gov and the Cochrane Library were identified as sources for the effectiveness measure. The Global Burden of Disease disability weights by IHME was identified as a source of data

for estimating disability-adjusted life years (DALYs). For quality-adjusted life years (QALYs), we identified EuroQol as a source of data for utility weights from other countries as utility weights for South Africa do not exist. We also identified Tufts Medical Centre as a source of data for published cost-effectiveness studies.

3.4 Budget Impact

Estimating the budget impact of healthcare interventions requires data on healthcare costs, population under consideration and eligibility, as well as utilisation. For healthcare costs, similar sources as those of the cost-effectiveness domain were identified. For population and eligibility, we identified the district health information system (DHIS) as a possible source of data on the population currently in need and the population eligible for intervention. The DHIS by the NDoH collects data on monthly utilisation of health service at the district level. Similar data is analysed and published by the Health Systems Trust (as district health barometer) to show overall performance of different districts. The GHS was also identified as a possible source as it contains data on self-reported illnesses, which give an indication of the prevalence rates and their gender differences.

3.5 Equity

The equity domain requires information about how an intervention may promote equitable distribution of resources. Measuring equity requires sociodemographic data, disease burden by different subgroups, intervention coverage, and possible distribution of health gains and financial protection. For the sociodemographic indicator, we identified the GHS, the DHIS, National Income Dynamics Study (NIDS), SADHS, and the Income and Expenditure Survey (IES) as possible data sources. These sources were identified as equity requires combining socioeconomic, health, and service delivery data across multiple sources. Key equity variables identified in the GHS included education, employment status, geography, access to services, and demographics data. From the NIDS survey, key equity variables include detailed income and consumption, wealth indicators, education, employment dynamics, household composition, and health variables in a longitudinal format. Similar equity variables (wealth index, education, geography, gender) are collected in SADHS. The IES, which is conducted every 5–7 years (latest 2022/23), was also identified as a source of data as it collects household spending data on health. The Living Conditions Survey (LCS), which collects data on household consumption, expenditure, and out-of-pocket (OOP) spending, was also identified as a possible source of data.

3.6 Respect and Dignity

This domain requires information about ways an intervention may affect self-respect, dignity, and personal identity. While we identified surveys as a way of collecting the required data, no specific data sources were identified for this domain. Patient group discussions would also be appropriate to discuss whether an intervention is appropriate considering cultural and religious norms.

3.7 Personal Financial Impact

Information about OOP payments to receive care and the impact of an intervention on personal finances is required for the personal financial impact domain. We identified the IES (2022/23) as a possible source of spending as the survey collects data on household spending on health. This baseline data can be used to estimate the impact of a new intervention if it were to be paid out of pocket.

3.8 Impact on Personal Relationships

The impact on personal relationships domain requires information on whether an intervention will worsen or better personal relationships. No specific data sources were identified for this domain. This domain will require surveys with patients as well as caregivers to collect data on the impact of a specific intervention.

3.9 Ease of Suffering

This domain prompts consideration of interventions that ease pain and suffering beyond what is offered in the health package. Key data needed include the intervention's ability to reduce physical or emotional pain levels and patients' reported comfort and relief. This domain will also require surveys with patients as well as caregivers using instruments such as the EQ-5D to collect data on specific interventions.

3.10 Impact on Safety and Security

This domain encourages decision makers to assess whether covering a given health intervention has any considerations that relate to people's exposure to unsafe environments or dangerous encounters. We identified the Routine Inspection by the Office of Health Standards (OHSC) as sources of baseline data for this domain.

3.11 Solidarity and Social Cohesion

This domain addresses questions about whether an intervention has the potential to unify people within a society or drive them apart. No specific data sources were identified.

Observation could, however, be used to see if interventions encourage solidarity or social cohesion.

3.12 System Factors and Constraints

The SAVE-UHC framework identifies relevant health facilities, healthcare worker capacity and availability, medical equipment and supplies, and other broader systems factors, such as access to electricity, oxygen, inadequate or unreliable internet connectivity, clean water, transportation, and road infrastructure as constraints that can hamper the delivery of an intervention. We identified facility audits and annual reports as sources of data for some of these indicators. The National Health Care Facilities Baseline Audit (2011–2012) provides a baseline assessment of public sector facilities in South Africa. The audit captures indicators for support services (security, cleaning, catering, maintenance, technology services), bulk supplies (water, electricity, waste removal) clinical services (e.g., immunisation, contraceptive, cervical cancer screening), hospital services (cardiology unit, high care unit, transplant unit), therapeutic services, human resources, infrastructure, technology, medicine supplies, and management. The Office of Health Standards Compliance (OHSC) was also identified as a source of system factors and constraints as it conducts statutory inspections against defined norms and standards.

4 Discussion

The results of the targeted review show that some data exist to measure the HTA domains captured in the SAVE-UHC framework. The review shows that most of the quantitative data that is required to assess six of the domains is collected by different institutions at the local and international level. At the local level, the SAMRC provides estimates of the burden of disease in South Africa. The data is, however, based mainly on modelled estimates, often combining different sources which may underestimate the prevalence of diseases. Furthermore, estimates are often aggregated and not stratified by age and sex, limiting their usefulness in assessment of disease-specific interventions. This is specifically important when burden-of-disease data is required in prioritisation of the most prevalent conditions and when estimating affordability of interventions. Reliance on this data may therefore introduce bias in HTA processes which may misinform the allocation of limited resources. In the absence of primary data, however, triangulation with other sources and sensitivity analyses are recommended.

The national surveys (SADHS, GHS) conducted by Stats SA were also identified as a source of data for prevalence of disease. While the SADHS provides best available data due to the use of biomarkers to test disease, the survey is conducted every 7 years, limiting the usefulness of such data in estimating current disease prevalence. For GHS, self-reporting of disease was identified as a limitation which may underestimate prevalence. The survey was, however, identified as useful as it is nationally representative and data is collected annually. Data from this survey is also accessible and has been used to conduct research on the cost of hypertension [20] and obesity [21] in South Africa.

At the international level, the IHME provides estimates of prevalence, incidence, mortality, and DALYs. The IHME estimates are, however, based on modelling rather than observed data which reduces their reliability for context-specific decision making. The use of such data will require triangulation with nationally representative surveys and local studies to improve validity of HTA studies. The disability-adjusted weights generated were identified as useful for conducting HTA as evidenced by local studies that have used the data to conduct cost-utility analysis [22]. Another source of data identified was the WHO-GHO, which provides data on the prevalence and incidence of some diseases. The lack of consistency and transparency in terms of how prevalence is derived was identified as a limitation for use in HTA.

For clinical effectiveness measures, systematic reviews and RCTs from research publication sites such as PubMed, Cochrane and ClinicalTrials.org were identified as reliable sources for different interventions. In the absence of local data, systematic reviews and RCTs are a gold standard for effectiveness measures due to the reliability of the data collection processes. Local economic evaluation studies have used such studies as a source of effectiveness data. For outcome measures, we identified academic literature, IHME and EuroQol as sources of data for utilities, disability weights, and utility weights. These data sources have been used to estimate cost-utility studies on pregnancy grants [22], end-stage kidney disease [23], and diabetes [24] in South Africa.

For the costing data, UPFS, MHPL, MPR, and WHO-CHOICE were identified as sources of data for conducting cost of intervention analysis. The local sources are mostly published annually while the WHO-CHOICE was published in 2010, requiring adjustments for current years. The UPFS and MHPL contain standardised and transparent fee structures that have been used to estimate the cost of several conditions in South Africa [20, 21, 25, 26]. While international data can be useful in the absence of local evidence, reliance on such data may introduce bias and reduce the policy relevance of HTA findings. Locally derived data should therefore be prioritised over international data sources where available.

To estimate the impact of interventions on healthcare budgets, estimates of the size of the eligible population and patterns of health service utilisation are required. We identified the DHIS, GHS, and DHB as key sources for estimating the budget impact of interventions. The DHIS provides

detailed, facility-level data on service utilisation while the DHB synthesises these data to highlight geographic variation in service delivery. In a study conducted by Thabethe and Matthews in the Eastern Cape province, quality of the DHIS data was estimated at 84.9% while internal consistency was valued at 95.1%, demonstrating the high quality of the data [27]. The GHS was identified as a source of data for healthcare-seeking behaviour, access to services, and insurance status, which are critical for estimating unmet need. While these data can be useful, routine data systems such as the DHIS capture only individuals who access services and therefore underestimate the true eligible population. These limitations underscore the need for transparent handling of uncertainty and a triangulated approach to estimating population eligibility and utilisation.

To measure the impact of an intervention on equity, we identified GHS, NIDS, SADHS, IES, DHIS, and LCS as sources of baseline data for the distribution of health. Data from these surveys have been used in several studies in South Africa. Koch and Thsehla used the GHS to estimate the impact of diabetes on labour force participation [28]. In a study to evaluate the distributional impact of South Africa's health promotion levy, Saxena et al. [29] and Boachie et al. [30] used data from NIDS and the NDoH to estimate OOP payment, income per capita, and labour force participation rate by income quintile [28].

The SAVE-UHC domains, 'respect and dignity', 'impact on personal relationships', 'ease of suffering', 'impact on safety and security', and 'solidarity and social cohesion' had limited sources of data. The lack of data for these domains is not surprising as existing surveys and health information systems are designed to collect epidemiological, clinical and financial indicators. In the absence of routinely collected data, qualitative evidence and stakeholder input should be considered to complement the other domains. Such data can also be used in deliberative processes and inform multi-criteria decision analysis.

For the 'system factors and constraints' domain, which is a cross-cutting domain to ensure the delivery of health technologies, we identified routine inspections by the Office of Health Standards Compliance as sources of data. While these data sources provide baseline performance data on user rights, clinical support services, facilities and infrastructure, governance and human resources, the use of such data without complementary data may lead to overestimation of system readiness and feasibility. This is due to the fact that such data are collected for compliance rather than capacity and rely on categorical indicators that may oversimplify complex service delivery realities. We also identified the Human Resource Strategy for 2030 as a source of baseline assessment of human resource for health in South Africa [31]. The use of the estimates should, however, be interpreted within context as the estimates may not fully capture dynamic workforce availability, productivity, or distributional inequities at provincial and district levels. It will be critical that data from this source be triangulated with other sources to ensure no bias in the estimation of available resources [14, 26, 32].

Access to some of the data identified also requires permission. While surveys such as GHS, SADHS, NIDS, and LCS generate valuable data, access is constrained by centralised ownership. As a result, researchers may face significant delays and gaps in accessing timely datasets, undermining the ability to conduct research.

4.1 Policy Implications

NHI implementation in South Africa relies on the assessment of health technologies to ensure that services that are adopted meet a set of predetermined criteria. The data challenges faced by South Africa are not unique. A systematic review by Suharlim et al. found that lack of local data was the most frequently cited barrier to HTA implementation [33]. In Southeast Asia, gaps in local health and economic data remains a major challenge [34], with Vietnam citing the lack of local data as a key constraint in conducting HTA [35]. Even though countries such as Thailand and the Philippines face similar challenges, this has not deterred them from conducting HTA. In Thailand, the institutionalisation of HTA and the adoption of transparent, iterative, and methodologically robust approaches that incorporate multiple data sources, expert input, and explicit handling of uncertainty have helped build trust in the use of HTA to support evidence-informed decision making. The experience of Thailand highlights that the absence of perfect data should not serve as a reason for delaying HTA. Rather, it highlights the need for HTA practitioners and policy makers to agree on the most appropriate data sources to ensure consistency and to manage uncertainty under imperfect information.

Regarding outcome measures, the lack of utility values for South Africa needs to be addressed. Current studies that conduct cost-utility research rely on utility values from other countries. According to Chootipongchaivat et al., HTA does not always require locally generated data for all parameters, as evidence from similar settings can be used where appropriate [36]. For instance, countries such as Indonesia and Vietnam have borrowed utility values from Thailand to support economic evaluations. While it is currently recommended that researchers adopt utility values of countries similar to their own, such values should be adopted with caution as they may not reflect South African population preferences. For example, in Africa, the closest country that has utility values is Zimbabwe, with values that were generated in the year 2000. It is imperative therefore that the country derives its own utility values that reflect the population's own values. Lessons can be learned from Thailand, where

the Health Intervention and Technology Program (HITAP) has conducted research to generate value sets based on societal preferences of the Thai population. Policymakers in South Africa would need to support research to generate these value sets for South Africa [37].

South Africa, through Stats SA, conducts various surveys that capture data at the individual level. It will be important for policymakers to make the most out of these surveys and incorporate additional data that might be needed to operationalise HTA. In addition, an HTA body would need to be equipped to conduct additional surveys to collect health technology-specific data that would not be suitable to collect through the routine surveys. For the system factors and constraints data, it would be useful for the OHSC to have an online monitoring system with data that is publicly available to inform research. To address persistent barriers to data use, South Africa should establish a centralised data repository or data access platform with linkages to other platforms. In Thailand, HITAP developed the Thai national database for HTA, and a standard cost list for HTA [38].

For policymakers, it is important to note that even though there might be some gaps, the current data can be used to conduct HTA. As with other research, there will always be uncertainty when using data that is sometimes not generated specifically for the research in question. To address such uncertainties, researchers have come up with ways to conduct sensitivity analyses to vary input data and to test the robustness of models for evaluating interventions. It is important, therefore, that adoption of HTA not be delayed due to perceived data challenges.

4.2 Strengths and Limitations

The lack of data has been cited as a hinderance for conducting economic evaluations and HTA in South Africa and the rest of the African continent. According to our knowledge, this is the first study to assess the availability of data for HTA in South Africa. Our study points policymakers and researchers to relevant data sources that could be used in HTA, not only in South Africa but in other countries also as some of the data sources identified capture data for multiple countries. We have, however, noted some limitations with our targeted review. We did not assess the quality of the data sources; however, we have referenced some literature that used some of the data sources that we identified.

5 Conclusion

A wide range of data sources are available to inform health technology assessment in South Africa. However, the data sources available only measure some of the value elements in the SAVE-UHC framework. As the country embarks on institutionalising HTA, it will be critical for policymakers to develop a strategy to address data gaps to ensure that healthcare decisions are made using relevant and recent evidence. Such a strategy should be balanced against new data collection, strengthening existing data systems and improving their usability for HTA to ensure sustainability and value for money. Parallel to this should be an investment in a modern, integrated health data infrastructure that improves accessibility while maintaining security and compliance.

Existing challenges should however not deter South Africa from institutionalising HTA. Experiences from other countries suggest that HTA can proceed under conditions of imperfect data, provided that uncertainty is explicitly managed. Standardised methods for data triangulation and the use of imperfect evidence should therefore be in place to manage this constraint.

Advancing HTA in South Africa will therefore depend on strengthening existing data collection platforms and improving their usability for HTA, investments in new data collection, and standardising methods for dealing with imperfect information. This approach will require the participation of different stakeholders such as policymakers, researchers, as well as patients.

Declarations

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Ethics Approval The review was based on publicly available evidence. An ethical waiver from the University of Witwatersrand's Human Research Ethics Committee (Non-Medical) was granted.

Consent to Participate Not applicable.

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Conflict of Interest The authors declare no competing interests.

Code Availability Not applicable.

Data Availability The study uses publicly available data sourced from the references cited in the paper.

Authors' Contributions Thsehla conceived the research. Thsehla and Holden developed the study protocol and methodologies. Thsehla, Holden, Boachie and Goldstein collected and analysed the data. Thsehla and Holden drafted the manuscript. Boachie and Goldstein reviewed the manuscript.

References

1. South African National Department of Health. "National Health Insurance." Pretoria: National Department of Health; 2025. Available from: https://www.health.gov.za/nhi/
2. South African Government. National Health Insurance Act No. 20 of 2023. Cape Town: Parliament, 2024.
3. Hailey D. Health technology assessment. Singapore Med J.2006;47(3).
4. Drummond MF, et al. Key principles for the improved conduct of health technology assessments for resource allocation decisions. Int J Technol Assess Health Care. 2008;24(3):244–58. https://doi.org/10.1017/S0266462308080343.
5. Leelahavarong P, et al. Health Technology Assessment in Thailand: institutionalization and contribution to healthcare decision making: review of literature. Int J Technol Assess Health Care. 2019;35(6):467–73. https://doi.org/10.1017/S0266462319000321.
6. Banta D, Jonsson E. History of HTA: introduction. Int J Technol Assess Health Care. 2009;25(S1):1–6. https://doi.org/10.1017/S0266462309090321.
7. Maynou L, Cairns J. What is driving HTA decision-making? Evidence from cancer drug reimbursement decisions from 6 European countries. Health Policy. 2019;123(2):130–9. https://doi.org/10.1016/j.healthpol.2018.11.003.
8. Noorani HZ, Husereau DR, Boudreau R, Skidmore B. Priority setting for health technology assessments: a systematic review of current practical approaches. Int J Technol Assess Health Care. 2007;23(3):310–5. https://doi.org/10.1017/S026646230707050X.
9. Betts MB, et al. Comparison of recommendations and use of cardiovascular risk equations by health technology assessment agencies and clinical guidelines. Value Health. 2019;22(2):210–9. https://doi.org/10.1016/j.jval.2018.08.003.
10. Callea G, Armeni P, Marsilio M, Jommi C, Tarricone R. The impact of HTA and procurement practices on the selection and prices of medical devices. Soc Sci Med. 2017;174:89–95. https://doi.org/10.1016/j.socscimed.2016.11.038.
11. Hollingworth S, Fenny AP, Yu S-Y, Ruiz F, Chalkidou K. Health technology assessment in sub-Saharan Africa: a descriptive analysis and narrative synthesis. Cost Eff Resour Alloc. 2021;19(1):39. https://doi.org/10.1186/s12962-021-00293-5.
12. Hollingworth S, et al. Implementing health technology assessment in Ghana to support universal health coverage: building relationships that focus on people, policy, and process. Int J Technol Assess Health Care. 2020;36(1):8–11. https://doi.org/10.1017/S0266462319000795.
13. Jugathpal J, Parrish A, Jamaloodien K, Blecher M, Daven J. Institutionalizing Health Technology Assessment in South Africa—An Opportunity in National Health Insurance. Health Syst Reform. 2023. https://doi.org/10.1080/23288604.2024.2327098.
14. Hollingworth SA, et al. What do we need to know? Data sources to support evidence-based decisions using health technology assessment in Ghana. Health Res Policy Syst. 2020;18(1):41. https://doi.org/10.1186/s12961-020-00550-8.
15. Mbau R, Vassall A, Gilson L, Barasa E. Factors influencing institutionalization of health technology assessment in Kenya. BMC Health Serv Res. 2023;23(1):681. https://doi.org/10.1186/s12913-023-09673-4.
16. Kairu A, Barasa E and Oyalo P. Around the world in HTAs: Kenya – riding the waves of change. Office of Health Economics
17. Blaauw D, et al. Introducing an Ethics Framework for health priority-setting in South Africa on the path to universal health coverage. S Afr Med J. 2022;112(3):240–4. https://doi.org/10.7196/samj.2022.v112i3.16278.
18. Murphy P, Holden C, Qian Y, Walker S, Thsehla E, Griffin S. Reflecting social values in HTA methods: a case study of South Africa. Appl Health Econ Health Policy. 2025. https://doi.org/10.1007/s40258-025-00990-9.
19. StatsSA. Mortality and causes of death in South Africa, 2016: findings from death notification," Pretoria, 2018. Available: http://www.statssa.gov.za/publications/P03093/P030932016.pdf
20. Kohli-Lynch CN, Erzse A, Rayner BL, Hofman KJ. Hypertension in the South African public healthcare system: a cost-of-illness and burden of disease study. BMJ Open. 2022;12(2):e055621. https://doi.org/10.1136/bmjopen-2021-055621.
21. Boachie MK, Thsehla E, Immurana M, Kohli-Lynch C, Hofman KJ. Estimating the healthcare cost of overweight and obesity in South Africa. Glob Health Action. 2022. https://doi.org/10.1080/16549716.2022.2045092.
22. Moolla A, et al. A cost-effectiveness analysis of a South African pregnancy support grant. PLOS Global Public Health. 2024;4(2):e0002781. https://doi.org/10.1371/journal.pgph.0002781.
23. Thsehla E, Boachie MK, Goldstein S. Cost-effectiveness and budget impact analysis of peritoneal dialysis and haemodialysis in South Africa. BMC Health Serv Res. 2025;25(1):100. https://doi.org/10.1186/s12913-025-12227-5.
24. Fraser HL, et al. Extended cost-effectiveness analysis of interventions to improve uptake of diabetes services in South Africa. Health Policy Plan. 2024;39(3):253–67. https://doi.org/10.1093/heapol/czae001.
25. Erzse A, Stacey N, Chola L, Tugendhaft A, Freeman M, Hofman K. The direct medical cost of type 2 diabetes mellitus in South Africa: a cost of illness study. Glob Health Action. 2019. https://doi.org/10.1080/16549716.2019.1636611.
26. Matsela LM, Cleary S, Wilkinson T. Cost utility and budget impact analysis of dexamethasone compared with bortezomib and lenalidomide for the treatment of second line multiple myeloma from a South African public health perspective. Cost Effectiveness Resour Allocation. 2022;20(1):69. https://doi.org/10.1186/s12962-022-00399-4.
27. Thabethe SS, Mathews VE. Quality of routine health data in DHIS2 in South Africa: Eastern Cape province from 2017–2020. S Afr J Inf Manag. 2024. https://doi.org/10.4102/sajim.v26i1.1903.
28. Koch SF, Thsehla E. The impact of diabetes on labour market outcomes. Dev South Afr. 2022;39(3):424–56. https://doi.org/10.1080/0376835X.2021.2015291.
29. Saxena A, Stacey N, Puech PDR, Mudara C, Hofman K, Verguet S. The distributional impact of taxing sugar-sweetened beverages: findings from an extended cost-effectiveness analysis in South Africa. BMJ Glob Health. 2019. https://doi.org/10.1136/bmjgh-2018-001317.
30. Boachie MK, Hofman K, Goldstein S, Thsehla E. Modelling the potential impact of a tax on fruit juice in South Africa: implications for the primary prevention of type 2 diabetes and health financing. BMC Nutr. 2024;10(1):145. https://doi.org/10.1186/s40795-024-00941-y.

31. National Department of Health. 2030 Human Resources for Health Strategy: investing in the health workforce for Universal Health Coverage. Pretoria, 2020.
32. Pillay-van Wyk V, et al. Can non-fatal burden estimates from the Global Burden of Disease study be used locally? An investigation using models of stroke and diabetes for South Africa. Glob Health Action. 2021. https://doi.org/10.1080/16549716.2020.1856471.
33. Suharlim C, et al. Exploring facilitators and barriers to introducing health technology assessment: a systematic review. Int J Technol Assess Health Care. 2022;38(1):e5. https://doi.org/10.1017/S0266462321000623.
34. Association of Southeast Asian Nations (ASEAN). SEAN follow-up assessment on the current status of health technology assessment (HTA) institutionalization and capacity needs of ASEAN Member States. Jakarta. 2021.
35. Mundy L, Maddern G. HTA capacity building in Asia: towards one goal. Int J Technol Assess Health Care. 2023;39(1):e56. https://doi.org/10.1017/S0266462323000405.
36. Chootipongchaivat S, Tritasavit N, Luz A, Teerawattananon Y and Tantivess S. Conducive factors to the development of health technology assessment in Asia. Nonthaburi, 2016.
37. Pattanaphesaj J, Thavorncharoensap M, Ramos-Goñi JM, Tongsiri S, Ingsrisawang L, Teerawattananon Y. The EQ-5D-5L valuation study in Thailand. Expert Rev Pharmacoecon Outcomes Res. 2018;18(5):551–8. https://doi.org/10.1080/14737167.2018.1494574.
38. Tanvejsilp P, Taychakhoonavudh S, Chaikledkaew U, Chaiyakunapruk N, Ngorsuraches S. Revisiting roles of health technology assessment on drug policy in universal health coverage in Thailand: where are we? And what is next? Value Health Regional Issues. 2019;18:78–82. https://doi.org/10.1016/j.vhri.2018.11.004.