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The national health insurance scheme in South Africa: A pre-implementation evaluation of systemic threats, financial affordability and stakeholders' sentiments

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DECLARATION

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DEDICATION

To my amazing wife, Lorraine, and wonderful son, Ariel Makomborero.

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Now to Him who is able to do exceedingly abundantly above all that we ask or think, according to the power that works in us, to Him be glory in the church by Christ Jesus to all generations, forever and ever, Amen (Ephesians 3:20-21).

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ABSTRACT

The impending national health insurance scheme is intended to provide all South Africans with access to high-quality, affordable services, regardless of socioeconomic status. However, there are concerns that the scheme may face various challenges, including gross systemic threats, cost-revenue imbalances and antagonistic stakeholder sentiments, thus undermining its benefits. In this study, a range of pre-implementation evaluation methods were used to assess the scheme. This includes systematic document reviews to identify systemic threats, analyses of projected costs and revenues using nonparametric and Monte Carlo techniques to assess the affordability of the scheme, and the use of the Stanford CoreNLP natural language processing to evaluate stakeholders' sentiments towards the scheme.

The findings indicate that the scheme may fail if introduced on a derelict foundation due to administrative, resources and structural inadequacies. These challenges were further exposed during the current Covid-19 pandemic, emphasizing the threat they pose to the scheme. In terms of affordability, the analysis suggests that the scheme may be unaffordable due to the failure to raise sufficient revenues to fund the expected expenditure while keeping costs in line with the fiscal purse. From the examination of stakeholder sentiments towards the scheme, findings suggests that there is support for the scheme proposal but concerns regarding its operational and technical aspects are leading to negative sentiment against the scheme. The handling of the pandemic has also entrenched these negative sentiments against the scheme.

These findings have several policy implications. First, there is a need to reform the healthcare system to avoid introducing the scheme on a weak foundation. Secondly, to ensure affordability of the scheme, the government may need to scale down the scheme and focus on primary care and less comprehensive benefit packages. Effort should be made to align expenditure with available resources. Finally, improved communication and stakeholder engagement may improve sentiments towards the scheme and identify problem areas within the implementation framework. The use of a natural language processing technique, which is a novel approach to studying stakeholder sentiments in healthcare, constitute this study’s contribution to the literature of policy development and implementation.

Keywords: insurance; systemic threats; affordability; stakeholder sentiments; South Africa

LIST OF COMMON ACRONYMS

ADB	- African Development Bank
BRICS	- Brazil, Russia, India, China, South Africa
CASP	- Critical Appraisal Skills Programme
CASP	- Critical Appraisal Skills Programme
CI	- Confidence Interval
CIT	- Corporate Income Tax
CMS	- Council for Medical Schemes
DHB	- District Health Boards
GDP	- Gross domestic product
GEMS	- Government Employees' Medical Scheme
NDoH	- National Department of Health
NEHAWU	- National Education, Health and Allied Workers' Union
NHI	- National Health Insurance
NLP	- Natural Language Processing
OECD	- Organisation for Economic Cooperation and Development
PIC	- Patient, Intervention, Comparison
PICO	- Patient, Intervention, Comparison, Outcome
PIT	- Personal Income Tax
PMG	- Parliamentary Monitoring Group
SARS	- Severe Acute Respiratory Syndrome

SARS	- South African Revenue Services
SHI	- Social Health Insurance
SPICE	- Setting, Perspective, Intervention, Comparison, Evaluation
SPIDER	- Sample, Phenomenon of Interest, Design, Evaluation, Research Type
STATS SA	- Statistics South Africa
STC	- Secondary Tax on Companies
UHC	- Universal Health Coverage
UK	- United Kingdom
USA	- United States of America
VAT	- Value-Added Tax
WHO	- World Health Organisation
WISN	- Workload Indicators for Staffing Needs

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CHAPTER 1: INTRODUCTION

1.1 Background of the study

Globally, both developed and developing countries have employed national health insurance (NHI) schemes as organisational mechanisms for raising and pooling funds to finance health services (World Health Organisation (WHO), 2021). While NHIs are generally seen as vehicles for achieving universal healthcare by reforming how healthcare is financed, they have significant implications on many other healthcare system aspects such as system organisation and administration, regulation and governance, resources and infrastructure distribution, equity and equality (Fenny *et al*., 2018). These schemes have garnered significant popularity as nations face considerable healthcare challenges due to dwindling resources. As was the case in other countries, the purpose of South Africa's assemblage of reforms under the NHI sought to resolve the inequitable health system (Shisana *et al*., 2006; McIntyre *et al*., 2009).

The challenges in the South African healthcare system have been building up since the apartheid-era policies were in place (Kautzky and Tollman, 2008; Maillacheruvu and McDuff, 2014). During apartheid, most non-white South Africans had no access to proper healthcare due to concerted efforts to use its provision to achieve separate development across races. Thus, healthcare provision remained skewed in favour of whites and a small group of elites from other races, while the non-whites experienced disproportionately poor access to health outcomes (Coovadia *et al*., 2009; Horwitz, 2009). As apartheid continued, so did the inequality and inequity in access to healthcare. Expectedly, the disease burden also varied along the same racial and socioeconomic lines, leading to different health outcomes across demographic groups, an element that appears in the epidemiology of most diseases today (Eike et al., 2022).

Due to worsening socioeconomic circumstances and the transformation from an agrarian economy to mining, some non-whites were forced to move into informal settlements known as townships (Mears, 2011). Coercive legislation and land access restrictions were also used to achieve this migration (Coovadia *et al*., 2009). However, these townships were overcrowded and had inadequate sanitation and health facilities. Thus, the consolidation of racial segregation resulted in high disease prevalence in the townships (Van Rensburg and Benatar, 1993). Disease outbreaks such as tuberculosis and sexually-transmitted diseases were common in the townships (Packard, 1989; Karim et al., 2009). This disparity has perpetuated into the current two-tier system, where the government provides basic care in the public sector versus better-quality private healthcare with faster access for those who can afford it (Bust et al., 2023).

The end of apartheid came with high expectations, more so for healthcare provision due to promises of free healthcare by those at the forefront of campaigns for apartheid abolition. However, healthcare challenges persist (Pauw, 2022). For one, there was an acute increase in demand for healthcare, especially in public healthcare facilities, as people were no longer restricted from accessing such services (Coovadia et al., 2009). This increase in demand was coupled with the lack of resources and poor infrastructural management required to update the existing facilities to handle the soaring demand. Ballot (2021) also noted a lack of preventative maintenance, poor planning and a lack of solid governance as some of the significant contributors to the long and slow collapse of South Africa's top hospitals, such as the Charlotte Maxeke Johannesburg Academic Hospital.

It could be that inadequate attention has been paid to how resources are distributed in the healthcare system. In the two-tier setup, 20 percent of the population enjoys good private healthcare, while 80 percent relies on poor public care (Ngobeni *et al*., 2020). Of the total funds spent on healthcare, 50 percent goes to the private sector, while the other 50 percent goes to the grossly under-resourced public sector (Benatar *et al*., 2018). Further, the increasing cost of private healthcare means fewer people can afford it, and regressive out-of-pocket payments remain one of the most significant forms of healthcare financing (Ataguba, 2021). Thus, the unaffordability of healthcare has increasingly become commonplace amongst the population with medium to lower socioeconomic status (Ataguba and McIntyre, 2018; Ataguba, 2021).

The country has also been suffering from a cocktail of four colliding epidemics: maternal, newborn and child health, HIV/AIDS and Tuberculosis, non-communicable diseases, and violence and injury (Basu, 2018). South Africa has less than 1 percent of the world population but nearly 20 percent of the HIV-infected world population (World Population Review, 2023). Infant mortality rates are higher in South Africa than in countries such as Namibia and Botswana, which spend less on healthcare. Non-communicable diseases contribute 28 percent to the burden of diseases, while HIV/AIDS contribute 31 percent (WHO, 2020). The disease patterns in South Africa contradict trends in other countries where the burden has moved from communicable diseases to non-communicable ones (Kaluvu et al., 2022). Ndinda *et al*. (2018) ascribe this situation to the lack of health personnel, adequate facilities and equity in the distribution of resources.

The manifestation of most of these problems points out the poor progression in primary healthcare, an essential component of any healthcare system (Baum *et al*., 2017). Optimising how primary healthcare is structured and delivered has to be a key objective for policymakers who value the importance of sound healthcare systems. However, the South African health system performs dismally when primary healthcare aptness is measured in terms of first-contact accessibility and utilisation, ongoing comprehensiveness of care, family centredness and community orientation (Assegaai *et al*., 2018; Egbujie *et al*., 2018; Schneider *et al*., 2018). The South African system also performs poorly in issues such as using evidence-based care, geographical barriers to access, availability of professionally trained health personnel and limiting the number of patients requiring secondary and tertiary care (Bresick *et al*., 2019).

According to Mayosi and Benatar (2014), these problems reveal a confluence of the legacies of apartheid-era policies, the lack of political will towards remedying the issues and poor stewardship of the current system. They persist despite South Africa spending 8.5 percent of its GDP on healthcare (Ntuli and Letswalo, 2021), more than the 5 percent recommended by the WHO (Ottersen *et al*., 2017). So, this failure to translate funds into proper healthcare, the increased healthcare demand and worsening health outcomes mean that more comprehensive reforms are needed if UHC is ever to be achieved in South Africa. In investigating what those sweeping reforms would entail, various ministerial committees and commissions resolved that a national health financing scheme was necessary. Such a scheme would not only help generate additional revenue but also help reconfigure the whole system (NDoH, 2017).

In South Africa, there have been several attempts to introduce a health scheme with similar principles as in the past. For instance, the commission of old age pension and NHI (1928) called for establishing an insurance scheme for all the formal sector low-income employees in urban areas. The committee of enquiry into NHI (1935) made similar recommendations, and the Dr Henry Gluckman national health services commission (1942) suggested that healthcare be free at the point of service, funded through a national health tax (Brauns and Stanton, 2015; Maepa, 2020). Besides, the ANC demanded healthcare insurance in the African Claims Initiative in 1943 and the freedom charter in 1955 (van Niekerk, 2016). However, these attempts did not have political support, and some were deliberately reversed by the ruling National Party (Ataguba *et al*., 2011). Yet, they were paving the way for the now-gazetted insurance scheme.

A lot can be gathered from nations that successfully introduced different forms of NHIs. Such schemes have been hailed as mechanisms for optimising access to care without imposing financial risk on healthcare seekers (Brown, 2003). This increased access has come with lower costs and a significant reduction in the need for secondary and tertiary-level healthcare. In addition, primary healthcare and health promotion have been improved, and the distribution of resources across regions has become more equitable in these countries. Realising such benefits, as well as the achievements of other nations already under some form of an NHI, such as Britain and Germany, underline the varying designs of health schemes in both affluent countries such as South Korea, France, Canada and Thailand and less wealthy countries such as Nigeria and Ghana (McIntyre *et al*., 2003).

The improved healthcare systems in these countries after the successful implementation of their NHIs encouraged South Africa to implement its own. As currently conceived, the NHI will facilitate the provision of prepaid quality healthcare regardless of socioeconomic status (NDoH, 2019). The funds will be raised through progressive taxes based on the ability to pay to ensure financial risk protection for all households. The intention is to remedy the current system typified by high out-of-pocket payments, low household capacity to pay and a lack of prepayment mechanisms for risk pooling (Ataguba, 2021). Everyone will be required to belong to the health scheme, and the government will contribute for those who cannot. The aim is to achieve universal health coverage through comprehensive healthcare, free at the point of service in accredited healthcare facilities (Benatar, 2013).

Several economic theories and concepts – such as utility maximisation, market failure, and Pareto optimality – are often applied to evaluate the benefits NHIs bring to healthcare systems (Okunade and Karakus, 2017). For instance are seen as vehicles of utility maximization as they improve access to healthcare (Bhatia and Garg, 2018). This is accomplished by reducing the financial barriers that prevent individuals from obtaining medical care and providing them with financial protection against healthcare costs (Rovira and Costa-Font, 2012). Consequently, NHIs allow individuals to seek care when needed and avoid the adverse health effects of untreated illness or injury (Dor and Gertler, 2009). By ensuring that individuals receive the care they need to maintain their health and well-being, improved access to healthcare can enhance utility maximization (Smith and Mossialos, 2017).

NHIs have been shown to mitigate market failures in healthcare systems (Obermann and Jowett, 2018). One way NHIs can achieve this is by addressing information asymmetry. By pooling risk and spreading costs across a large population, NHIs can improve information flow and enable patients to make more informed decisions about their care (Kutzin et al., 2016).

Moreover, NHIs can address moral hazard – increase of healthcare utilization due to insulation from the costs of care – and adverse selection - where individuals with higher needs are more likely to purchase insurance than those with lower healthcare needs, leading to higher costs and premiums. NHIs can address this by implementing mechanisms such as co-payments, deductibles, risk-adjustment schemes, mandating participation and providing subsidies for low-income individuals (Cutler and Reber, 1998).

Finally, NHIs can promote Pareto optimality by improving the distribution of resources across subpopulations. NHI schemes provide universal coverage, thus promoting the efficient use of healthcare resources and preventing anyone from being worse off due to the scheme (Li et al., 2021). The schemes can also include redistributive mechanisms, such as subsidies or risk adjustment, further promoting Pareto optimality. However, recent studies have shown that successful implementation of NHI schemes requires a well-coordinated approach involving multiple stakeholders, including the government, healthcare providers, and the public (Onwujekwe and Uzochukwu, 2019). Countries such as Thailand and Ghana have implemented NHI schemes that have shown promising results in promoting Pareto optimality and improving access to healthcare (Asante et al., 2017).

Nevertheless, these schemes are not without their shortcomings, as has been seen and experienced in several countries. Chief among these shortcomings is the schemes' potentially negative impact on equity. In some cases, these schemes have been ineffective in improving equity, resulting in a waste of resources. In other cases, they have entrenched the inequity in healthcare altogether (Goudge *et al*., 2018; Saka and Fajemirokun, 2018). There are also concerns regarding sustainability due to design inadequacies that often typify these schemes (Alhassan *et al*., 2016; Barasa *et al*., 2018). These sustainability concerns are not limited to the poorer nations; even affluent countries such as Britain and Canada have started facing sustainability concerns due to growing and ageing populations and wage pressures (Ferry *et al*., 2017; Mossialos *et al*., 2018).

Challenges of inequity and unsustainability have the potential to materialise in the South African NHI. The high unemployment rate, particularly among the youth, and poor economic growth point towards future funding challenges (Blecher et al., 2017). The possibility of limited support from critical stakeholders, inadequate healthcare professionals at every level of the healthcare system, and weak administrative capacity may curtail the scheme's ability to translate funds into improved healthcare (Matsoso and Fryatt, 2013; Passchier, 2017). A study by Yende (2017) showed that for the scheme to run appropriately and efficiently, the country would have to triple its current number of doctors and nurses. However, given that the scheme is expected to be fully implemented by 2025, that target for increasing the number of healthcare personnel might be unfeasible.

The weak administrative capacity has been evident from the failure to control costs; over the past decade, specialist and hospital and health insurance costs have increased significantly above the consumer price index (Maphumulo and Bhengu, 2019). The system still operates using some apartheid-era policies. This is epitomised by the continued existence of a two-tier system that requires more robust control and coordination and a more curative and specialistic rather than comprehensive and preventative orientation (Moola, 2019; Musavengane and Leonard, 2019). The focus on specialised services is to the detriment of basic services as this may increase the disease burden. Such a setup will likely entrench existing inequities when funds start flowing in if the ensuing disease burden cannot be accommodated (Jeffery, 2016).

Affordability is another perceived threat to the NHI. Omarjee (2018) argues that the scheme lacks a realistic costing framework and a rule that links its spending to the available resources. There are also warnings that the expected cost of R256 billion is set at 2010 prices with a GDP growth rate of 3.5 percent. There could be a funding shortfall of R72 billion at that same 3.5 percent growth rate by 2025, rising to R108 billion if a growth rate of 2.0 percent is assumed (The Davis Tax Committee, 2017). Such elasticity is concerning. Solidarity Research Institute (2018) projects that the scheme will cost R369 billion by 2025, after which R156 billion will be needed annually. This means an additional tax of 5 percent of GDP will be required. Yet, the economic projections have become uncertain with the effects of covid-19.

The government intends to divert the private medical aid tax credit to the NHI (NDoH, 2017). However, unsubsidised medical aid will become unaffordable for most private healthcare users, leading to mass migration from the private to the public sector. This would leave the latter with millions more people to treat (Fourie, 2018). The lack of funds will worsen the pressure on the public sector (Serfontein, 2018). There is no sufficiently broad and progressive tax instrument to finance such a large public sector. The 38.3 percent of total revenue from the personal income tax base is very narrow, especially with unemployment rate increases. The 25.2 percent from value-added tax is regressive, and increasing the 16.6 percent corporate income tax base will affect job creation negatively (South African Revenue Service, 2019). Additionally, excise taxes cannot meet the shortfalls in funding (Serfontein, 2017).

The third issue relates to the stakeholders' expectations reflected in their sentiments towards the NHI. An effort has been made to communicate the scheme's motivation and explain the operational aspects of the healthcare reforms it will bring (Mayosi and Benatar, 2014). The supposed clear definition of the motivation behind the scheme and its technical elements was considered necessary to create acceptance from various stakeholders such as taxpayers and healthcare personnel (NDoH, 2017). The government needs the general population to buy into the idea of an NHI because a good percentage of that population will be required to contribute to the healthcare scheme fund. The government also needs public healthcare personnel to buy into the idea of the scheme because they need them in the NHI facilities, as do the private providers who will be contracted into the NHI (Gaqavu and Mash, 2019).

Nevertheless, there are mixed views regarding the NHI. On the one hand, the motivation behind the scheme seems to have generated some positive sentiment as most people recognise the need for reforms (Setswe *et al*., 2016; Mkhize, 2018). On the other hand, pessimism seems to surround the technical aspects of the scheme, specifically in terms of its affordability and administration. That is, there is concern that the scheme is not affordable and that the government cannot run it efficiently (Mkhize, 2018). Private healthcare sector professionals such as doctors also have no buy-in to the idea of an NHI due to the potential negative impact on the private sector and the related ills of working for the government (Booysen, 2017; Mabuza *et al*., 2018). As such, the sentiment towards the scheme may be negative enough to threaten its successful implementation even if its fundamentals are in place.

Overall, there are uncertainties regarding the implementation of the NHI in South Africa. It is uncertain whether systemic inadequacies are substantial enough to threaten its success and whether the provisions set in the scheme to deal with these threats are sufficient. There is also uncertainty surrounding the scheme's affordability stemming from two aspects – the ability of the government to raise enough revenues to fund the expected expenditure level and its ability to control costs – both of which depend profoundly on the government's administrative capacity. Finally, there is uncertainty regarding stakeholders' sentiments towards the scheme. The scheme's success depends on the support it will receive from various stakeholders, which hinges on their sentiments towards the scheme. Therefore, there is a need to investigate these issues before implementing the NHI in South Africa.

1.2 Overarching study problem statement

The already-gazetted NHI is expected to facilitate the realisation of UHC in South Africa (Fusheini and Eyles, 2016; NDoH, 2018). However, there are currently raging debates on whether the NHI will be successful. These debates relate to systemic threats such as inadequate government administration capacity, inequitable resources and infrastructure availability and distribution (Matsoso and Fryatt, 2013; Passchier, 2017). There are also doubts regarding affordability due to uncertainty about the ability to raise enough funds while controlling costs, especially given the economic outlook of the country (Maphumulo and Bhengu, 2019; Omarjee, 2018; Serfontein, 2018). Reservations regarding stakeholder sentiments towards the scheme, predominantly its technical and operational aspects, have also been expressed (Booysen, 2017; Mabuza et al., 2018; Mkhize, 2018).

Solving the issues around these debates require that a pre-implementation evaluation is conducted on these debated issues. The need for such an evaluation was heightened by the covid-19 pandemic that brought about significant distress to the global healthcare systems due to insufficient preparedness, global health system vulnerabilities and widespread transmission (Bollyky and Patrick, 2020; Cucinotta and Vanelli, 2020; Wang et al., 2020). Local unstable economic conditions and global economic risks that are now easily transmitted from one country to the other threaten tax revenues growth and the sufficiency and sustainability of funding for the scheme (Freeman et al., 2020; Morema and Bonga-Bonga, 2020). The concern is that introducing an infeasible scheme of the scale envisaged in the NHI may leave the healthcare system in a more dire state than it is currently.

1.3 Study objectives and research questions

This study aims to conduct a pre-implementation evaluation of the impending South African NHI regarding current healthcare systemic threats, financial affordability and stakeholders' sentiments. The study has developed four broad objectives which sought to answer a series of questions to achieve this aim, as follows:

1. To identify the valid threats to the South African NHI's successful implementation in the South African healthcare system. Specific questions to be answered by this objective are:
    - What are systemic threats to the South African NHI from published literature?
    - How do provisions in South Africa's NHI white paper deal with the identified threats?
    - What are the identified provisions' key weaknesses with respect to each debated threat?

2. To examine the extent to which the covid-19 pandemic exposed threats to the South African NHI and increase the possibility of its successful implementation. Specific questions to be answered by this objective are:
    - In what ways could the covid-19 pandemic have been managed better under the assumption of the South African NHI?
    - To what extent did the covid-19 pandemic highlight systemic threats to the South African NHI?
    - In what ways did the covid-19 pandemic increase the possibility of the South African NHI's success?
3. To determine South African NHI implementation affordability and sustainability based on projected costs and revenues. Specific questions to be answered by this objective are:
    - What are the projected costs of the South African NHI under certain assumptions?
    - What are the projected revenues of the South African NHI under certain assumptions?
    - To what extent is the South African NHI affordable based on revenue and cost projections?
4. To examine the sentiments of stakeholders towards the South African NHI and determine the extent to which they threaten its successful implementation. Specific questions to be answered by this objective are:
    - What are the stakeholders' sentiments towards the rationale and the operational aspects of the South African NHI?
    - To wat extent do the stakeholders' sentiments threaten the successful implementation of the South African NHI?
    - To what extent did the handling of covid-19 impact these stakeholder sentiments?

1.4 Importance and contribution of the study

Given the magnitude of reforms envisaged in this impending NHI, poor implementation of the scheme might result in a waste of many scarce resources without any improvement in healthcare provision. Failure may also go beyond the wastage of resources; some of the healthcare problems in the current system that the scheme seeks to solve may even be compounded. Consequently, health outcomes may worsen significantly, as would the trust in any subsequent policies the government may want to bring about. Therefore, further investigation to examine systemic inadequacies and threats to the scheme, its affordability and sustainability once it is implemented, and stakeholder sentiment is necessary to evaluate the proposed NHI before the implementation phase. Without such a study, the extent of these challenges may not be fully appreciated in policy formulation.

If the extent of the challenges is determined, this study will contribute to the NHI's success and the attainment of UHC in South Africa. Examining the systemic threats can reveal what needs to be adjusted in the NHI provisions and the healthcare system to ensure success. The consideration of projected revenues and costs is also pertinent because affordability is at the core of the NHI and the ability of the government to bring about reform in the provision of healthcare in the country sustainably. Finally, an ex-ante evaluation of stakeholders' sentiments towards the NHI is necessary to gauge the support and collaboration levels the government should expect in implementing the scheme. The sentiments of stakeholders can also help reveal some aspects of the scheme that may require some form of restructuring and rethinking.

1.5 Theoretical framework and methodological scope of the study

A theoretical framework that explains why specific research problems exist is usually used as a point of departure in most studies. This study examined three main aspects – systemic threats, fiscal affordability and stakeholder sentiment – each with its framework. The section briefly describes the theoretical framework and the methodological scope, the approach taken in addressing the study objectives and the research questions stated in Section 1.3.

1.5.1 Study theoretical framework

In this study, three distinct theoretical frameworks were employed. In examining the extent to which the NHI is under threat from the systemic inadequacies relating to its administration, resources and infrastructure and the two-tier setup (detailed in Chapter 2 and Chapter 3), the three-pillar framework of Kutzin (2008) was employed. The framework's first pillar is based on a set of objectives for health finance policy, grounded in the core values espoused by the World Health Organisation (2000). The second pillar consists of the organisation of national health financing systems based on describing the functions and policies associated with all health financing systems. Lastly, the third pillar recognises how key contextual factors limit the extent to which a country can sustain the achievement of policy objectives and may limit the range of policy options that can be considered (Kutzin, 2008).

The complex, adaptive theory was employed to examine the affordability of the NHI in Chapter 4. It was chosen based on the realisation that any policy relating to healthcare financing needs to be designed to optimise the raising of revenues, the pooling of funds and the purchasing of services. These activities occur in a complex, adaptive and relationship-reliant environment. The financing system does not act alone to achieve healthcare goals. Instead, coordination of policy and implementation across the health system functions is essential (Kutzin, 2008). Thus, all healthcare system functions' performance, including the financing thereof, should be evaluated based on the intermediate objectives set in the system. These intermediate objectives should be subject to overall healthcare systems goals. The complexity and dynamism involved in such evaluations speak of the complexity and dynamism of the system.

Finally, in examining healthcare system stakeholders' sentiments towards the NHI, as detailed in Chapter 5, the advocacy coalition framework of Sabatier (1988) and Sabatier and Jenkins-Smith (1991) was employed. The framework is based on the realisation that in public policy, there are coalitions that form due to particular interests. The advocacy coalition framework was designed especially for policy areas characterised by high goal conflict, high technical uncertainty about the nature and causes of the problem, and a large number of actors from multiple levels of government (Hoppe and Peterse, 1993; Cerna, 2013). This is consistent with the NHI, especially when private healthcare actors and some special interest groups are considered. Thus, the employment of this framework focused on actors and their collective interactions as NHI and the healthcare system stakeholders.

1.5.2 Study methodological scope

This study adopted various approaches. Systematic literature reviews were conducted in Chapter 2 and Chapter 3 to examine the systemic threats to the NHI and the case of covid-19. This approach was chosen based on its frequent use in healthcare policy research and the need to synthesise existing information in published documents. Further, the information required was primarily found in research articles and policy documents – the evidence from published articles and the documents with the provisions set in the NHI. Three separate searches were conducted on various sources to access the articles needed for the three aspects – administration and governance, resources availability and distribution and two-tier systems. An inclusion/exclusion criterion was applied to the yielded documents from the search, and the Critical Appraisal Skills Programme (CASP) tool was used to ensure quality.

To examine the affordability of the NHI, a nonparametric comparative analysis and the Monte Carlo simulation approaches were employed in Chapter 4. The methodology choice was constrained by the lack of historical data on which to base the projections and by the dynamism in the factors that determine affordability. Both approaches relied on various assumptions regarding coverage costs, total revenues and the respective growth rates. The nonparametric approach considered historical proportions between healthcare revenues and costs in determining whether it would be feasible to raise enough funding to support the new level of expenditure in the first NHI year. In the Monte Carlo approach, simulations were run on costs, revenues and the difference to statistically determine the scheme's affordability over a more protracted period than just the first year of full implementation.

Finally, a qualitative approach using the Java-based Stanford CoreNLP natural language processing toolkit was followed to examine stakeholders' sentiments in Chapter 5. Text from news articles was used because the articles are a good source of information where attitudes and sentiments are expressed. Adopting this methodology was an alternative to surveying participants, which was not feasible in the context of covid-19. News articles also shape the attitudes and sentiments of readers (Shapiro *et al*., 2020). Accordingly, limiting the focus to the period following the publication of the white paper on the NHI, articles written on the scheme were searched for, and an inclusion/exclusion criterion was applied to select the relevant articles. Subsequently, using the architecture proposed by Zhang *et al*. (2009), the polarity determination of each sentence and the full articles was conducted.

1.6 Structure of the study

This study is structured as follows: Chapter 1 contains the background of the study. Chapter 2 is set to achieve the first objective of identifying the valid threats to the NHI's successful implementation in South Africa by reviewing published literature, examining the provisions in the NHI white paper, and determining what these provisions' key weaknesses with respect to each debated threat are. Chapter 3 examines the extent to which the covid-19 pandemic exposed threats to the NHI and increased the possibility of its successful implementation based on the second broad objective. This is achieved by determining whether the covid-19 pandemic could have been managed better under the NHI, the extent to which the pandemic highlighted systemic threats to the NHI and how it increased the possibility of NHI success.

Chapter 4 aims to determine the NHI's affordability and sustainability based on projected costs and revenues according to the third objective by projecting NHI coverage costs and revenues under certain assumptions and comparing the two. Chapter 5 is set to achieve the fourth objective of examining the sentiments of stakeholders towards the NHI and the extent to which they threaten its successful implementation. This is achieved by determining the stakeholders' sentiments towards the rationale and operational aspects of the NHI and the extent to which the handling of the covid-19 pandemic impacted them. Chapter 6 summarises and concludes the study. Of note, except for the introduction and conclusion, each chapter contains separate literature and analysis in line with the objectives and questions under each objective.

1.7 Limitations of the study

The focus was only on the South African NHI, drawing most details necessary for the evaluation from the white paper (2017). However, some of the provisions are subject to change as time goes on. Secondly, as an ex-ante evaluation, the study had to rely on certain assumptions. This was especially so in estimating revenues and costs in the affordability evaluation. These assumptions made, while plausible, may not be perfectly valid. Nevertheless, they were necessary and assisted in reaching practical and relevant conclusions.

1.8 Chapter summary

In sum, there are concerns that the current context of the South African health system may prevail post-NHI implementation. This chapter provided a background to the NHI, described the problem statement and showed the need for its pre-implementation evaluation to inform policymakers. Subsequently, the contribution, the scope and the structure of the study were laid out. The next chapter presents an analysis of the systemic threats to the NHI.

CHAPTER 2: A PRE-IMPLEMENTATION EVALUATION OF THE SYSTEMIC THREATS AGAINST THE NATIONAL HEALTH INSURANCE SCHEME

2.1 Introduction to the examination of systemic threats to the South African NHI

As noted in Chapter 1, there are various systemic aspects that can adversely affect the ability of NHIs to translate additional finances into better quality healthcare. However, if NHIs are correctly structured and provisions well thought out, they may succeed in bringing about the necessary reform in healthcare systems. Accordingly, this chapter sought to identify threats to the South African NHI's successful implementation from published literature. Subsequently, the chapter sought to evaluate the provisions in the NHI white paper regarding how the NHI is supposed to deal with the threats and to identify any critical weaknesses of the provisions concerning each debated threat. Findings in this regard are policy-relevant in ensuring that the scheme is successfully implemented.

This chapter is organised as follows. Section 2.1 provides a background to the chapter, focusing on the systemic threats to the South African NHI as noted in the literature. Section 2.2 presents a conceptual and theoretical framework employed in this chapter. The same section also provides a literature review on the threats. Section 2.3 describes the literature search strategy and the selected studies' quality appraisal and analytical procedure. Section 2.4 reviews the international evidence, mainly focusing on the same threats identified in Sections 2.1 and 2.2. Section 2.5 presents a description of relevant NHI provisions in the white paper (2017), and Section 2.6 contains an analysis of the NHI provisions' sufficiency in dealing with the identified threats. Finally, Section 2.7 concludes the chapter.

2.1.1 Systemic threats to the South African NHI

As noted in Chapter 1, health financing reform can positively change the whole system (Ong *et al*., 2018; Yardim and Under, 2018). Aspects such as resource sufficiency and distribution, information and monitoring systems, human resources capacity and subsidies for those with low ability to pay can be improved (Balabanova *et al*., 2013). Thus, any financing reforms must be meticulously implemented to ensure success. Otherwise, poorly implemented financing reforms can be catastrophic to the healthcare system. Failure may even worsen any problems in the system (Buletsa and Deshko, 2018). For instance, poorly implemented financing reforms may further entrench the problem of inequity if it is one of the pre-existing challenges in the system. Therefore, there is always a risk of introducing more challenges or inadequacies in the healthcare system when reforms are implemented.

The impending South African scheme is not immune. Concerns about the current systemic issues threatening the scheme have been raised (Michel *et al*., 2020). These include, among others, the government's lack of administrative capacity (Matsoso and Fryatt, 2012; Rispel, 2016; Masuku, 2019; Maphumulo and Bhengu, 2019), the unavailability and poor distribution of resources and infrastructure (Surrender *et al*., 2016; Passchier, 2017; Omarjee, 2018), and the two-tier system setup (Rusch *et al*., 2012; Sekhejane, 2013; Passchier, 2017; Blecher *et al*., 2019). These concerns can be linked to the enormity of the scheme and its significant implications for how healthcare will be structured, financed and delivered in the country. Thus, the importance of competent administration, sufficiency of resources and infrastructure and appropriate system structure cannot be overemphasised.

Countries such as Thailand, Singapore and Taiwan that have successfully implemented schemes of a similar nature had superior administrative structures with satisfactory control of their healthcare systems (Gertler, 1998; Pannarunothai *et al*., 2004; Sidorenko and Butler, 2007). In South Africa, however, the government has a poor record in running parastatals (Inglesi-Lotz, 2019; Hofstatter and House, 2019; Lawrence, 2020). Most of these institutions are beset with critical problems such as unaffordable debt levels, unsustainable operating losses and large-scale corruption that are symptoms of the administrative incapability of the government and have constantly needed government bailouts to avoid collapse (Budhram, 2019; Hofstatter and House, 2019; Masuku, 2019; Bowman, 2020). Thus, there is a strong expectation that the same issues will plague the scheme as the largest parastatal in the country.

The health department has also exhibited incapability in coping with the current health system issues. So, the department may perform worse in a more complex NHI (Malakoane *et al*., 2020). Notably, healthcare administration has worsened since the end of apartheid in 1994 (Maphumulo and Bhengu, 2019). To expect any change in administrative capacity before the national rollout of the scheme expected in 2025 seems impractical. Even though the scheme promises radical change in healthcare administration and management purposefully aimed at eliminating duplication of administrative processes, such cannot be guaranteed. The disparities across districts in health profiles, service delivery performance, district management capacity, social determinants of health, compliance with quality standards and the burden of disease can complicate the process (Fusheini and Eyles, 2016).

Further concerns have been raised based on the unavailability and poor distribution of financial and human resources. Despite a planned progressive rollout of the scheme, a demand shock without a match in terms of the critical sources of funds can be catastrophic to the healthcare system (Rangasamy, 2021). The magnitude of current healthcare inadequacies – the gross inequities and inequalities – means that health-seeking behaviour will change considerably. However, the envisioned scheme lacks a realistic framework consistent with the fiscal and human resource envelope and a rule that links the projected spending to the available resources (Omarjee, 2018). With poorly checked demand due to a lack of robust control mechanisms for the usage of healthcare services – a likely result of inadequate administrative capacity – the NHI might become unsustainable due to the pressure on resources.

The expected demand-resource mismatch extends to infrastructure, which remains under pressure due to the lack of maintenance and improvement. This is in line with Rusch *et al*. (2012) and Surrender *et al*. (2016), who described the current infrastructure as inferior and unfit for large-scale reforms. The Parliament's Portfolio Committee on Health also noted infrastructural problems in major institutions such as Tembisa hospital, which services three metros – Tshwane, Johannesburg and Ekurhuleni (Ngqakamba, 2021). Ward *et al*. (2014) also noted a lower growth rate in community pharmacies relative to the population growth rate and were eight times more in urban areas than in the most deprived districts. Passchier (2017) reported that the inequitable resource and infrastructure distribution means that the NHI's capacity will vary between provinces, which would, in turn, entrench the equity gap.

The challenges relating to administration, resources, and infrastructure may be worsened by the existence of a two-tier healthcare system in South Africa (Setswe *et al*., 2016). This split between the public sector and a mutually reinforcing ecosystem of private health insurers, private hospitals and specialists in the healthcare system is highly inequitable. As alluded to before, the private sector serves less than a quarter of the population while absorbing almost half of the country's healthcare expenditure (Comparative Health Policy Library, 2022). After years of consolidation among private hospital groups and insurance schemes and successive failures at establishing credible price benchmarks, South Africa's private hospitals charge comparable prices to considerably richer countries. This compromises the affordability of a broad-based expansion in healthcare for the population (Barber *et al*., 2018).

The unsustainability of financing in the country explains why the government seeks to collapse the public and private systems into a single fund to reduce the fragmentation and inequities inherent in the system (Goudge *et al*., 2018). This will also see the government withdrawing the tax subsidies for medical scheme contributions used by the wealthier households in private care (Marten *et al*., 2014). The tax subsidies consist of subtracting medical contributions from taxes owed to the government (Ataguba and McIntyre, 2018). However, the concern is that as the NHI is progressively implemented, the vast discrepancies between the public and private sectors will continue to reinforce unfair, avoidable discrepancies in access to services and health outcomes (Maseko and Harris, 2018). This would undermine the efforts to achieve universal health coverage through the NHI by threatening its sustainability.

Further, the private sector strongly opposes the planned single-payer system and the government as overtly political with the intention of destroying the well-functioning private healthcare system (Matthew and Mash, 2019). They view the government as increasingly becoming antagonistic to the private sector, shifting the blame for their inability to run the healthcare system to the private sector (Booysen and Hongoro, 2018). Many private sector stakeholders have also noted that the NHI developers have done extraordinarily little more than outline the enabling legislation for a new state-owned enterprise. Accordingly, due to these negative perceptions, the scheme will likely face a barrage of legal challenges and a lack of cooperation from the private sector providers (Michel *et al*., 2020). Yet, strong buy-in from these actors is requisite if the scheme is to be successfully implemented.

Overall, as currently envisaged, the NHI may be subject to various systemic threats to its successful implementation. There is, therefore, a need to identify these threats and their validity, given specific provisions in the white paper (2017). This is because, if valid, these systemic threats may impede the scheme from changing the status quo in the South African healthcare system (Michel *et al*., 2020). Even worse, depending on the magnitude of the threats, the healthcare system might end up in a graver state than it is currently. These threats also increase the possibility that some aspects of the proposed NHI will not work according to the prediction of theories on healthcare financing reform, convention and practice as experienced in other countries. This compounds the complexity of planning and policy design and increases the reliance on assumptions.

2.1.2 Statement of the problem on the systemic threats to the NHI

NHIs are often seen essential vehicles towards achieving UHC (Bazyar *et al*., 2021). However, the proposed South African NHI faces significant threats to its successful implementation, mainly due to inadequacies in government administrative capacity, resources and infrastructure and the two-tier financing system. These threats are unlikely to be dealt with by the deadline for NHI implementation in 2025, which could result in the NHI worsening some of the challenges in the healthcare system. While the government is going ahead with the scheme's implementation, having made provisions to deal with these threats to the NHI's successful implementation, it is essential to carry out the pre-implementation evaluation to advise the policy process. The need for such an evaluation is spurred on by the absence of studies that have attempted such preimplementation evaluations of the proposed scheme despite their apparent need.

2.1.3 Chapter's aim and objectives regarding systemic threats to the NHI

As noted in Chapter 1, this chapter aimed to identify the valid threats to the South African NHI's successful implementation in the South African healthcare system. The specific objectives based on the questions specified in Chapter 1 are:

- to identify the systemic threats to the South African NHI from published literature;
- to determine how provisions in the South African NHI white paper deal with the identified threats; and,
- to identify these provisions' key weaknesses with respect to each debated threat

To achieve these objectives, the study relied on various studies that have documented some of these threats facing the NHI and a review of provisions made in the white paper (2017) in light of the identified threats. This review attempted to determine the sufficiency of these provisions in dealing with the identified threats. Identifying critical weaknesses in the provision would mean that the threats are valid and likely to affect the NHI's performance.

2.2 Literature review on the threats facing the NHI

According to Maphumulo and Bhengu (2019), health system challenges that countries face are primarily due to the shortage of financial resources. As a result, many countries have turned to implementing NHIs, but these have also encountered structural issues. The South African NHI is expected to experience similar challenges, given the inferior administration, inadequate budgets, infrastructure, and drug supply in most public healthcare institutions (Mukwena and Manyisa, 2022). This section contains the conceptual and empirical review of some of the systemic threats to NHIs worldwide and the theoretical framework employed in this chapter in examining these threats – the three-pillar framework introduced by Kutzin (2008).

2.2.1 Conceptualisation of the threats to the NHI

This section describes the identified threats - inadequate administrative and governance structures, lack of and poor distribution of resources and infrastructure and healthcare financing structures -. The focus was on how they constitute potential threats to NHIs.

(i) Inadequate administrative and governance structures as threats to NHIs

Sound healthcare system administration and governance structures are necessary if UHC is to be achieved. Their soundness is based on the ability to ensure the existence of strategic policy frameworks, combined with effective oversight, attention to system design, coalition-building efforts and regulation-upheld accountability (Siddiqi *et al*., 2009; Manyazewal, 2017; Nawaz and Mohamed, 2020). They should also allow for effective interaction among the state, the providers and the citizens in developing comprehensive and costed health policies and strategies that enable effective implementation of all levels of healthcare to move towards UHC (Lagomarsino *et al*. 2012). In turn, the continuous strengthening of health institutions and regulatory frameworks for universal health coverage that contribute to access, quality and risk protection in the healthcare system are realised (Kruk *et al*., 2018).

Thus, inadequacies often manifest as a lack of clearly defined policy frameworks, attention to system design, regulatory frameworks and institutional capacity in such healthcare systems (Yuan *et al*., 2017). The lack of accountability, the poor management of health resources, gross inefficiencies and corruption also typify such systems (Masefield *et al*., 2020). This often becomes a significant barrier to equity in the health system and is detrimental to general health outcomes (Naher *et al*., 2020). Another consequence of a poorly administered and governed system is the difficulty of instituting reforms. System-wide reforms such as NHIs place significant administrative and governance demands on the system. If implemented in a system with inadequacies in this regard, the effect of the highly probable failure can be catastrophic to the system at large.

Further, poor national monitoring of policies and strategies, inadequate control of system players, lack of continual building of health institutions, and poor accountability in major decisions can be an obstacle to the effective implementation of such schemes (McLeod *et al*., 2020; Schneider, 2021). Further, poor interaction between the government, healthcare providers and the population they serve adds to the challenge of advancing UHC. All these aspects are a prerequisite to a successful NHI. Therefore, introducing an NHI in an environment with administrative and governance inadequacies would threaten its success (Alhassan *et al*., 2016). This is because such a scheme fundamentally depends on good administration and governance due to its size, its ubiquity at national, provincial and district levels and its implications for every level of healthcare – primary, secondary and tertiary.

As a remedy, emphasis should be on oversight functions and decision-making processes such as regulatory framework development and budgeting (Mosquera *et al*., 2001). It should also be on multisectoral and inclusive collaboration with all stakeholders that is accountable and transparent, with specific efforts to harness the private sector to help to achieve UHC (Rasanathan *et al*., 2017). Effective monitoring frameworks need to be developed to improve the administration of healthcare systems, and concerted efforts to support the harmonisation and alignment of costed and financed national action plans for health security with long-term national health strategies are needed (Gostin and Katz, 2016). Countries that adopt these approaches may see an improvement in the progress towards universal health coverage, in stark contrast with countries that do not adopt them (Kruk *et al*., 2018).

(ii) Lack of and poor distribution of resources and infrastructure as threats to NHIs

Another vital aspect is the availability and distribution of resources, an avenue through which the capability of healthcare systems is improved (Lamarche *et al*., 2011). The same applies to infrastructure, in its fundamental and inextricable link to resource availability, as it is also a significant component when the capability of healthcare systems is assessed (Palin *et al*., 2020). Resources and infrastructure are critical components in encouraging enhanced standards of treatment for all patients and a positive experience with the healthcare system for both patients and healthcare personnel (Luxon, 2015). To be considered sufficient, the available resources and infrastructure must link the hospital as the centre for acute and inpatient treatment with the larger and broader healthcare system. They should also support the diverse quality domains, including effectiveness, efficiency, timeliness, equity and sustainability (Kruk *et al*., 2018).

Thus, resources and infrastructure inadequacies can be a source of significant challenges. This is especially so for many healthcare systems dealing with high healthcare service demands and changing population needs (Yapa and Bärnighausen, 2018). There are also other issues where the overall quantity of resources and infrastructure is enough for the healthcare system to function well, but problems in meeting the demand for healthcare services stem from poor distribution thereof (Oleribe *et al*., 2019; Yu *et al*., 2019). In both cases, the seamless movement from one point, usually initial referral local hospitals, to specialist tertiary centres and discharge with appropriate care is impeded (Luxon, 2015). Healthcare access ends up being based on socioeconomic status rather than need, leading to a more inequitable system. This can threaten reform that seeks to bring about equity in the system.

At its worst, the inadequacies can cause reforms such as NHIs to become unsustainable and fail in the long term. Healthcare financing schemes are often introduced to eradicate inequalities and inequities of accessibility, attainability and affordability (Ataguba *et al*., 2015; Burger and Christian, 2020), all of which require a significant amount of financial, human and infrastructural resources. This is especially so in healthcare systems characterised by gross historical inadequacies, which may propel the introduction of unsustainably comprehensive benefits packages. The inability or inability of the government to raise enough funds to meet the demand for services could also be another issue (Liaropoulos and Goranitis, 2015). Thus, increasing the amount of resources and infrastructure in a system to improve the capability of healthcare systems may not be possible without the ability to generate enough funds to do so.

An integrated approach to resources and infrastructure management, coordinated on a district, provincial and national level, can ensure their sufficiency and fitness for purpose. This would result in an unimpeded delivery of high-quality clinical services (Leslie *et al*., 2017). Ensuring this sufficiency necessitates examining all aspects of resources and infrastructure, from need formulation through procurement and quality assurance to financed plans for expansion of capacity and replacement. Furthermore, there should be an avenue to analyse and implement acceptable modern technologies and guarantee that resources and infrastructure needs are considered in service development recommendations (Luxon, 2015). Managing risks connected with resources and infrastructure, including responding to adverse situations, should be done within an integrated and coordinated structure.

(iii) Healthcare financing and delivery structures as threats to NHIs

The third component, financing, is essential to a system's capability to meet the population's needs (Reibling *et al*., 2019). In this regard, the focus is usually on the public and private sectors' role in financing and delivering healthcare services (Sparkes *et al*., 2019). The public healthcare sector refers to the amalgam of healthcare activities managed across all government levels, primarily focusing on population health. On the other hand, the private health sector refers to the amalgam of organisations that are not owned or directly controlled by governments and are active in providing health services (De Wolf and Toebes, 2016). There has been a growth in the direct provision of healthcare, management of healthcare facilities, manufacture of healthcare goods and financing of healthcare services by the private sector (Clarke, 2014).

There have been arguments over the morality of the two-tier setup for decades, specifically its impact on UHC, justice and fairness (Fourie, 2017). Critics argue that healthcare services are unique social goods to which everyone should have equal access, unlike other items to which access is based on affordability and socioeconomic status. That is, the fundamental reason for opposition to two-tiered systems is the status hierarchies that they create in the healthcare system (Krohmal and Emanuel, 2007). Supporters of the system, however, argue that people should be as free to purchase healthcare services as they are to purchase any other service if they can afford it. However, allowing individuals to purchase additional healthcare if they want would be more acceptable if everyone’s basic medical requirements could first be met in the public or a regulated private sector (Fourie, 2017).

Overall, how a healthcare system is structured can threaten an NHI seeking to restore equity. Sustainability challenges may be rife if the private healthcare sector is dominant but does not have the incentive to deal with negative externalities that impact the availability, accessibility and acceptability of healthcare services in line with the goal of UHC of ensuring that all people obtain the health services they need without suffering financial hardship when paying for them (De Wolf and Toebes, 2016). This is especially so in a healthcare system where the regulation of the private sector’s involvement in healthcare is weak. Even when financing healthcare services has collapsed to a single fund, contracting private sector healthcare providers may be a source of similar sustainability issues. The private sector is structured to draw resources, which could be at the expense of the public sector.

Accordingly, there is a need for strong regulation of private sector activities (Clarke, 2014), especially with the increasing reliance on private actors in healthcare systems over the years (Church *et al*., 2018; Rahman, 2020; Williams, 2020). This trend can be explained by aspects such as the perceived lack of efficiency and quality in public healthcare provision. Further, from a financial standpoint, the move towards private healthcare has been necessitated by the increased costs and reduced budgets for healthcare in the public sector and the encouragement by international institutions to decrease the burden on national budgets (Basu *et al*., 2012). Therefore, in such two-tiered healthcare systems, governments can allow or encourage people within a system to purchase access to additional medical services. However, this has to be done within the confines of equity and equal access to primary care.

This conceptual examination of the administration and governance of healthcare systems, resources and infrastructure availability and distribution and healthcare system setup highlights why their consideration in implementing the NHI is of utmost importance. These aspects determine the kind of foundation that the scheme will be built on and, therefore, its successful implementation and sustainability. The failure to ensure that a conducive environment has been established in the healthcare system for the NHI to succeed by allowing these inadequacies to prevail until the scheme is launched may result in sustainability issues at its very onset. In the worst-case scenario, implementing the scheme on a dilapidated foundation due to these inadequacies may worsen the current challenges, such as inequity and a quadruple disease burden in the healthcare system.

2.2.2 Theoretical framework employed in the analysis of systemic threats

In the analysis of the provisions set in the NHI white paper that relates to the systemic threats facing the scheme, Kutzin's (2008) three-pillar framework was used. The first pillar is based on a set of objectives for health finance policy, grounded in the core values espoused by the WHO (2000). In this regard, from the broad financing policy objectives of promoting universal protection against financial risk and equitable distribution of the burden of funding the system, Kutzin (2008) derived four instrumental, intermediate financing policy objectives:

- promoting equitable use and provision of services relative to the need for such services;
- improving transparency and accountability of the system to the population;
- promoting quality and efficiency in service delivery; and
- improving efficiency in the administration of the health financing system.

The second pillar comprises a framework for analysing the organization of national health financing systems based on a description of the functions and policies associated with all health financing systems. According to Kutzin (2008), such a descriptive framework is essential for tailoring any analysis to consider specific reforms in specific country contexts. This is because how a health financing system is organized provides the starting point for any reform. The third pillar consists of recognition and analysis of how key contextual factors, particularly fiscal constraints, limit the extent to which a country can sustain the achievement of the policy objectives and may limit the range of policy options that can be considered (Kutzin, 2008). Thus, this pillar allows for a realistic analysis of what is feasible.

Creating a single fund may promote equitable use and provision of services. This is an instrumental, intermediate financing policy objective (Kutzin, 2008). This would be possible because, as a single fund, the scheme can improve cross-subsidisation in the overall health system. Also, it can ensure that funds are collected based on individuals' ability to pay, whereas benefits from health services align with individuals' need for healthcare. The single fund may also enjoy economies of scale, especially administrative economies. Even with the enduring argument based on the ills of centralisation on the equitable use and provision of services, there is the expectation that central hospital semi-autonomy and the establishment of district management offices will counter centralisation. These two provisions will allow for facility, district and provincial-specific decision marking necessary to promote equity.

However, the same cannot be said about improving transparency and accountability of the healthcare system to the population or promoting efficiency in service delivery. A single fund makes it significantly hard to ensure accountability, especially with an apparent lack of specific and practical ways to counter corruption. Also, there is a likelihood that a single fund will have significant inefficiency in administration. Although the government has reiterated that efficient administrative systems will be implemented to ensure that all funds are appropriately channelled into the scheme for financing health services, that remains to be seen. Yet the scheme is said to be ready for full implementation. There are diseconomies of scale, as highlighted in some parastatals in South Africa, and there is no specific provision to counter the likely inefficiency that such a colossal entity may create as the national health fund.

The single-fund approach could also significantly constrain the facility, district, and provincial structures meant to counter some of the ills of centralised healthcare financing. This is because semi-autonomy has a significantly higher need for decentralising management functions and responsibilities at a facility level, which may be hard to achieve. There is also a great demand for meticulousness in ensuring that national health policy priorities and health needs in the district are aligned. There is a significant risk of incoherence between the district and national levels. Context-specificity should not only be on service provision as intended in the case of the NHI. Instead, it should be seen in the entirety of the reforms. What the proposed structure does is that it creates a divide between service provisions and service financing, thus reinforcing some of the ills in the current healthcare system.

2.2.3 The threats to the South African NHI

As mentioned above, several studies have been conducted globally to explore various systemic threats to the impending NHI. In this section, these empirical studies are reviewed, focusing on the inadequate administration and governance, the resources and infrastructure unavailability and maldistribution and the two-tier healthcare system setup. Of note, this section focused only on the studies conducted to review and appraise the impending South African scheme, not international schemes. The reason is that international evidence on other countries' NHIs was employed as a source of information in evaluating the proposed South African scheme. The details of the search for this international literature and how they were employed in this analysis are described in Section 2.3, which follows below.

(i) Administration and governance in the healthcare system

It is not surprising that in literature, the poor government administrative capacity, primarily due to the lack of skills and rampant corruption, is one of the most mentioned threats to the NHI. For instance, Rusch *et al*. (2012) reported that the NHI was under threat from corruption, accounting for about 10% of all healthcare expenditures in the country. It hampers system efficiency, policy development and spending priorities. Marten *et al*. (2014) mentioned that it is risky to pool all funds into a single fund when there are no robust governance and accountability mechanisms. Poor administration costs may far outweigh the economies from pooled funds. Pillay-van Wyk *et al*. (2016) reported a failure in public sector healthcare delivery caused by poor leadership and inadequate management. This was also reflected in a lack of vision, clear philosophy and goal setting.

Twala (2014) linked the noted poor administration to the increased affirmative action in South Africa, characterised by corruption and is based on affiliation rather than merit. Affirmative action results in the loss of institutional memory and many other problems associated with inexperienced managers in senior positions (Coovadia *et al*., 2009). This argument is contrary to Baker (2010), who contends that structures of apartheid are to blame for the government's insufficient administrative capacity. Passchier (2017) also pointed out the poor governance, lack of accountability, and acute corruption that has led to several provinces going into chronic budget deficits as a significant threat to the NHI. He further asserted that, in addition to the state's inadequate administrative and managerial capacity, the scheme's implementation would be constrained by poor coordination between national, provincial, and district levels.

This accords with Blecher *et al*. (2019). They argued that appropriately re-assigning health functions among these three government spheres are critical for implementing the NHI. However, this topic is sensitive because the restructuring will substantially reconfigure the scope of provincial governments in the healthcare system. Opposition to such efforts will likely ensue. Yet, the NHI cannot be implemented efficiently without such reconfiguration. Taken together, these findings highlight why the South African healthcare system has experienced most of the problems it faces today. While corruption is problematic, the lack of administrative skills may be a much more significant challenge. Concerningly, without the excellent stewardship required to run a healthcare system, implementing a well-functioning scheme may be more challenging than initially thought.

(ii) Resources and infrastructure availability and distribution

Besides the critical focus on administration and governance, some studies have been dedicated to examining issues related to resources and infrastructure. In one such study, Sanders *et al*. (2010) reported that the inadequate and poor distribution of health workers threaten the proposed scheme. There are no clear strategies for recruiting and retaining workers, and most community health workers remain peripheral to the system. Sekhejane (2013) also noted that the proposed scheme does not address behavioural issues and the shortage of healthcare workers. The proposal to source private practitioners will probably cause them to raise their service-delivery prices because of the conditions they will have to serve. Marten *et al*. (2014) noted that human resources are a severe challenge to the NHI. They argued that the broad range of services proposed in the scheme could not be delivered without additional staff.

A further evaluation by Surrender *et al*. (2016) showed that general practitioners in the public sector have low morale due to poor infrastructure, lack of administrative support, and stressful working conditions. Further, the remuneration in the public sector is meagre and would be insufficient to attract most private practitioners to the NHI facilities. Yet, according to Passchier (2017), the country needs to triple its number of doctors to work and attract a considerable number of the 70% of total medical practitioners in South Africa who prefer to work in the private sector. However, the discouraging work environment in the public sector makes the latter hard. This is currently the case despite the NHI providing the opportunity for much-needed human resources planning on a more systematic and regular basis, as argued by Smith *et al*. (2018). South Africa still has no ongoing process to enable such planning.

Smith *et al*. (2018) further noted an absence of public, audited, and regularly updated statistics on the number and mix of health workers available and required for South Africa. Blecher *et al*. (2019) also noted that the weak technical skills and understanding of strategic purchasing and its relevance at all government levels remain a key challenge in the scheme's roll-out. There is still little practical knowledge of strategic purchasing in government regarding the proposed capitation models for primary healthcare purchasing and a diagnosis-related group model for hospital purchasing. Together with underperforming institutions due to poor management and underfunding, these challenges further compound the healthcare system's challenges (Michel *et al*., 2020). Overall, as in the case of poor administration and governance that characterise the system, the resources and infrastructure inadequacies may adversely affect the implementation of the much-needed NHI in the country.

(iii) The two-tier healthcare system setup

Finally, in addition to administration and governance as well as resources and infrastructure concerns, some studies have investigated the threat that a robust private healthcare sector presents to the NHI. For instance, Rusch *et al*. (2012) noted that the disparity in healthcare quality has resulted in high service tariffs owing to the ongoing over-servicing of patients on a fee-for-service basis. As long as a healthcare system parallel to the public tier exists, the NHI will remain under the threat of high coverage costs propagated by the private sector providers. This will especially be the case if the government relies more on private providers where the national health fund will purchase some of the services. However, reversing that when the NHI is implemented might be too arduous for a government that lacks the requisite administrative capacity and control of the healthcare system.

The findings by Rusch et al. (2012) align with Sekhejane (2013), who noted that there is little chance that those on medical aid will abandon private hospitals. Therefore, it is unrealistic for the planners of the NHI to suppose that there will not be a well-functioning private healthcare system and skewed distribution of resources even if financing is collapsed into one fund. Further, Marten *et al*. (2014) noted that the government’s push towards UHC via the NHI faces opposition from some groups that will be adversely affected by the reforms. Thus, this sector's intended level of cooperation in the NHI might not be attainable. Yet, it is vital if the NHI is to succeed because, as Katuu (2016) reported, the legacy of fragmentation is evident in the parallel private and public sectors. The latter has a disproportionately lower amount of financial and human resources than the former.

Even if the private sector cooperates, Passchier (2017) noted that the intended private-public partnerships may be risky and costly and can fail to advance universal and equitable health coverage. Furthermore, the high cost of private-provider fees is currently a barrier to expanding partnerships with the NHI. For instance, Blecher *et al*. (2019) argue that the lack of progress with purchasing from private providers may partly result from a preference towards public sector strengthening but may also be due to the private sector being significantly more expensive than the public sector. The government's failure at multiple levels to regulate the private sector effectively and safeguard the rights of health service users has been noted. A possible remedy is to ensure that public sector providers produce good quality healthcare that competes with private sector care. However, that is unlikely.

Overall, the review of published literature allowed the study to identify the valid primary threats to the successful implementation and operation of the NHI in South Africa. This was according to the first research question of this chapter. Particularly, administrative and governance inadequacies, resources and infrastructure insufficiencies and the two-tier healthcare setup were identified. The conceptual examination of the same issues also allowed for a better understanding of how they threaten the impending scheme. Accordingly, the other two questions relating to the sufficiency of the provisions in the NHI white paper in dealing with the identified threats and the provisions' key weaknesses with respect to each debated threat could be answered based on the materials and methods described below.

2.3 Materials and methods in the analysis of systemic threats to the NHI

This chapter systematically reviewed the literature to explore the remaining two questions. Schmutz *et al*. (2019) described systematic reviews as the methodical collection, evaluation and synthesis of empirical study findings to provide a summary of evidence relevant to answering a set of questions. Systematic reviews aid the analysis and dissemination of evidence, using rigorous and transparent methods to generate empirically attained answers to focused research questions (Paez, 2017). Of note, evidence attained by numerous studies that may be reviewed in a systematic review may be significantly specific to different settings (Mallett *et al*., 2012). Bunn et al. (2015) consistently noted that systematic reviews often include studies from diverse settings and cover several decades. However, there are many frameworks and tools for handling context (Bunn *et al*., 2015; Booth *et al*., 2019).

The choice to use systematic reviews was based on their frequent use in healthcare policy research (Govere and Govere, 2016; Keel, 2017; Barasa *et al*., 2018; Drolet *et al*., 2018; Granja *et al*., 2018; Mitchell *et al*., 2018, Fatima *et al*., 2019; McCartney *et al*., 2019). Further, according to Moosapour *et al*. (2021), due to the unmanageable amounts of information inundating policymakers, the need for systematic reviews to efficiently integrate existing information and provide data for rational decision-making is high. This is why they have been applied in broad contexts such as the examination of activity-based healthcare costing (Keel, 2017), health organisational resilience (Barasa *et al*., 2018), vaccination cost-effectiveness (Drolet *et al*., 2018), the success of eHealth interventions (Granja *et al*., 2018) and the link to hospital staffing of healthcare-associated infections (Mitchell *et al*., 2018).

Further, the information required for the pre-implementation evaluation of public policies is primarily found in research articles and policy documents. This is suitable for systematic reviews (Shaw *et al*., 2004). Thus, the evidence from international healthcare systems studies on aspects related to the three forms of systemic threats as identified in the literature review for South Africa was examined using systematic reviews. Given that most of the studies focus on varying aspects and not all three issues at once, a systematic review of the evidence they provided was considered suitable in bringing it all together to focus on the questions regarding the threats to the NHI. In this section of the study, the search strategy, the inclusion and exclusion criteria, quality appraisal and the analytical procedure, in that order, are described.

2.3.1 Literature search strategy

The first step in systematic reviews is the search for relevant studies, the quality of which is highly dependent on the search tool (Ferreras-Fernández *et al*., 2016). The most popular search tool in healthcare policy studies is the patient, intervention, comparison, outcome (PICO) model, which retrieves the most significant number of relevant studies for review for formulating clinical questions. (Eriksen and Frandsen, 2018). Other models include the sample, phenomenon of interest, design, evaluation, research type (SPIDER), setting, perspective, intervention, comparison, evaluation (SPICE) and unguided search (Booth, 2006; Cooke *et al*., 2012). In this chapter, the truncated PIC version of the PICO model was used because some outcome measures are not mentioned in the abstracts. Including a search block defining the outcomes would have excluded relevant studies (Higgins *et al*., 2019).

Three separate searches were run on PubMed, Econlit, EbscoHost, Google and Google scholar using the PIC model on an ongoing basis from December 2020 to June 2021 to ensure a higher level of comprehensiveness and representativeness of the studies identified, which, according to Harari *et al*. (2020), influences the quality of conclusions derived from the review. It also allowed for more focused searches covering all three themes rather than general searches; the latter would have produced too many irrelevant studies and articles that would have consumed time in sorting and screening. Further, the PIC model would have been weakened if the searches had not been separated into three as follows:

- Search 1: "Administration of health care systems"
- Search 2: "Resource and infrastructure availability and distribution"
- Search 3: "Two-tier system"

The selected papers' reference lists were also searched for more papers relevant to the analysis. However, no period limit was imposed in the search as many of the schemes on which the studies are based have been in operation for several years. Per Dalglish *et al*. (2020), systematic reviews allow for understanding policy content across geographies, contexts, and time frames. This was considered necessary because the study evaluated a scheme that has not been implemented and is likely to go through the same stages of development that some of these studies reveal. The study also did not limit the number of studies per country. This is because different studies may have looked at similar aspects from different perspectives. Examining the findings of such studies would, therefore, allow for a more rounded view of the issues.

Documents had to contain information about healthcare administration and governance, resources distribution and availability and healthcare systems set-up. They also had to be empirical published or working papers on existing healthcare systems rather than theoretical or conceptual papers. Empirical research is based on observed and measured phenomena and derives knowledge from experience rather than theory or belief (Barasa *et al*., 2018). Documents not written in English, only available as abstracts, as well as letters, editorials, and commentaries, were excluded from the study. Further, documents without any mention of any possible formulations of the phrase 'national health insurance' in the text were considered irrelevant for use in the evaluation of the NHI and, therefore, excluded from the study.

The initial search for documents under the three searches on administration, resources and two-tier setup yielded 107 documents, as shown in Figure 2.1 below. This search also included snowballing for more documents. The figure also shows that after removing duplicates from the 107 documents initially found, 92 documents remained. The abstracts of these remaining documents were reviewed to check for relevance to the focus of the study – the systemic threats against the NHI. 48 documents remained after removing duplicates and irrelevant documents based on the abstracts. The full texts of the 48 documents were then reviewed for relevance to the study, as it is possible that the abstract might sound relevant while the actual study is not. 25 documents remained after the final review and were included in the study for analysis.

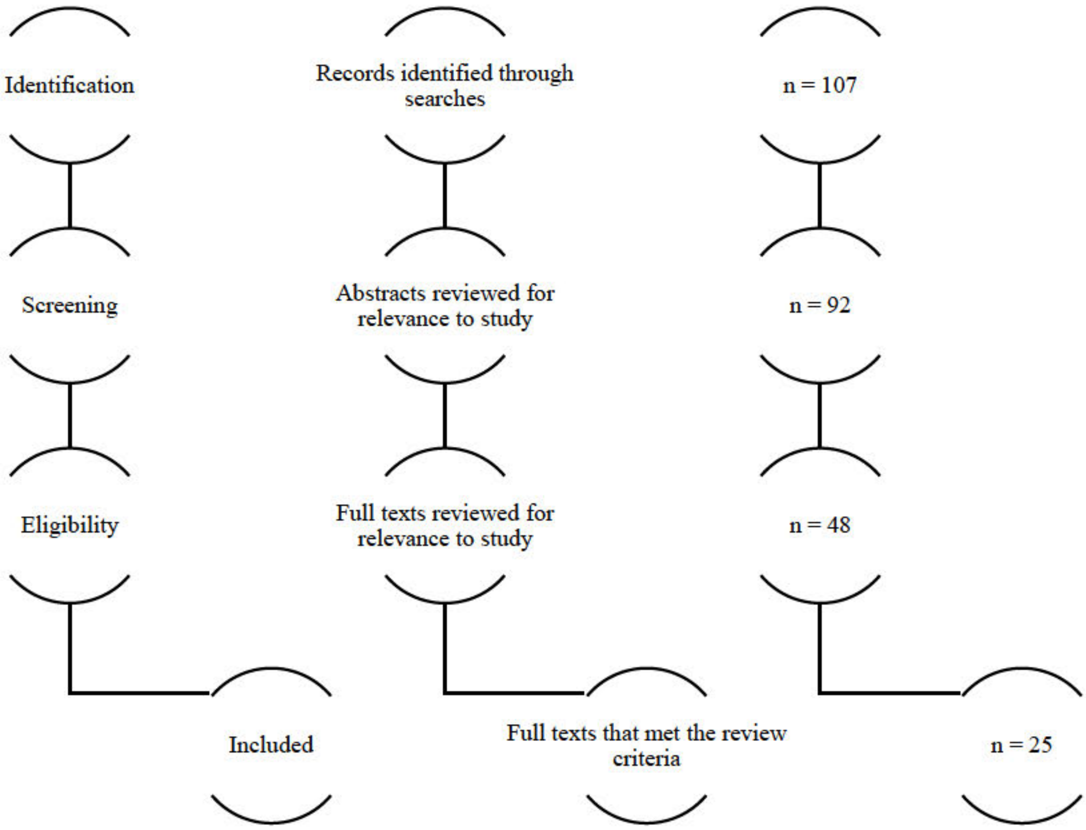


Figure 2. 1 Data collection process and applied inclusion criteria.

Source: Author's own compilation (2022)

2.3.2 Quality appraisal of the reviewed literature

Subsequently, the CASP tool was used to ensure quality in the review of the studies selected. This uses a checklist approach with screening questions to assess the adequacy, trustworthiness and relevance of the evidence reported in the articles (CASP, 2017). The questions that have to be answered in the affirmative when conducting the quality appraisal are as follows:

1. Was there a clear statement of the aims of the research?
2. Is the methodology used for the study appropriate?
3. Was the research design appropriate to address the aims of the research?
4. Is the recruitment strategy appropriate for the study's aims?
5. Was the data collected in a way that addressed the research issue?
6. Has the relationship between the researcher and the participants been considered?
7. Have ethical issues been taken into consideration?
8. Was the data analysis sufficiently rigorous?
9. Is there a clear statement of findings?
10. How valuable is the research?

Subjecting the selected studies to this criterion ensures that all the aspects relating to the study aim, methodology, design, data and findings are captured and noted. Once the studies satisfied this criterion, they were included in the analysis.

2.3.3 Analytical procedure

From the selected studies, the next step was to extract information for use in the analysis. A data extraction form was used under the supervisors' full supervision to improve the process' trustworthiness. According to Shokraneh and Adams (2017), this form helps reduce the number of errors and data wastage. The data was then imported into the NVivo qualitative data analysis software program (QSR International, 2020). The analysis entailed a conventional inductive content analysis, a technique used to identify themes by studying documents (Elo and Kyngäs, 2008). The inductive approach was preferred because the analysis sought to answer a research question – are the provisions adequate in protecting the scheme – rather than test a theory (Graneheim and Lundman, 2004). Identifying themes in the data began with open coding to create codes based on the meaning that emerged from the data (Hsieh and Shannon, 2005).

As alluded to above, the first question about identifying systemic threats from published literature was answered based on South African studies' conceptual and empirical literature review. This part of the chapter was geared more towards answering the second question on the sufficiency of provisions in the NHI white paper in dealing with the identified threats and the critical weaknesses concerning each debated threat. Any themes from international studies that referred to the same systemic threats in the respective schemes and healthcare systems that matched the ones identified to be facing the impending NHI were identified. This took the form of noting the study's objectives to establish context and identify the risk or threat to the respective NHI in the study. These were also used to determine the sufficiency of set provisions to deal with threats to the scheme.

2.4 A review of the international evidence on systemic threats

The searches and screening of the documents yielded varying numbers of relevant studies under each threat. This section documents the brief reviews of these included studies. The brief reviews aimed to provide context and a foundation for the evaluation of the provisions in the scheme. Tables with summaries of each study's objectives and the documented risks/threats to the respective NHIs are also provided under each section.

2.4.1 A review of studies on administrative aspects

Many studies among those selected examined various administrative aspects of healthcare systems. Table 2.1 below summarises the objectives and the risks identified in each study. In one such study of the Canadian healthcare system, Philippon and Braithwaite (2008) found that decentralisation became a barrier to healthcare access in the country. Assigning primary accountability to the provincial level to deal with various demerits of centralised healthcare only caused tension between the provincial governments and the communities they served instead of improving healthcare service delivery in those communities. This shows that decentralisation is not always the answer when simplifying healthcare system administration. On the other hand, Australia had a high level of centralization, which promoted efficiency through increased accountability.

The Australian experience could have resulted from the increased emphasis on accountability for general healthcare and the equity impacts of policies. The Health in all Policies approach adopted by Australian regional governments could also be an explanation. Horizontal governance was also promoted to create a continuous, formalised, yet flexible mechanism to engage departments across government and acknowledge interests, values and positions within institutions (Kickbusch and Buckett, 2010). However, a higher degree of intervention by the government in health policy issues led to over-tampering by policymakers and administrators (Philippon and Braithwaite, 2008). Thus, although centralisation affords greater control over important aspects such as costs and quality of care, it also has its limits and demerits, as seen in the Australian case.

In Turkey, the government expanded coverage through the health transformation program. Therein, insurance schemes were consolidated to eradicate segmentation in financing and improve control of the larger schemes. The Turkish government also created a family medicine system and integrated all public hospitals (Atun *et al*., 2013). The program constituted a comprehensive strategy led by a transformation team, rapid policy translation, flexible implementation with continuous learning, and demand and supply-side improvements. Turkey managed to bring about significant simplification and personalization of the health system through the health transformation program, which contributed to the breadth and width of improvements in healthcare and health outcomes observed throughout the country.

The institutional separation between public health services, ambulatory care and hospital inpatient care was established in Germany (Busse *et al*., 2014). This allowed the government to provide comprehensive benefits at low cost and high technical efficiency. Further, control became easier. However, this structure has become a barrier to change and integrated care as it hinders the coordination and continuity of patient treatment. The coexistence of statutory and substitutive private health insurance has also weakened the principle of solidarity. A complex stewardship framework promotes incrementalism, making it more difficult to implement reforms (Blumel *et al*., 2020). Germany, as in the case of Turkey, could have benefited more from the consolidation and simplification of some aspects of its healthcare system

In China, Ramesh *et al*. (2014) found inadequate attention to critical aspects of health governance, with the focus mainly on the financing aspects. Also, a limited understanding of incentives shaping healthcare providers' behaviour led to a rapid emergence of unchecked profit-oriented services by government controls that threatened the scheme. The Chinese experience shows that a scheme can quickly become unsustainable without robust control. In contrast, Huang *et al*. (2014) showed how the Taiwanese healthcare administration is centred around the strict control of costs and providers. The diagnosis-related groups' payment system, the global budget system and strict reviews of medical expenditures are all built into the administrative activities of the scheme. All these aspects of managing the scheme have contributed to its success.

Cheng *et al*. (2015) also showed that the Taiwanese NHI was set up so its administrators could easily control it and keep the lid on its five sectoral global budgets. These studies highlight how the administration and governance of the Taiwanese healthcare scheme are geared towards ensuring adequate cost control and reveal its robust capacity to control costs in the scheme. However, the failure to design a flexible system that adjusts to changing healthcare needs of the citizenry saw Taiwan's medical expenditures outgrow the revenues the scheme was generating. This caused the sustainability of the Taiwanese scheme to wane over time. The overemphasis on cost control also came at a cost for sufficient and quality healthcare. Part of administrative competency is seen by allowing flexibility and swift response to changing needs.

Atun *et al*. (2015) reported that most Latin American countries combined demand-side changes to alleviate poverty and comprehensive primary care to extend service access. These multi-angular reforms allowed the countries to learn from experiences, refine reforms and establish context-sensitive approaches. In China, the Lancet (2016) showed that separating the NHI into three schemes allowed the country to extend coverage to 95% of the population. The scheme evolved to allow for adjustments to be implemented quickly. Further, Yuan *et al*. (2017) noted the prioritization of system development, maintenance of a hierarchal administrative system, enhancement of local governments' ability to adopt policy measures and the accumulation of the evidence generated from local practices in the Chinese NHI. However, poor collaboration between different government departments undermines the schemes.

In another German study, Busse *et al*. (2017) noted the significant emphasis on market orientation. However, self-governance jeopardized the continuity of care, leading to an oversupply of care. The system also struggled with changing population needs. In Australia, Mossialos *et al*. (2017) noted the extensive intergovernmental collaboration, focusing on the highest-priority issues. State governments devolved the management of hospitals to local hospital networks. Canada also had a notable level of decentralization; provinces had primary authority over systems, and providers were self-governing. In China, they noted the importance of a dedicated agency for health control and ensuring that government agencies are responsible for the various health functions specific to their areas of expertise. Further, national and local commissions were responsible for all health issues in their jurisdictions.

In Singapore, Ong *et al*. (2018) showed how regional systems enhanced holistic care, tackling social determinants of health and developing new models of care. However, these regional systems also came with poor goal alignment and integration across clusters due to differing care capabilities, incongruent financing structures, and disease and provider centricity. In South Korea, Lee *et al*. (2018) highlighted the separation in administration between supervision and policy decisions, enrolment, collection of contributions, medical fee schedules and reviewing medical fees and healthcare evaluation. Further, there are divisions in insurance based on employment, and the poor have a medical aid program to support them. The separation of the administrative functions in the South Korean theme noted by Lee *et al*. (2018) highlights the importance of administrative specialisation in healthcare.

In another Canadian study on the highly decentralised collection of provincial and territorial insurance plans, Martin *et al*. (2018) noted a lack of sustainable healthcare delivery models and coordinated action on the social determinants of health. Policies aimed at expanding the basket of services, coordinated efforts to reduce variation in healthcare outcomes and public engagement in system stewardship were also lacking. Dixit and Sambasivan (2018) noted resource allocation and performance improvement problems in the Australian healthcare system due to the lack of an interdisciplinary approach to policy. This required new models in which financial performance, healthcare quality and patient outcomes are blended. This study highlighted the importance of an interdisciplinary approach to resource allocation and performance improvement, without which any healthcare financing scheme would fail.

These studies show the diversity and commonality of administrative and governance threats to NHIs. These include challenges related to the centralisation and decentralisation of decision-making authority (Philippon and Braithwaite, 2008; Kickbusch and Buckett, 2010; Busse et al., 2014; Busse et al., 2017; Martin et al., 2018; Ong et al., 2018), cost-control mechanisms (Huang et al., 2014; Ramesh et al., 2014; Cheng, 2015), poor coordination and interdisciplinary linkages in policy (Yuan et al., 2017; Mossialos *et al*., 2017; Dixit and Sambasivan, 2018), poor development of context-sensitive approaches (Atun *et al.*, 2015) and the lack of administrative specialization (Lancet, 2016; Lee et al., 2018). The existence of these threats in both developed and emerging markets shows how ubiquitous they are and why South Africa has to be careful in the design and implementation of its NHI.

Table 2. 1: Administrative and governance risks

Author and country	Study objective	Risk/ threat to the NHI
Philippon and Braithwaite (2008) Canada and Australia	To trace the origins and key milestones in the evolution of governance models in Canada and Australia.	Decentralization is a source of tension, and centralization is a cause for over-tampering from policymakers.
Kickbusch and Buckett (2010) Australia	To examine challenges for Health in All Policies and policy integration and governance for equity.	Decentralization with no consideration of policy decisions impact on healthcare across all levels of governance
Ramesh *et al*. (2014) China	To examine the role of health governance in shaping the outcomes of healthcare reforms in China	Limited understanding of the behaviour of providers, poor control of providers and information asymmetry
Buse *et al*. (2014) Germany	To review developments in organization, financing, provision, reforms and health system performance in Germany	Institutional separation is a barrier to change and integrated care due to weak capabilities in poorer provinces
Huang *et al*. (2014) Taiwan	To examine the measures taken by the NHI Administration to slow the growth of medical expenditures.	Poor cost and private provider control and the lack of flexibility in adjusting to changing needs
Cheng (2015) Taiwan	To examine the Taiwanese National Health Insurance experiences and extract lessons on healthcare insurance	The policy is inadequate in ensuring adequate cost control and ensuring that spending matches available resources
Atun *et al*. (2015) Latin American countries	To examine reforms for strengthening health systems to reduce inequalities in health access in Latin America	Lack of multi-angular reforms and failure to learn from experiences and establish context-sensitive approaches
Lancet (2016) China	To examine China's 3-segmented health insurance schemes to be merged as announced by the State Council of China	Poor manageability due to the lack of divisions in the scheme to focus on different subpopulations
Yuan *et al*. (2017) China	To examine the role of systems of governance in designing and implementing insurance schemes	Poor collaboration between different government departments and levels in a decentralized system
Busse *et al*. (2017) Germany	To describe how the German NHI expanded coverage and packages at low cost-sharing	Lack of competition and market orientation leads to monopolistic inefficiencies and unsustainability
Mossialos *et al*. (2017) Australia, Canada and China	To present overviews of the healthcare systems of various countries, with each overview covering multiple aspects	Lack of extensive intergovernmental collaboration in a scheme with a decentralized system
Ong *et al*. (2018) Singapore	To identify the health challenges and opportunities for the implementation of the Regional Health Systems	Poor regional systems performance due to differing capabilities, financing structures, and orientation
Lee *et al*. (2018) South Korea	To analyze the issues facing the NHI with emphasis on financial and consumer behavioural aspects	Lack of administrative specialization in healthcare as a cause of inefficiency and cumbersome administration
Martin *et al*. (2018) Canada	To review Canada's healthcare system and its performance in terms of global health leadership	Decentralization as a source of unsustainability and poor coordination on the social determinants of health
Dixit and Sambasivan (2018) Australia	To review the Australian healthcare system and compare it to similar systems to highlight the fundamental problems	Resource allocation and performance improvements problems due to the lack of an interdisciplinary policy approach

Source: Author's own compilation (2022)

2.4.2 Resources and infrastructure availability and distribution

Several other studies focused on resources and infrastructure availability and distribution. Table 2.2 summarises these studies. In one of these studies, Ashton *et al*. (2008) reported that the restructuring of the health sector in New Zealand encouraged local decision-making, local responsiveness and new funding arrangements, all of which eased concerns about inter-regional equity regarding resources. That is, the country managed to improve resource distribution through policy efforts. The system became less commercially oriented as the collaboration between district health boards improved. However, the integration of purchasing and provision and the focus on financial deficits inhibited the development of partnerships between district health boards and non-government providers and of longer-term funding arrangements for high-quality providers, services and resources.

Shinjo and Aramaki (2012) found a strong relationship between the geographical distribution of resources, service provision, and interregional patient flow across different regions in Japan. However, despite a higher elderly ratio, excessive patient outflow areas had scarce resources in hospitals and clinics. Resource distribution policies did not consider cost, access, quality, efficiency and equality, thus affecting the effectiveness and sustainability of the healthcare system. Nuti *et al*. (2012) examined how European countries responded to the financial crisis-driven scarcity of healthcare resources. While some governments maintained healthcare expenditures to protect the vulnerable, some significantly reduced costs by cutting the services delivered. In a way, this shifted the healthcare costs from the public purse to private households, thus undermining the survival of the health system and universal coverage.

Marten *et al*. (2014) noted that two of the most prominent challenges in achieving UHC in Brazil, Russia, India, China, and South Africa were the inability to raise sufficient funding and meet the demands of more human resources. Further, the Brazilian private sector draws resources away from the public sector, contributing to inequity, inefficiency, and low effectiveness, while China has significant regional variability in the distribution of resources. In China, Liu *et al*. (2016) noted that the inequitable allocation of health resources had become an obstacle to health services utilization. While the total amount of healthcare resources increased because of reforms, regional differences still significantly impacted the overall equity in health resource allocation. Without comprehensive measures from a multidisciplinary perspective, inequity in health resource allocation would be hard to resolve.

Sun and Luo (2017) also noted that China's challenges are due to poor equality and efficiency in resource allocation and, in turn, health services utilization in the context of rapid economic growth. This is attributable to the distinct regional disparities in economic development. The poorer areas experienced prohibitive costs of care which hindered their access to health services, while there was a concentration of services for the more affluent populations. In the South Korean scheme, Kwon (2018) noted some challenges because policy priority was given to coverage, with low contributions and a limited benefits package. This resulted in insufficient protection for the insured and engendered challenges to financial sustainability due to profit-seeking behaviour and the overprovision of care by private-sector providers. The rapid ageing of the population and a lack of resources worsened the challenges in the system.

Benatar *et al*. (2018) noted that the Canadian single-payer system was focused on reducing costs rather than resource allocation. Thus, Canada continues to experience challenges relating to timely access to care, and the rural areas are the most adversely affected, with indigenous people especially vulnerable. This is worsened by poor retention of health professionals due to high professional incomes in the United States. Herwartz and Schley (2018) found that healthcare provision in Germany exhibited significant geographic variation with a heterogeneous allocation of medical services, resources and infrastructure in rural and urban areas. The relationship between socio-economic factors and efficiencies was the possible transmission channel to health; the inconsideration of socio-economic conditions had caused poor resource allocation in the system.

Yu *et al*. (2019) reported significant fragmentation in governance and substantial incoordination rooted deeply in China's legacy of centrally-planned systems. This results in unevenness in the contemporary distribution and performance of healthcare resources. As such, the healthcare system has been unable to adjust to the citizens' healthcare needs that have become increasingly diversified according to affordability, health conditions, and perceptions. In India, Zodpey *et al*. (2021) reported severe challenges regarding the availability of health professionals due to poor capacity building, poor personnel management, non-existence of career structures, inadequate staff supervision, lack of motivation, failure to limit the outflow of trained health professionals to foreign countries and poor working environment, all worsened by uneven geographic distribution and availability of health resources.

Wang and Wu (2021) reported that since the outbreak of the SARS epidemic in 2003, the Chinese government increased financial inputs to bolster the healthcare system's resilience to healthcare services demand shocks. Nevertheless, the covid-19 pandemic exposed China's geographic maldistribution of health resources. Compared with cities without SARS case reports, exogenous health shocks significantly increased the affected cities' medical resources supply. Further, the SARS event increased the financial autonomy of the epidemic-affected cities, thus providing an incentive for local governments to increase health resources. Meanwhile, health shocks influenced the regions with only imported cases less than the infected area. These findings explain the inequality in the distribution of health resources in China and how the country has failed to address this challenge adequately.

Table 2. 2: Resources and infrastructure availability and distribution risks

Author and country	Study objective	Risk/threat to the NHI
Shinjo and Aramaki (2012) Japan	Examine the link between distribution of resources, service provision, and interregional patient flow in Japan.	Poor distribution of resources due to inconsideration in policy resulting in ineffectiveness and unsustainability
Nuti *et al*. (2012) Various European countries	To examine financial crisis implications on expenditure and approaches used to cope with this challenge	Constrained resources reduced resilience of the health system, and cost-shifting to private households threatened UHC
Marten *et al*. (2014) BRICS countries	To review the national efforts to achieve UHC using a broad range of health indicators	Insufficient funding and human resources contribute to inequity, inefficiency, and low effectiveness
Liu *et al*. (2016) China	To understand the changes in health resource allocation and factors influencing equity in China.	Regional unevenness reduced equity in resource allocation, hard to resolve without a multidisciplinary perspective
Sun and Luo (2017) China	To evaluate the equality and efficiency of health resources allocation and health services utilization in China.	Regional economic disparities lead to the prohibitive cost of care in poor areas and concentration of service in richer areas
Kwon (2018) South Korea	To understand the tools – policies, instruments, and institutions used to expand health coverage	Poor policy priority on resources leads to insufficient protection of the insured and inability to respond to changing needs
Benatar *et al*. (2018) Canada	To examine the complexity of achieving equity in Canada and South Africa and to identify lessons	Lack of resources allocation leads to poor access, poor areas vulnerability and poor retention of professionals
Herwartz and Schley (2018) Germany	To analyze how socioeconomic factors influence the regional distribution of inefficiencies in healthcare provision	No consideration of socio-economic impact in resource allocation led to regional deprivation and inefficiencies
Yu *et al*. (2019) China	To analyze government administrative structures and develop an evaluation framework for assessing hospital quality	Fragmentation and incoordination caused resource distribution unevenness and poor response to changing needs
Zodpey *et al*. (2021) India	To suggest strategic options to fix health service delivery challenges and public health by focusing on human resources	Poor capacity building, uneven distribution of other resources, poor personnel management
Ashton *et al*. (2008) New Zealand	To examine allocation of resources in the decentralized system and the extent to which stated objectives are achieved.	Poor relationships between DHBs and providers and longer-term funding arrangements for high-quality providers.

Source: Author's own compilation (2022)

Overall, as in the case of administration and governance threats to NHIs, the lack and poor distribution of resources and infrastructure are significant threats to the successful implementation and long-term sustainability of NHIs internationally. Several studies reviewed in this regard noted the lack of resources and infrastructure (Nuti et al., 2012; Marten et al., 2014; Benatar et al., 2018), the poor distribution thereof (Shinjo and Aramaki, 2012; Yu et al., 2019; Zodpey et al., 2021) and inadequacies in policies that are supposed to deal with these challenges (Ashton et al.2008; Shinjo and Aramaki, 2012; Liu et al., 2016; Sun and Luo, 2017; Kwon, 2018; Herwartz and Schley, 2018). Without ensuring that provisions guarantee sufficient resources and infrastructure are available and equitably distributed, the impending NHI might end up worsening the inequity in the system.

2.4.3 The two-tier healthcare system

The third group of studies focused on the threats posed by a two-tier system setup to an NHI. Table 2.3 below summarises these issues. Risk selection was a significant issue raised in two-tier systems, mainly where insurers exploit risk heterogeneity by altering plan offerings (van Kleef *et al*., 2019). Providers also exhibited a similar behaviour; European public hospitals tended to treat older patients with lower socioeconomic status, riskier lifestyles and higher co-morbidities than private hospitals (Tynkkynen and Vrangbæk, 2018). Most healthcare deficiencies in the Czech Republic, Slovakia and Russia have links to risk selection by providers (Besstremyannaya and Simm, 2014). In New Zealand, private providers prioritized privately-funded patients over publicly-funded patients (Flood and Hardcastle, 2015).

Further, a two-tier system may promote inequity in healthcare delivery. For instance, Flood and Hardcastle (2015) found that low-income groups had poorer health outcomes because they were less likely to hold private insurance and use private hospitals in New Zealand relative to individuals of European descent and those living in more affluent neighbourhoods. In Australia, the ambiguous definition of private healthcare purpose has become detrimental to the financing structure (Duckett and Nemet, 2019). Private health insurance premiums have constantly increased as most people drop their private insurance coverage. Government subsidies and financial penalties have become less effective, leaving the system with inconsistencies in incentives, penalties and regulations – leading to greater inequity and some problems that started in the private sector spilling over to the public tier.

There is a threat of overregulation in a two-tier setup as the government seeks to control the private sector, which, in turn, imposes unnecessary costs on the system (Franz, 2016). This was the case in the Czech Republic, Slovakia and Russia. Due to insufficient public sector financing and excessive private sector regulation to control costs and risk selection, healthcare inequity remains high, and the quality of care is low (Besstremyannaya and Simm, 2014). Overregulation is usually a result of an attempt to deal with the incongruency of objectives, another threat in two-tier systems, between the private sector's profit motive and the public sector's low-cost objective. The Irish system has experienced this problem (Heavy, 2019). Inequalities persist, resulting in people paying more and waiting longer for some aspects of essential care (Burke, 2016), even in periods of economic recovery (Johnston *et al*., 2019).

There is also a risk of complexity, as seen in the French system, which rests on a diversity of institutions, policy mechanisms, and healthcare actors. This plurality has created an expensive, complex and fragmented system even with reforms that have enhanced the state's capacity to regulate the health sector (Nay *et al*., 2016). Ensuring equity and cost containment in an environment of contractual freedom has been challenging despite the superior healthcare administration capacity (Or and Pierre, 2020). The complexity may be worsened by a difference in capacity to attract resources between the private and public sectors, which often results in the private tier attracting all resources from the usually struggling public sector and critically reducing its capacity. This is usually the case when total healthcare capacity in terms of resources is limited, as was in China (Chen *et al*., 2020).

However, despite all these threats of two-tier setups, the single-tier setup proposed in South Africa is not without its issues. One major threat is the sufficiency of funds to support expenditure. Though celebrated for attaining universal health coverage, Taiwan's single-payer system faces challenges, including balancing the budget (Cheng, 2015). This has led to further challenges relating to improving healthcare quality and achieving greater cost-effectiveness in the healthcare system. Overfocusing on the budget has been detrimental to the quality of healthcare. A multi-payer setup could have been optimal. The Japanese experience in their healthcare system shows that it may be unavoidable to restructure it into a two-tier system to stop the expanding scope and size of insurance coverage. The single-tier policy has failed to limit the burden on the system (Asai *et al*., 2017).

Japan has recorded record highs in medical expenditure in a single-tier system for thirteen consecutive years. Healthcare spending is expected to amount to ¥54 trillion in 2025, a figure close to the ¥58 trillion total tax revenue in 2016 (Asai *et al*., 2017). This shows that universal coverage built on radical egalitarianism is unachievable. It cultivates too much burden on the NHI, making it unsustainable. Even in countries with good quality care, timeously getting care may still be impossible in a single-payer system. This has been the case in Canada with the waiting times and bureaucratic hassles experienced without private healthcare financing to supplement public financing (Yu and Zhang, 2017). A two-tier setup may fix some of the problems faced in single-tier systems, primarily if adequately structured and well-regulated.

Table 2. 3: Two-tier healthcare system threats

Author and country	Study objective	Risk/threats to NHIs
Besstremyannaya and Simm (2014) Czech, Slovakia and Russia	To examine the trends in the development of the Social Health Insurance systems	`Risk selection by providers and insurers and Overregulation as the government seeks to control the private sector
Flood and Hardcastle (2015) New Zealand	To draw lessons for the Canadian health system from New Zealand's two-tier healthcare system	Risk selection, physician-induced demand for private healthcare and promotion of inequality
Duckett and Nemet (2019) Australia	To examine the purposes of private insurance and provide a conceptual framework for government intervention	Private healthcare with an improperly defined purpose is detrimental to the financing structure of the whole system
Heavey (2019) Ireland	To describe the Irish healthcare system and how it has evolved to its current state of dysfunction	Incongruency of objectives between the private sector's profit motive and the public sector's low-cost objective
Or and Pierre (2020) France	To determine whether the two-tier system setup was the best for French healthcare	Expensive, complex and fragmented system due to diversity of institutions, policy mechanisms, and actors
Chen *et al*. (2020) China	To investigate the impact of capacity constraints on social welfare in a two-tier healthcare system	Reduction of public sector capacity as the private sector attracts resources away from the public sector.
Cheng (2015) Taiwan	To review Taiwan's single-payer NHI and draw any lessons for other nations	Insufficiency of funds and overfocusing on the budget that is detrimental to the quality of healthcare
Asai *et al*. (2017) Japan	To review the arguments against the introduction of a two-tier healthcare system in Japan	Radical egalitarianism may burden the national health scheme too much, making it unsustainable.
Yu and Zhang (2017) Canada	To compare and evaluate both single-payer, two-tier and insurance mandate health care systems	Long waiting times for everything - to get appointments with physicians, tests and surgeries.

Source: Author's own compilation (2022)

Overall, the studies reviewed highlighted various threats in a two-tier system. These include risk selection among providers (Besstremyannaya and Simm, 2014; Flood and Hardcastle, 2015), ambiguous definition of private healthcare purpose (Duckett and Nemet, 2019), overregulation of the system (Franz, 2016; Heavey, 2019), incongruency of objectives

(Heavey, 2019), risk of complexity (Or and Pierre, 2020) and capacity differences between public and private sectors (Chen *et al*., 2020). However, structuring the scheme as a single fund exposes it to other risks, chief among which is the insufficiency of resources (Cheng, 2015; Asai *et al*., 2017; Yu and Zhang, 2017). Without enough resources, the scheme faces threats to its successful implementation and sustainability. There is, thus, a need to evaluate whether the scheme is structured well enough to deal with these threats.

2.5 Provisions in the NHI to deal with systemic threats

The government is aware of the various threats facing the NHI; provisions have been made in the NHI white paper in anticipation of these threats. However, as specified above, the question lies in the sufficiency of the said provisions. In this section, that determination was made after identifying and describing what these provisions entail.

2.5.1 Provisions on the administration of the NHI

The government recognises mismanagement as one of the most identifiable factors contributing to poor healthcare quality in South Africa. This is encapsulated by the over-centralisation of public hospitals, with hospital managers having almost no authority. These hospitals are administered by provincial health department offices, which has led to the underdevelopment of management systems and capacity at the hospital level. Consequently, most hospital managers are demoralised, and the legitimacy and functioning of hospital boards have been undermined. Public accountability has also diminished. Specific provisions have been made in the NHI white paper to deal with issues of administration, as follows:

(i) The scheme will be a single fund publicly administered and established through legislation as an autonomous public entity, with the administration costs kept to a minimum. During the initial phase of implementation, additional resources will be required to set up the administrative structures and support operational systems. Its functions, roles and responsibilities, governance structures and accountability mechanisms will be specified.

(ii) The fund will take full responsibility for the pooling and disbursement of funds as a single purchaser to strategically purchase health services from accredited and contracted public and private providers. Administratively efficient systems and mechanisms will be implemented to ensure that all funds are appropriately channelled into the scheme as part of the broader pool for financing health services. This will eliminate duplicative administrative and benefit disbursement systems.

(iii) Central hospitals will be reformed to be semi-autonomous. This will require the prioritization of the full decentralisation of their management functions and responsibilities to ensure their effective functioning and sustainability. Their management will have full delegation and decision-making powers. This includes control over financial management, human resource management, infrastructure and technology, and planning and general decision-making.

(iv) District health management offices will be established to manage district health services. These will be structures to which management, planning and coordination of personal and non-personal health service provision responsibilities are delegated, considering national health policy priorities and guidelines and health needs in the district. The structure will consider the need to separate the function of purchasing personal healthcare services from the function of provision of health services.

2.5.2 Provisions on resources and infrastructure availability and distribution

A major characteristic of the health system is the fragmentation of funding pools. Its contribution to resources and infrastructure insufficiencies explains why it has received much attention. The private sector is highly resourced but benefits a minority of the population relative to the systematically under-resourced public sector. Small and fragmented risk pools and multiple funding pools also characterise medical schemes and the public sector, respectively. This contributes to uncertainty in the availability of funding for services. The fragmentation's effect is that most South Africans are not provided with adequate financial risk protection from catastrophic health expenditures, and their health needs are not adequately met. As such, provisions have been made as follows:

(i) A single funding pool will be used to support the strategic procuring of health resources – infrastructure and human resources - through properly articulated contracting mechanisms to supplement the government’s health services provision and delivery capacities. The fund will also help better and more effectively mobilise and control the critical financial resources in the health sector to enhance the under-resourced and strained public sector's strengthening.

(ii) It introduces ways of paying providers that will create appropriate incentives to promote the efficient provision of quality services. This includes the capitation payment for primary health care services and diagnosis-related group payments for hospital services, with comparable rates paid to public and private providers. Global budget caps will be introduced to accompany this to ensure that overall healthcare expenditure does not exceed available resources.

(iii) Mobilisation of funding resources will be undertaken by aligning the funds directed at medical benefits for compensation funds as indicated in the comprehensive social security review discussion document. A review of state subsidies to medical schemes will be undertaken. These subsidies will be reallocated into the fund. The fully established scheme will require supplementary funding mobilised through mandatory prepayment taxes.

(iv) Priority will be given to ensuring that good quality public health infrastructure with a consistent maintenance plan is available in facilities to improve health professionals working in rural and less affluent areas. To better utilise the available human resources, contracting private practitioners at the primary health care level will be strengthened. The expansion of contracted providers beyond general practitioners will also include various other specialists.

(v) The scheme will prioritise registration and identification of beneficiaries at the point of use to address the maldistribution of resources. Registration in catchment areas will consider various factors, including the size of the population in the area, disease profile of a catchment area, facilities and structures, health deprivation information and other contextual dynamics. Registered South Africans will be issued a card that will allow for collecting vital information to enhance policy response.

(vi) The World Health Organisation's Workload Indicators for Staffing Needs tool will determine staffing requirements for accomplishing defined tasks and ensuring a fair workload distribution. Incentives for attracting health professionals will be instituted. The intakes at local universities and colleges and platforms for international collaboration to rapidly produce specific categories of health professionals will be expanded to address the human resources gap.

2.5.3 Provisions on the two-tier healthcare system

The two-tier system has exacerbated the fragmentation of the healthcare system. It is seen as the primary contributor to inequity because it allows for the separate pooling of funds and resources between the rich and the poor. Further, it causes maldistribution of essential health resources, such as healthcare professionals, between the public and private sectors, urban and rural areas and rich and poor districts. In this regard, private medical schemes are seen as the conduits for this inequity and maldistribution, as only those belonging to the medical schemes can access health services in the well-resourced private sector. This is why the provisions in the NHI related to the two-tier setup are primarily aimed at changing how medical aid schemes operate in South Africa. The provisions have been set as follows:

(i) The scheme will create a unified health system by improving equity in financing by reducing fragmentation in funding pools, eliminating out-of-pocket payments and mandatory prepayment of healthcare. Regarding the latter, individuals will not be allowed to opt out of making the mandatory prepayment towards the scheme. However, they may choose not to utilise the benefits covered by the fund. This will ensure the cross-subsidization of healthcare needs across demographics.

(ii) The role that medical schemes will play within the scheme will change considerably. For the core objective of optimising available resources to be met, mechanisms will be implemented to ensure that people do not insure against the same healthcare costs twice. To this effect, medical schemes will work in tandem with the fund in streamlining covered healthcare entitlements and ensuring an alignment of the health benefits offered by the medical schemes and those covered by the fund.

(iii) As part of the transition process, medical schemes will play a supplementary role. Upon full implementation of the scheme, medical schemes will offer complimentary cover. This would include health services not fitting into the mainstream of medically necessary and efficacy-proven interventions approved for the scheme. Considering the disease burden and changing population demographics, there will be a complete overhaul to the prescribed minimum benefits regime.

(iv) When the scheme is fully implemented, it is anticipated that the number of medical schemes will reduce significantly. In addition, the state will identify all the funding for medical scheme contribution subsidies and tax credits paid to various medical schemes and reallocate these funds towards the funding required for the NHI. Such a move will render most small medical schemes unprofitable and unsustainable, reducing their numbers through merging.

2.6 Analysis of the sufficiency of set provisions to deal with threats to the scheme

The previous section details the provisions set in the white paper (2017) that are meant to deal with some of the noted threats to the NHI – administrative inadequacies, resources and infrastructure unavailability and poor distribution and the two-tier setup. This section determines the sufficiency of these provisions through a review that draws from the international literature.

2.6.1 Administrative provisions

Studies on NHIs administration revealed several threats. For instance, tension across healthcare levels can emerge in a decentralized system that lacks extensive collaboration (Philippon and Braithwaite, 2008; Yuan *et al*., 2017; Mossialos *et al*., 2017). Decentralization can also be a source of unsustainable delivery models and poor coordination (Martin *et al*., 2018). On the other hand, centralized systems expose NHIs to over-tampering by decision-makers (Philippon and Braithwaite, 2008) and are often inadequate in controlling costs and providers' behaviour (Ramesh *et al*., 2014; Huang *et al*., 2014; Cheng, 2015; Busse *et al*., 2017). Structural issues such as institutional separation (Buse *et al*., 2014; Lee *et al*., 2018), context (Atun *et al*., 2015) and divisional structures (Lancet, 2016; Ong *et al*., 2018) may also be a source of inadequacies.

The overarching provision for the scheme is that it will be a single centralized public entity. Centralization has its merits and demerits, some specific to South Africa. One of the merits is the promotion of efficiency through increased accountability, as reported in Australia (Philippon and Braithwaite, 2008). The South African system suffers from poor accountability mechanisms. Further, given the incompetence in decision-making at provincial and district levels in South Africa (Rispel, 2016), this insistence on centralization could help protect the scheme. The Canadian experience after assigning primary accountability to the provincial level to deal with various demerits of centralized healthcare is an excellent example of why centralization may be the best option for South Africa (Philippon and Braithwaite, 2008).

Opting for centralization seems to align with more international evidence that points out the risks posed by decentralization, such as the limited consideration of the impact of policy decisions on healthcare across all levels, like in Australia (Kickbusch and Buckett, 2010) and poor collaboration between different government departments and levels as in China (Yuan *et al*., 2017). Mossialos *et al*. (2017) highlighted the likelihood of a lack of extensive intergovernmental collaboration in a decentralized scheme, while Martin *et al*. (2018) found that decentralization was a source of unsustainable healthcare delivery models and poor coordination on the social determinants of health in Canada. Policies aimed at expanding the basket of services, the coordinated effort to reduce variation in healthcare outcomes and public engagement in system stewardship were also lacking

However, Philippon and Braithwaite (2008) noted that centralization exposes schemes to over-tampering by administrators, which introduces significant inefficiencies. In South Africa, the high level of centralization may also be unachievable. It requires realigning financial structures in provinces and districts to a unitary system. Yet, the differences in the pace of restructuring at the national level versus the provincial and district levels may be administratively incompatible and become a source of inefficiency in the NHI. Centralisation may also limit province and district-specific decision-making, which is not ideal for a scheme that seeks to push the country toward UHC. Unless there are mechanisms to eradicate those inefficiencies, limit over-tampering and ensure that province and district-specific decision-making is not limited, the provisions for a single fund may be inadequate.

As if to acknowledge the ills of over-centralisation, a decision has been taken to have semi-autonomous central hospitals and district health management offices. Essentially, this ensures the full decentralisation of central hospitals' management functions and responsibilities, thereby averting the threat posed by the lack of administrative specialization, as seen in South Korea (Lee *et al.*, 2018). Protecting this autonomy means national-level funding centralisation will not compromise provincial-level decision-making in financial management, human resource management, infrastructure and technology domains. Having district health management offices will also ensure that the management of service provision considers national policy priorities but remain district-specific. If these structures are adequately set up, having a centralised funding system may not be a disadvantage.

However, provincial and district structures to be developed to reduce the ills of centralised funding and control come with their threats to the same scheme. For instance, it is challenging to have congruent capabilities and structures at the national, provincial and district levels. Thus, according to Ong *et al*. (2018), the poor regional systems performance due to different capabilities and incongruent financing structures relative to the NHI will likely negatively impact the scheme's performance. Further, even if the threats of both centralisation and decentralisation are dealt with, there are other threats with which the scheme would have to contend. For instance, there is an inadequate provision for understanding providers' behaviour and controlling their actions, a major threat to sustainability, as noted in China (Ramesh *et al*., 2014) and Taiwan (Huang *et al*., 2014; Cheng, 2015).

A rigid structure in a centralised funding system coupled with a quasi-decentralised delivery model can lead to monopolistic inefficiencies and unsustainability. This is consistent with what Busse *et al*. (2017) noted in Germany. Other issues include the lack of multi-angular reforms, as the structure proposed makes it challenging to bring about reforms from different angles and the low capacity to learn from experiences, refine reforms and establish context-sensitive provincial and district approaches (Atun *et al*., 2015). Poor manageability of the scheme due to the lack of divisions in the healthcare system that allow for focus on different subpopulations (Lancet, 2016) and resource allocation and performance improvement problems (Dixit and Sambasivan, 2018) are the other risks to consider.

Table 2. 4 Merits and insufficiencies of administrative provisions

	Merits of the provision	**Insufficiencies**
The scheme will be a single centralized public entity	Will help address accountability absence and the incompetence in decision-making at provincial and district levels in the healthcare system	The provision for centralization exposes schemes to over-tampering by administrators, which introduces significant inefficiencies
	Enhances consideration of the impact of policy decisions across all levels and improves collaboration between different government departments and levels	The level of centralization envisaged may be unachievable as it requires realigning administratively incompatible financial structures into a unitary system.
	Facilitates the development of sustainable healthcare delivery models and improves coordination on the social determinants of health	Centralisation may also limit province and district-specific decision-making, which is not ideal for equity and equality in the healthcare system
Semi-autonomous central hospitals and district health management offices	Semi-autonomy in central hospitals and DHMOs enables full decentralisation of central hospitals' management functions and responsibilities	The ills of incongruent capabilities and financing structures at national, provincial and district levels may be introduced into the system.
	Reduction of funding centralisation effects on vital context-specific decision-making in domains such as finance, human resource and infrastructure	Erodes the holistic ability to understand providers' behaviour and control their actions, which is a significant threat to the scheme's sustainability.
	Facilitates the consideration of national policy priorities while remaining district-specific. This ensures that centralisation is not entirely a disadvantage.	A prescriptive centralised funding structure system coupled with a quasi-decentralised delivery model can also lead to monopolistic inefficiencies

Source: Author's own compilation (2022)

Table 2.4 above contains a summary of the provisions relating to administration, the merits and insufficiencies identified in those provisions. Highlighted in the table is that while setting up the scheme as a single centralized public entity and ensuring semi-autonomy in central hospitals and district health management offices has various merits, various issues render those provisions inadequate. Exposure to over-tempering by administrators, unachievability of the level of centralization due to administratively incompatible financial structures in provinces and districts to a unitary system and limitation of the province and district-specific decision-making, which is not ideal for equity and equality in the healthcare system due to centralization are some of the inadequacies of the NHI provisions.

2.6.2 Provisions on resources and infrastructure availability and distribution

Several studies have identified threats to NHIs related to the lack of resources and infrastructure, such as poor resilience to shocks (Nuti *et al*., 2012), inequity and inefficiency (Marten *et al*., 2014), insufficient protection of the insured population and inability to respond to changing needs (Kwon, 2018) have been reported. Regarding the skewed distribution of resources and infrastructure, threats such as effectiveness and sustainability (Shinjo and Aramaki, 2012), reduction in the contribution to equity (Liu *et al*., 2016), the prohibitive cost of care in poor areas and concentration of service in richer areas (Sun and Luo, 2017; Benatar *et al*., 2018), inefficiency (Herwartz and Schley, 2018)**,** poor response to changing needs (Yu *et al*., 2019) and poor capacity building (Zodpey *et al*., 2021) have also been reported. The sheer number of threats highlights the importance of resources in such schemes.

To ensure that enough resources are secured, the scheme provides a single funding pool to effectively mobilise and control vital financial resources in the health sector. Supplementary funding will be mobilised through mandatory prepayment taxes. A single funding pool would eradicate the inefficiencies resulting from fragmentation (Ngwaru *et al*., 2019; Michel *et al*., 2020; Atim *et al*., 2021). Mandatory prepayments for healthcare will also ensure that healthcare is free at the point of service. However, a single funding tool may be inadequate in raising enough funds to cover the demand expected in the scheme, primarily when services will be provided for free at the point of service. The government has also committed to providing a comprehensive benefits package which – although not yet defined – will add to the high cost of healthcare service provision.

The government intends to control expenditure by introducing appropriate ways of paying providers and using a global budget. It is accepted that the feasibility of the NHI is heavily dependent on cost control mechanisms and fiscal spending rules that can ensure that spending is proportional to the resources available (Omarjee, 2018). Using a blended payment approach with clearly specified risk-adjustment methods and benefits packages can help control costs (Hutchison *et al*., 2011; Boachie, 2014; Babashahy *et al*., 2017). This is because no single payment method is universally suited for all levels. Similarly, the global budget as an allocation strategy has been phenomenal in countries like Taiwan (Owili *et al*., 2019). Yip *et al*. (2019) noted that it helped prevent the Taiwanese scheme from collapsing from the overuse and overprovision of services.

However, blended approaches to payment and global budgets only work if there are enough financial resources, as these are just tools to help manage the available resources, not to create or secure more resources. In addition, the experience with the global budget in Taiwan shows that it can erode the gains of the health insurance system in terms of patient access to care (Owili *et al*., 2019; Yip *et al*., 2019). It can also lead to providers increasing their treatment intensities to boost their inpatient service volume, which is common in Taiwanese hospitals (Chen and Fan, 2015). As such, cost savings from the global budget disappeared while inefficiency increased in healthcare services. In the South African context, Omarjee (2018) argued that the lack of strict fiscal rules that link spending in the scheme to the available resources would cause a mismatch between funds and expenditure, even with a global budget.

There is also the provision for the reallocation of the medical tax credit. This means that more funds will go into the public sector. Further, this may help reduce the number of medical aid schemes as the profitability of the smaller schemes decreases (Michel *et al*., 2020; Atim *et al*., 2021). However, unsubsidised private medical aid may become unaffordable for most people who currently rely on private healthcare. This would cause those who cannot afford to move into the public healthcare system. As a result, this will leave the public system with more people to treat but without a commensurate increase in resources, worsening the pressure on the public health system (Serfontein, 2018). This is especially so if the increase in taxes is less than the amount people currently on subsidised medical aid are paying. By diverting some funds, the government may effectively drive away much more funds from the healthcare system.

Priority will be given to ensuring that good quality public health infrastructure with a consistent maintenance plan is availed in rural and less affluent areas. To further address the maldistribution of resources, the scheme will prioritise registration and identification of beneficiaries at the point of use. The WISN tool will determine the staffing requirements for accomplishing defined tasks and ensuring a fair workload distribution. These provisions aim to reduce regional unevenness and poor response to context-specific changing needs (Liu *et al*., 2016; Yu *et al*., 2019). However, as in the case of the payment methods and global budget, the distribution can only improve if the resources available increase. Mechanisms to improve resources and infrastructure distribution fail if they are not matched with an improvement in what is being distributed.

Table 2. 5 Merits and insufficiencies of resources and infrastructure provisions

	Merits of the provision	**Insufficiencies**
A single funding pool will be used to support the strategic procuring of health resources	Appropriate ways of paying providers with clearly specified risk-adjustment methods and the use of a global budget can help in controlling costs	Blended approaches and global budgets cannot create or secure more resources. They are also subject to manipulation by providers as resources are limited
	Eradication of funding pools fragmentation and mandatory prepayments will ensure the sufficiency of resources.	It may be inadequate in raising enough funds to cover services provided for free at the point of service and the comprehensive benefits package which
	A single fund allows for the effective control of key financial resources in the health sector to ensure that healthcare is provided free at the point of service	The lack of strict fiscal rules that link spending to the available resources will cause a mismatch between funds and expenditure, even with a global budget.
Various mechanisms will be employed to improve the distribution of infrastructure and resources	Employment of tools such as the WISN tool to determine the staffing requirements will ensure a fair distribution of the workload.	Such tools are ineffective in ensuring the availability of sufficient and skilled healthcare personnel that is requisite for any reform to succeed.
	The prioritisation of registration and identification of beneficiaries at the point of use in the scheme can help address resource maldistribution.	The distribution of resources can only improve if the resources available increase and the mechanisms to raise more funds are present.
	Reallocation of the medical tax credit means that more funds will go into the public sector while the number of medical aid schemes will reduce	As private care becomes unaffordable, mass migration to the public sector will occur without a commensurate increase in funds

Source: Author's own compilation (2022)

Table 2.5 above summarises some of the deficiencies in the provisions made to ensure the adequacy of resources and infrastructure. Of note, the government has not released all the information required to make accurate determinations of the affordability of the NHI. However, several attempts have been made, and the typical finding is that the scheme is unaffordable based on projections of prohibitive costs and low revenues. The poor distribution of resources is expected to catalyze the scheme's unsustainability. Thus, implementing the NHI could threaten any progress toward UHC, as seen in various European countries (Nuti *et al*., 2012). The insured population may also have insufficient protection from catastrophic healthcare expenditures, and the scheme may fail to respond to changing needs (Kwon, 2018). Inequities may be entrenched (Marten *et al*., 2014).

2.6.3 Provisions on the two-tier healthcare system set-up

The studies reviewed on two-tier healthcare systems revealed many problems that the NHI would face if it were to be implemented in a system with a two-tier financing structure. These include risk selection (Besstremyannaya and Simm, 2014; Flood and Hardcastle, 2015), incongruency of objectives (Duckett and Nemet, 2019; Heavey, 2019), fragmentation in financing pools (Or and Pierre, 2020) and public sector capacity reduction (Chen *et al*., 2020). Accordingly, the government has opted for a single fund established through mandatory prepayment. Individuals will not be allowed to opt out of making the mandatory prepayment towards the scheme, and the role that medical schemes will play within the scheme will change considerably; they will play a supplementary role which will turn to a complementary role upon full implementation of the scheme, medical schemes will offer complimentary cover.

These provisions may be advantageous and may help protect the NHI. For instance, if there is going to be only one purchaser of services on behalf of the whole population, the risk selection by both providers and insurers, as noted in the Czech Republic, Slovakia, and Russia (Besstremyannaya and Simm, 2014; Flood and Hardcastle, 2015), will be eradicated. The substantial differences in health levels across the population in South Africa promote risk selection. If South African citizens could buy the insurance and opt out of the NHI, the healthier and wealthier groups would go for private insurance and care. This would leave the NHI with the sicker and poorer portion of the population, with a low ability to pay but requiring healthcare services the most. Cross-subsidisation in the scheme would be crippled. Therefore, its eradication or reduction is essential for the sustainability of the NHI.

In the same vein, the overregulation of the private sector may be avoided. In a healthcare system with competing funding structures between the public and private sectors, the government may need to increase regulation of the latter to limit the incongruency of objectives between its profit motive and the objective of providing care at the lowest cost (Heavey, 2019). However, too much regulation as the government seeks to control the private sector activity introduces significant inefficiencies in the healthcare system (Flood and Hardcastle, 2015). In this regard, the South African government is seen as antagonistic to the private sector, while the government blames the private sector for unsustainable pricing in the healthcare sector. In a country with a healthcare system that fundamentally depends on the private sector, reducing its capacity through overregulation negatively impacts the whole system.

Creating a single fund is also a mechanism to limit the reduction of public sector capacity caused by the private sector's attraction of resources away from it (Chen *et al*., 2020). Often, the private sector has more capacity to utilise resources more efficiently, but its pricing is unsustainable (Barber *et al*., 2018). This is particularly common regarding human resources for healthcare (Peters *et al*., 2010; Rao *et al*., 2011). The South African healthcare system is not an exception in this regard (Barber *et al*., 2018; Bhayat and Chikte, 2019). However, through its ability to control the purchasing of services in terms of price – termed strategic purchasing of services – that comes from having a single fund, the government can protect the public sector capacity in terms of resources. According to Barber *et al*. (2018), prices are a key policy lever because the public and the private sectors draw on the same pool of resources.

However, in a single-tier healthcare system, there are threats with which the NHI would have to contend. For instance, a single fund is likely to face a shortage of resources to support healthcare expenditure, which would lead to an overfocusing on the budget. This was the case in Taiwan (Cheng, 2015). The South African public sector healthcare system is already starved of resources. Therefore, relegating the private medical aid scheme to a supplementary or complementary role may expose the scheme to funding deficiencies. Medical schemes may still play a role in the healthcare system because more resources can flow into the system if people are allowed to buy insurance (Ramjee *et al*., 2013; Ngwaru *et al*., 2019; Michel *et al*., 2020). It would be risky and imprudent for the government to constrain the private sector when it has not improved its capacity to secure enough financial resources.

Radical egalitarianism in countries such as Japan constricted private medical schemes and cultivated too much burden on the NHI. It has since become unsustainable (Asai *et al*., 2017).

Similarly, Canadians experience long waiting times due to the inadequately financed single fund (Yu and Zhang, 2017). In South Africa, this could be worse based on the level of deficiency in health and healthcare outcomes (Rispel, 2016). The government must determine whether limiting private medical schemes is worth the risk of running out of the necessary resources. For the provisions to be considered sufficient – limiting private medical aid schemes in favour of a single fund – they should be complemented by a description of how the government will raise additional resources. Unfortunately, most stakeholders are not convinced that the government can do that (Ngwaru *et al*., 2019; Mash, 2020).

Table 2. 6 Merits and insufficiencies of single-tier provisions

	Merits of the provision	**Insufficiencies**
A single fund with mandatory prepayment and no opt-out provision	A single fund means that risk selection by providers and insurers will be eradicated in the healthcare system. This would protect the scheme	A single fund will likely face a shortage of resources to support healthcare expenditure, which would lead to an overfocusing on the budget.
	A single fund is much more facilitative of the cross-subsidisation between the healthy and sick as well as between the poor and the rich	Radical egalitarianism may burden the national health scheme too much, making it unsustainable. This could worsen the challenges in the system
	A single fund is a mechanism to limit the reduction of public sector capacity caused by the private sector's attraction of resources away from it.	The protection of capacity is only possible when there are enough resources. If resources are insufficient, the scheme may be overburdened.
Medical aid schemes will play a supplementary role, turning into a complementary role.	Limiting medical schemes enables the scheme to control the purchasing of services which can protect the public sector's capacity.	Relegating the private medical aid scheme to a supplementary or complementary role may expose the scheme to funding deficiencies
	The supplementary and complementary role upon full implementation of the scheme will allow the scheme to adjust to the higher demand for healthcare	Limiting private medical aid schemes may reduce private sector providers' capacity, which many South Africans and the proposed scheme rely on.
	The costly and inefficient overregulation of the private sector due to the need to limit the effect of competing interests will be avoided.	A deficient legal and regulatory framework of the government action might cause costly and protracted legal battles that disturb the healthcare system

Source: Author's own compilation (2022)

Overall, some international evidence points out the risks that two-tier systems pose to NHIs. These studies, therefore, highlight the advantages of reconstructing the healthcare system, particularly the financing, into a single-tier system. However, there are disadvantages to operating a single-payer NHI, particularly in a resource-deficient country like South Africa, as summarised in Table 2.6 above. Even though operating as a single payer may be beneficial in controlling costs, there has to be a determination of the cost of the limitedness of resources to effectively, efficiently and equitably service demand. The same applies to the provisions for dealing with issues relating to resources and infrastructure availability and distribution and the scheme's administration. There are significant tradeoffs relating to these issues, and decisions taken at each stage of implementation should appreciate those tradeoffs.

2.7 Chapter summary and conclusion on systemic threats

This first analytical chapter in the pre-implementation evaluation of the NHI aimed to determine whether there were any systemic threats against the successful implementation and running of the scheme. This analysis drew from the concerns that, although the South African healthcare system is in dire need of reform, that reform would only be successfully implemented if the healthcare system at large is strong enough to house the scheme. That is, there is a possibility that the scheme may be implemented on a dilapidated foundation – the healthcare system – owing to some inadequacies that exist in the system. The scheme's failure would be catastrophic for the country, given the already appalling healthcare system. This chapter section reviews the objectives and the findings from the analysis.

2.7.1 Review of objectives

In examining systemic threats to the NHI, the focus was on poor government administrative capacity- mostly on administrative structures, lack of and poor distribution of resources and infrastructure across provinces and districts and the two-tier healthcare setup in terms of financing healthcare. The aim was to determine whether these three components constitute real threats to the NHI's successful implementation in South Africa. Subsequently, the provisions set in the scheme to deal with these three threats to its successful implementation were examined. The aim was to determine whether these provisions were sufficient to deal with the identified threats to the scheme. This relied on evidence from studies on the international healthcare system exploring the same aspects or aspects related to these threats and provisions.

For instance, with regards to administration, new administrative structures and supporting operational systems with clearly-stated functions, roles, responsibilities, governance structures and accountability mechanisms will be set up to run the fund – a publicly administered and autonomous public entity. Central hospitals will be reformed to be semi-autonomous, with prioritization of the full decentralisation of their management functions and responsibilities and district health management offices for the management, planning and coordination of district health services will be set up. For resources and infrastructure availability and distribution, provisions mostly referred to how having a single funding pool will help support the mobilisation of funding resources and the strategic procuring of health resources. The prioritisation of registration and identification of beneficiaries at the point of use would also help to deal with the maldistribution of resources. Regarding the two-tier setup, the government intends to create a unified health system by reducing fragmentation in funding pools.

2.7.2 Review of findings

Regarding the government's administrative capacity, the identified threats were mainly based on the healthcare system set up in terms of centralisation and decentralisation of tasks and decision-making authority. The government seem to have found a compromise between the two extremes – centralised financing of the scheme but with provincial and district-level structures to ensure a form of decentralised decision-making on issues on the ground. However, other issues are pending. These include the government's poor ability to understand providers' behaviour and control their actions, the monopolistic inefficiencies, the lack of emphasis on context-sensitive approaches to the management of healthcare and the poor manageability of the scheme due to the lack of divisions and specialization.

The threats resulting from resources and infrastructure unavailability and skewed distribution had more variability, ranging from poor sustainability, reduction in the equity contribution, the prohibitive cost of care in impoverished areas and concentration of service in more affluent areas inefficiency to poor response to changing needs and poor capacity building. Implementing the scheme as a single fund with mandatory prepayment taxes, a blended approach to payment of providers, and the global budget constitutes the government’s plan to overcome the threats relating to resources and infrastructure. However, there are limitations to some of these provisions. For instance, the success of the blended approach to payment of providers and the global budget depends primarily on the availability of the resources themselves. Unfortunately, the government has not been able to demonstrate its ability to secure enough funding fully.

Finally, regarding on two-tier healthcare system, the threats identified most related to risk selection, incongruency of purpose and objectives, fragmentation in financing pools and the reduction of public sector capacity. The response to these threats seems nested in why the government chose to implement the NHI as a single fund, established through mandatory prepayment, to finance a comprehensive benefits package. Individuals will not be allowed to opt out of making the mandatory prepayment towards the scheme to protect the scheme against risk selection. The role that medical schemes will play within the scheme will change considerably to supplementary at first and then complementary upon full implementation. Overall, the risk related to these three aspects seems robust and needs addressing by well-set provisions in the NHI. However, some of those provisions are deficient at best and need restructuring. There are, however, certainly some tradeoffs that would have to be considered in restructuring some of these provisions.

2.7.3 Conclusion on systemic threats to the scheme

The analysis of the possible systemic threats against the national health insurance – insufficient administrative capacity, unavailability and poor distribution of resources and infrastructure and the two-tier setup – suggest that the NHI, as currently conceived, is under significant threat. This is in line with various concerns that several healthcare stakeholders have raised over the recent years in the form of academic studies, news articles and submissions to the green and white papers on the national health insurance policy. For the government, the suggestions are straightforward. There is a strong need to reconsider some of the provisions set in the scheme to give it a chance to survive its first few years without running into sustainability issues. Provisions that ensure the establishment of proper systems of administration should be prioritised. The skewness in the availability and distribution of resources and infrastructure across provinces and districts should be eliminated through targeted policy and reform to ensure that the surface is even across all provinces and districts. The government may also need to reconsider allowing private medical aid schemes to operate alongside the scheme to fund healthcare with sufficient oversight. Relegating them to a complementary role may result in a lack of resources. The next chapter uses the case study of covid-19 to highlight the possible occurrence in case NHI is fully implemented by its deadline of 2025.

CHAPTER 3: THE CASE OF COVID-19 AND THE SYSTEMIC THREATS AGAINST THE SOUTH AFRICAN NHI

3.1 Introduction to the case of the covid-19 pandemic and the NHI

In the previous chapter, the focus was on the systemic threats the impending NHI faces. In this chapter, the evaluation focused on two systemic threats – resources and infrastructure availability and distribution and healthcare administration – using the recent outbreak of covid-19 as a case study. Specifically, this chapter aimed to examine the extent to which the covid-19 pandemic exposed threats to the NHI and increase the possibility of its successful implementation through lessons learnt. The rationale for this approach is that the burden accompanying the covid-19 pandemic possibly highlighted the need for universal healthcare, exposed the complications of universal health insurance and foreshadowed the pressure on the healthcare system once the scheme is introduced.

Further, some aspects of the pandemic, such as how it brought the private and public sectors together, the demands it put on administration and coordination and how resources and infrastructure insufficiencies were exposed, highlight its importance as a case study. This chapter is organized as follows. Section 3.1 provides the background, focusing on the case of the covid-19 pandemic in South Africa. Section 3.2 presents a description of materials and methods that broadly match the materials and methods employed in the previous chapter. Section 3.3 presents the results from a systematic review of the literature and a discussion of the findings, with a particular focus on how the pandemic increased the pressure on resources and infrastructure as well as healthcare administration. Section 3.4 concludes the chapter.

3.1.1 Background to the case of the covid-19 pandemic in South Africa

The ongoing covid-19 pandemic has become one of the greatest threats to global health. What began as an acute respiratory syndrome of unknown aetiology in Wuhan in December 2019 was soon declared a pandemic by the World Health Organisation in March 2020 (Cucinotta and Vanelli, 2020). By 31 December 2021, the world had seen over 289 million cases and 5.44 million deaths (Our World in Data, 2022). Despite its low case-fatality ratio, covid-19 had an enormous impact due to insufficient preparedness and global health systems' vulnerabilities to pandemic threats (Bollyky and Patrick, 2020). It also underscored several truths about pandemics and revealed significant shortcomings in current global and national capacities to prepare for, detect, and respond to them. This is despite emerging and re-emerging infectious disease pandemics being inevitable and predictable (Morens *et al*., 2004).

Further, the impact of the virus was driven by its rapid and widespread transmission (Wang *et al*., 2020). Thus, in addition to the challenges in the diagnosis, quarantine and treatment of suspected or confirmed cases (Dzieciatkowski *et al*., 2020; Magno *et al*., 2020), the pandemic came with a high burden on the functioning of the existing medical system and an overload on healthcare professionals, who were at a very high risk of infection (Muller *et al*., 2020; Haleem *et al*., 2020; Shaukat *et al*., 2020). Patients with other diseases and health problems were getting neglected as all the attention shifted toward covid-19 (Abdela *et al*., 2020; Haleem *et al*., 2020). The poor infection controls worsened this impact in most healthcare systems (Wang *et al*., 2020). This is because a pandemic of the magnitude of the covid-19 had not been experienced in most countries, and, therefore, there was no need to have robust infection controls in place.

South Africa was one such country for which poor infection controls became costly, especially compared to other African countries. As of 31 December 2021, of about 9.76 million cases and 228 453 deaths reported on the continent, approximately 3.46 million cases and 91 145 deaths – over 35 percent of cases and nearly 40 percent of deaths – were from South Africa (Our World in Data, 2021). Of note, all these figures could be very conservative estimations because of limited testing and challenges in attributing the cause of death (Ioannidis, 2021). Nevertheless, considering that the South African population of approximately 60 million is a small proportion of the African population of approximately 1.4 billion (Worldometer, 2022), such infection and death rates were significantly concerning, even with poor reporting and testing on the continent taken into consideration.

The statistics from the Africa CDC (2021) and the NDoH (2021) indicate that by December 2021, South Africa had experienced four waves of infections fuelled by different variants of the virus that emerged. These waves forced the government to tighten lockdown restrictions, which took a toll on South Africa's struggling economy. With a high prevalence of HIV and TB and signs of unreadiness in the country, a much higher case-to-fatality ratio (Academy of Science of South Africa, 2020) and a crumbling healthcare system were expected (Keene *et al*., 2020; Tamuzi *et al*., 2020). The statistics in Figure 3.1 below confirm the case-to-fatality ratio expectations; the ratio was lower than the African average from the day the first case in South Africa was reported. However, it went above on the 178th day and above the world ratio a couple of months later. It has remained there 381 days later (Our World in Data, 2022).

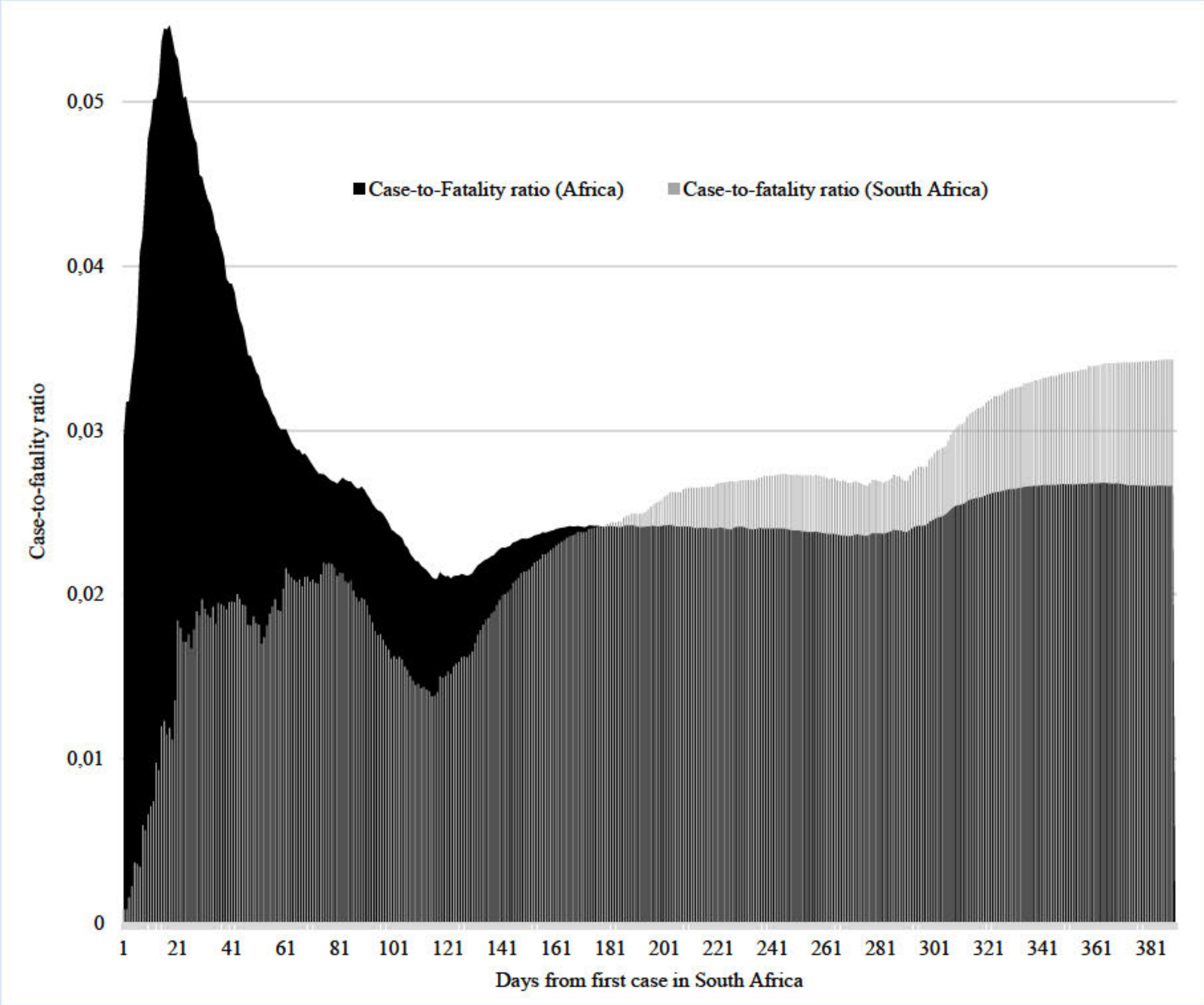


Figure 3. 1 Case-to-fatality ratio in South Africa and Africa

Source: Our World in Data (2021)

South Africa has a better-endowed healthcare system than most African countries; most African governments have failed to prioritise health systems, so they faced constraining preconditions regarding healthcare capacities which hindered required countermeasures in the fight against covid-19 (Wadvalla, 2020; Schlüter *et al.*, 2021). However, the structure of the South African healthcare system and the quadruple disease burden, in general, exposed the country to a more significant impact of covid-19. The disruption to routine, essential healthcare services was significant (Hofman and Madhi, 2020). Initially, South Africa managed to cope with the pandemic notably well (Stiegler and Bouchard, 2020). Implementing various levels of lockdown restrictions to control transmission afforded the authorities enough time to prepare for one of the biggest challenges to its healthcare system that was looming (Makoni, 2020).

The preparation included the designation of hospitals for managing the covid-19 cases, building emergency hospitals and sourcing equipment (Nyasulu and Pandya, 2020). However, these measures soon became inadequate as the first wave intensified due to the speed with which infections spread. Even countries such as Italy, Sweden and Spain with advanced healthcare systems also struggled immensely with managing the pandemic (Nacoti *et al*., 2020; Yan *et al*., 2020; García-Basteiro *et al*., 2020). Restrictions on vital economic activity brought a considerable cost to an already struggling economy, with the loss possibly far outweighing the benefits of fewer infections (Arndt *et al*., 2020). This begs the question of whether more effective and less costly manageability of covid-19 could have been realised had South Africa, despite its spreading speed, had a more robust healthcare system than it currently has.

Since the end of apartheid in 1994, South Africa has had the opportunity to work towards universal health coverage by introducing a national healthcare financing scheme. However, nearly three decades later, the South African healthcare system remains poorly structured and vulnerable to shocks such as the covid-19 pandemic (Ayomitunde *et al*., 2020). All the country has is a legacy of failed healthcare system typified by various inequalities, albeit trying to get one that meets the needs of all South Africans (Burger and Christian, 2020). This poor stewardship forced the government to institute very stringent lockdown restrictions – perhaps too stringent compared to what they would have had to institute if the healthcare system had been robust. However, the economic cost of the stringent restrictions was significantly high (Rispel *et al*., 2021; Gebremeskel *et al*., 2021).

The difficulty in choosing between the health system and the economy is highlighted by the survey conducted by StatsSA (2020), as presented in Figure 3.2 below, on the concerns about the impact of the pandemic. As much as 93 percent of the respondents were either very worried or extremely worried about the possible economic collapse. This was much higher than the concern about own health (60 percent) or the health of a household member (68.2 percent) but much closer to the concern about the healthcare system (88.2 percent) and the health of vulnerable people (88.9 percent). Although this survey was not conducted using policymakers as respondents, and even with the limitations that it is based on a non-probability, convenience sample, and people with access to technology, it still gives some insight into the impact of the pandemic in the country. It may have formed the basis for many policy decisions.

The concern for the economy and the health system, and the apparent deficiencies in the healthcare system, meant that massive amounts of resources had to be mobilised quickly to manage the pandemic. This was especially so because the trends in the infection rates seemed unrelenting. The same resources were needed to overcome financial losses due to loss of production and provide social protection to the poor as the pandemic raged on (Nyasulu and Pandya, 2020). To this end, the IMF approved US$4.3 billion in emergency financial assistance under the Rapid Financing Instrument to support South Africa's efforts in addressing the pandemic (International Monetary Fund, 2020). Although quite helpful, the loan was not enough. Moreover, securing financial resources through loan facilities did not insulate the South African healthcare system from its structural challenges (Nyasulu and Pandya, 2020).

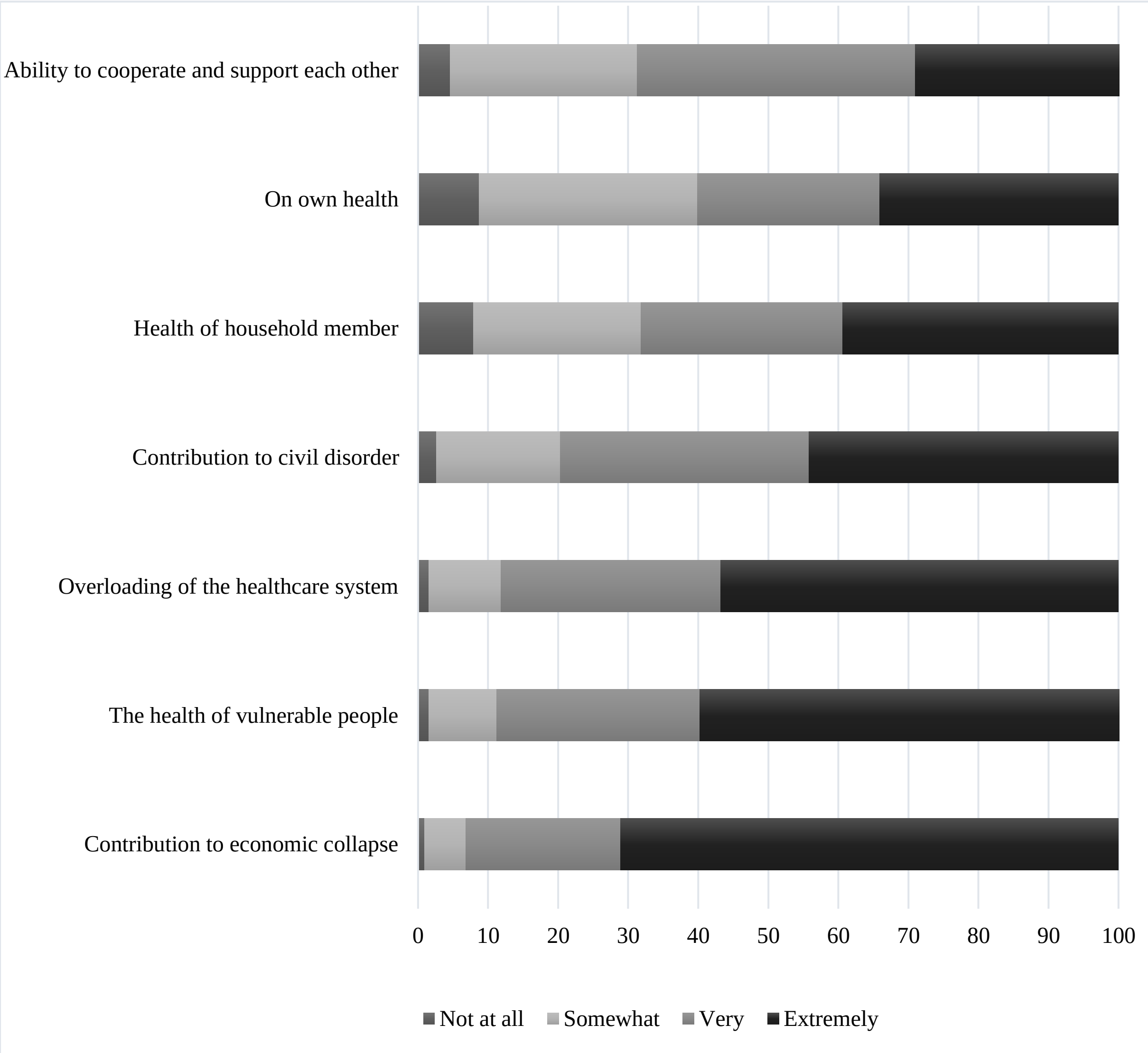


Figure 3. 2 Concern about the impact of the coronavirus pandemic

Source: Statistics South Africa (2020)

Thus, the covid-19 pandemic also exposed significant weaknesses in the healthcare system that require more than just loans to address (Hofman and Madhi, 2020). More concerning, however, is the misuse of funds. Various scathing reports revealed corruption in all aspects – the distribution of food parcels, unemployment grants, small business and farmers' support and the procurement of personal protective equipment (Maseko, 2020; Mbunge, 2020). In response, the Government of South Africa (2022) took measures, including the asset forfeiture unit's pursuit of the freezing of orders, issuance of regulations by the national treasury on procurement, auditing of claims submitted to the department of employment and labour, special audits of the covid-19 funds by the auditor general and authorisation of the special investigating unit to investigate any unlawful conduct in any matters relating to the pandemic.

However, the covid-19 relief package landed in an environment with many control weaknesses (Auditor General of South Africa, 2020). As such, most of these measures taken by the government were barely adequate (De Villiers *et al*., 2020). These events may be predictive of what would happen under the scenario of the NHI if it is not carefully planned. Yet, a case can be made for some benefits that the pandemic may have brought about, albeit inferior in magnitude to the losses it caused. For instance, the pandemic revealed some structural inadequacies in healthcare systems, even globally (Shamasunder *et al*., 2020; Ozili, 2020). Specifically, the pandemic validated the emptiness of the global health rhetoric of equity, the flaws of a health security-driven global health agenda, and the negative health impacts of power differentials (Shamasunder *et al*., 2020).

This experience is invaluable in designing future healthcare policies and creating more resilient healthcare systems to deal with emerging and re-emerging pandemics at local and global levels. The pandemic also highlighted the dangers of failing to eradicate inequities and inequalities in access to quality healthcare (Metzl *et al*., 2020). Non-discriminatory nature of the pandemic in that it was not limited to those without access to quality healthcare has strengthened the case for cross-subsidisation of healthcare needs as a principle to be upheld in healthcare policies and systems. Related to the principle of cross-subsidisation, the pandemic's intense demand and pressure on resources caused an improvement in the collaboration between public and private healthcare sector actors as custodians of the healthcare system in most countries (Baxter and Casady, 2020; Tan *et al*., 2021; Casady and Baxter, 2021).

For South Africa, this collaboration could pave the way for harmonizing the two sectors in the NHI. The private healthcare sector has always seen the government as antagonistic in its attitude towards them (Booysen and Hongoro, 2018; Matthew and Mash, 2019). Therefore, in designing its policy response to the pandemic, the government had an opportunity to improve its relationship with the private sector and ensure a more stable foundation for the impending NHI. Finally, the pandemic represents an opportunity for the government to demonstrate the political will to reform healthcare, an aspect the government has always been accused of lacking (Mayosi and Benatar, 2014). Accordingly, this chapter aimed to explore the systemic threats identified in the previous chapter, using covid-19 as a case study.

As shown in the previous two chapters, NHIs are essential for UHC (Bazyar *et al*., 2021). However, in South Africa, the NHI faces significant threats to its implementation, primarily due to poor government administrative capacity and the lack of and poor distribution of resources and infrastructure. Just like the covid-19 pandemic, the scheme will bring an enormous demand for services that may not be met if the threats to its implementation are valid and are not dealt with first. The pandemic provided a perfect case to assess the possibility of implementing the scheme. This includes a test of the validity of the systemic threats against the scheme, the provisions for dealing with the systemic threats, and a determination of whether the pandemic would have been managed better had an NHI been in place.

3.1.2 Problem statement on the case of the covid-19 pandemic and the NHI

The covid-19 pandemic had an immense effect on global health systems as an enormous surge in demand for resources, specialised infrastructure and administrative structures accompanied it. For South Africa, the added burden from covid-19 could be a foretaste of what to expect once the NHI is fully implemented due to its incremental effect on health-seeking behaviour. Further, the systemic challenges in dealing with covid-19 may have highlighted the need for reform, thus underlining the rationale for introducing the NHI. However, the same challenges may have underscored how the NHI’s successful and sustainable implementation may not be possible in its current proposed form on such a derelict foundation. Accordingly, this chapter employed the case of the covid-19 pandemic as part of the pre-implementation evaluation of the NHI, with a focus on systemic threats identified in the previous chapter.

3.1.3 Research aim and objectives on the case of the covid-19 pandemic

The second objective of this study, as indicated in section 1.3 of Chapter 1, was to examine the extent to which the covid-19 pandemic exposed threats to the South African NHI and increased the possibility of its successful implementation. This chapter aimed to achieve this objective by exploring the following specific objectives:

- determining how the covid-19 pandemic could have been managed better under the NHI
- determining how the covid-19 pandemic highlighted systemic threats to the NHI
- examining how the covid-19 pandemic may have increased the possibility of NHI success

The study relied on a systematic review of published literature on the experience of the added burden and pressure on the healthcare system from the covid-19 pandemic in the South African healthcare system to achieve these objectives. Given the provisions and a description of what the NHI would entail in the white paper (2017), it was possible to determine the implications of that experience for the scheme. In the previous chapter, evidence was provided regarding the extent of the threats posed to the NHI. Herein, the aim was to determine the extent to which the covid-19 pandemic exposed some of those threats to the NHI.

3.2 Materials and methods of analysis in the case of the covid-19 pandemic

Consistent with the previous chapter, a systematic review of the literature was conducted herein to examine how the South African healthcare system managed the pandemic in light of systemic inadequacies. As noted, systematic reviews are methodical collection, evaluation and synthesis of empirical study findings to provide a summary of evidence relevant to answering a set of questions (Schmutz *et al*., 2019). In this case, the questions related to the extent to which the covid-19 pandemic exposed the threats to the NHI and the degree to which it increased the success of implementing the scheme by providing lessons, pointing out areas that need improvements and exposing weaknesses in the suggested framework. Examining these issues from the experience with the pandemic could determine whether the scheme will succeed in bringing about the necessary change in the health system.

Evidence gathering in healthcare is vital, and systematic reviews contribute immensely to those efforts (Govere and Govere, 2016; Keel, 2017; Barasa *et al*., 2018; Granja *et al*., 2018; Fatima *et al*., 2019; McCartney *et al*., 2019). This importance is heightened when there is a pandemic such as influenza (Saunders-Hastings *et al*., 2017; Pasquini-Descomps *et al*., 2017; Ahmed *et al*., 2018), Ebola (Al-Garadi *et al*., 2016; Wong *et al*., 2017; Abramowitz *et al*., 2018) and Zika (Depoux *et al*., 2018; Kobres *et al*., 2019; Musso *et al*., 2019). These reviews focus on various aspects of a pandemic, and this wide-ranging applicability renders systematic reviews particularly useful. Also, during pandemics, an unmanageable amount of information is produced in the healthcare system. Without systematic reviews to efficiently integrate this information to aid decision-making, it may overwhelm policymakers (Moosapour *et al*., 2021).

It is, thus, not surprising that various systematic reviews have already been conducted on the covid-19 pandemic as there is a strong emergency to get it under control in healthcare systems as one of the deadliest pandemics in the recent past (Krishnamoorthy *et al*., 2020; Xie *et al*., 2020; Jessop *et al*., 2020). The speed with which it has spread across the globe, its rate of mutation to produce more dominant variants such as the Delta and the Omicron and how this has impacted healthcare systems have cultivated the need for evidence-based decision-making (Pacheco-Barrios and Fregni, 2020; Bastani *et al*., 2022; Vickery *et al*., 2022). In addition, there are many unknowns regarding the virus, which is not ideal for the very costly fight against the pandemic (Luo, 2021; Mohamed *et al*., 2022). This section describes the search strategy for articles, the inclusion and exclusion criteria and the analytical procedure employed.

3.2.1 Search strategy for journal articles on the covid-19 pandemic in South Africa

As noted in the previous chapter, the first step in a systematic review of literature is the search for relevant studies to review. It highly depends on the search tool used (Ferreras-Fernández *et al*., 2016; Eriksen and Frandsen, 2018). In this regard, various search tools can be used to ensure that the studies selected for review and analysis are relevant. These include PICO (Eriksen and Frandsen, 2018), SPIDER (Cooke *et al*., 2012) and SPICE (Booth, 2006). However, most of the aspects of the search tools were inapplicable to the studies needed to examine the case of the covid-19 pandemic and the systemic inadequacies. Therefore, the search centred on the SPE format – Setting (South African healthcare system), Phenomenon of interest (Covid-19 pandemic) and Evaluation (Administration, resources and infrastructure inadequacies) – and subsequent snowballing to guide the search.

The SPE model helped isolate the South African healthcare system, thus allowing for a thorough examination of the contextual issues. The format also allowed for the focus to be on the covid-19 pandemic effects in the country, how it was managed and its implications for the impending NHI. Based on the timing of the pandemic and the demand it has placed on the healthcare system in terms of resources, infrastructure and administrative structures, its relevancy in future healthcare policy is apparent. Finally, as part of a study focusing on the pre-implementation evaluation of the NHI, it was pertinent to focus on the studies that also evaluated the administration, resources and infrastructure adequacies and inadequacies in

South Africa. Evaluative studies produce a policy-relevant description of a problem, the alternative solutions and critical implementation considerations (Moat *et al*., 2013).

Three separate searches – for administration, resources and infrastructure – were run separately using PubMed, Econlit, EbscoHost, Google and Google scholar search engines to access the articles needed for the three aspects. The goal of using different search engines was to ensure that a substantial sample of relevant studies was found, as rigorous evidence identification is essential for systematic reviews' outcome, validity, and explanatory power (Gusenbauer and Haddaway, 2020). Further, different search engines possess varying precision, recall and reproducibility levels. Thus, their usability in systematic searches varies (Cooper *et al*., 2018). Without evidence on which one is the most appropriate, using an assortment of these search engines complementarily was necessary (Gusenbauer and Haddaway, 2021). Thus, the searches based on the SPE search format were run as follows:

- Search 1 - "Administration + South African Healthcare System + Covid-19"
- Search 2 - "Resources + South African Healthcare System + Covid-19
- Search 3 - "Infrastructure + South African Healthcare System + Covid-19"

The separation of the searches into three groups, just like in Chapter 2, was to ensure a higher level of comprehensiveness and representativeness of studies identified, which, according to Harari *et al*. (2020), influences the quality of conclusions. A time limit was not applied as the pandemic only started towards the end of 2019 and is currently ongoing. Therefore, the study population was likely to be limited to that period. Besides specific studies that examined the South African experience in the covid-19 pandemic, some international studies were included to provide explanations and support for observations in the South African context. Snowballing based on the reference lists of identified studies was also used to increase the number of relevant studies from the population of articles written on the covid-19 pandemic.

Subsequently, inclusion and exclusion criteria were applied to the population of studies. This is critical for systematic reviews as it enhances the relevance and validity of the study as the best possible sample of studies end up being reviewed (Randolph, 2009; Patino and Ferreira, 2018; Connelly, 2020). Accordingly, studies included in this analysis were first screened using a specific criterion. They had to contain information about healthcare administration and resources or infrastructure distribution and availability to be part of the sample to ensure that the analysis remains focused on those systemic threats for a thorough examination. Further, any evidence on administration, resources and infrastructure issues in South Africa had to refer to the covid-19 pandemic for the studies to be included. This is because the pandemic was adopted as a case study to analyse the systemic threats to the scheme.

They also had to be published articles, working papers or government policy documents rather than theoretical/conceptual papers. Empirical research is based on observed and measured phenomena and derives knowledge from experience (Barasa *et al*., 2018). This insistence was based on the realisation that evaluative empirical studies are more relevant for a case study such as the one on the covid-19 pandemic (Moat *et al*., 2013). Documents not written in English, only available as abstracts, as well as letters, editorials, and commentaries, were excluded from the study. Further, documents without any mention of any formulations of the phrase 'covid-19' in the text were considered irrelevant and, therefore, excluded from the study. After the inclusion and exclusion criteria were applied, the remaining studies were assessed and appraised for quality.

3.2.2 Quality appraisal of sampled studies

Following the inclusion and exclusion criteria applied to the population of documents accessed via the searches, the CASP tool, described in Section 2.3.3, was used to appraise the quality of the studies selected into the sample to ensure reliability. This tool employs a checklist approach with screening questions to assess the adequacy, trustworthiness and relevance of the evidence reported in the articles (CASP, 2017). The questions, which have to be answered in the affirmative, included some that interrogated the clarity of the research aims and the aptness of the methodology, research design and recruitment strategies. Inquisitions about data collection procedures, relationships between the researcher and the participants and ethical issues are also included. Finally, the robustness of the data, clarity in the statement of findings and valuableness of the research were also considered.

Once a study satisfied this criterion, it was included to provide evidence in examining the South African experience in dealing with the covid-19 pandemic in light of the two significant inadequacies in the healthcare system. Figure 3.3 below shows that the initial search and snowballing yielded a sample of 301 articles. A total of 119 documents remained after removing 11 duplicates and the irrelevant documents after the abstracts were read for further screening. Subsequently, 63 documents remained after the second review of the 119 documents. Finally, the CASP tool was used for further screening, and a sample of 48 articles was found to be of good quality and was, therefore, included in the study for analysis. These were deemed enough for this analysis based on several past studies that have employed systematic reviews of the literature (Moraros *et al.*, 2016; Antony *et al.*, 2018; Al-Habib, 2020).

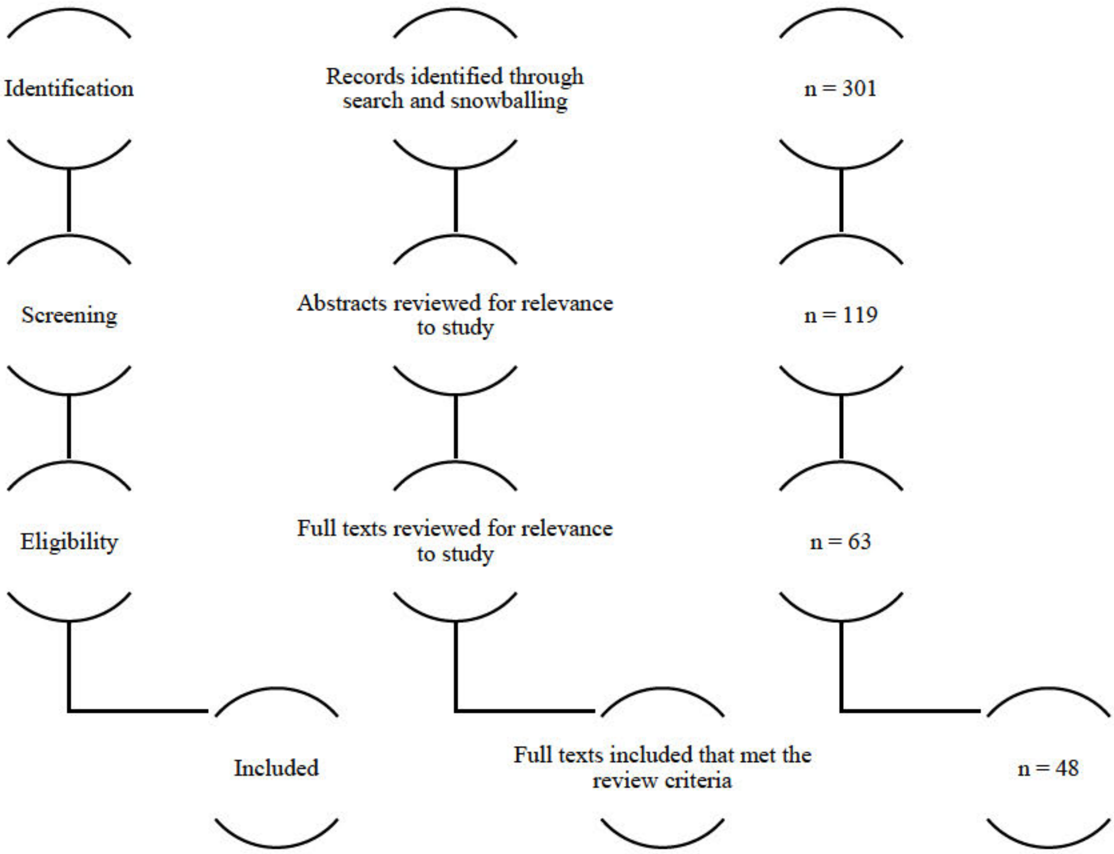


Figure 3. 3 Chosen studies on the case of the covid-19 pandemic
Source: Own depiction (2022

3.2.3 Analytical procedure

After the quality appraisal, the text from the sample of 48 articles was extracted under the supervisor's full supervision to improve the process's trustworthiness. A data extraction form was used, which, according to Shokraneh and Adams (2017), helps reduce the number of errors and data wastage in the extraction. It was imperative not to waste data, given the few relevant studies. The data was then imported into the NVivo qualitative data analysis software program (QSR International, 2020). Following the importation into NVivo, the documents were organized according to their bibliographical information. According to O'Neill *et al*. (2018), this step enables the creation of a snapshot of all literature entries. The snapshots allow for a quick review of the literature that has been collected and the determination of whether there is a need to broaden or narrow any subsequent searches.

In addition, the snapshots identify keywords and topic sentences in the literature, which are particularly relevant in identifying themes (Wilk *et al.*, 2019). Subsequently, visualizations based on the NVivo functionality to search across the data for specific query phrases, words, or broad terms enabled the exploration of patterns, trends and connections within the literature. As in the case of the snapshots, visualizations can provide a snapshot of what is present across the data and, equally importantly, suggest what is missing (Jackson, 2015). The analysis also entailed a conventional inductive content analysis, a technique used to identify themes by studying documents (Elo and Kyngäs, 2008). The inductive approach was preferred because the analysis sought to answer specific research questions rather than assess a theory (Graneheim and Lundman, 2004).

The first question was on how the covid-19 pandemic could have been managed better under the NHI. Answering this question relied on identifying themes relating to inadequacies that could have been addressed by reforming how healthcare is financed. The second question was on the extent to which the covid-19 pandemic highlighted the threats to the impending NHI. In this regard, the focus was on the themes that pointed out any inadequacies relating to these administration, resources and infrastructure during the pandemic. Finally, the third question focussed on the degree to which the pandemic increased the success of implementing the scheme by providing lessons, pointing out areas that need improvements and exposing weaknesses in the suggested framework. Any themes relating to healthcare policy design and implementation were identified to answer this question.

3.3 Systematic review of literature on systemic threats and the covid-19 pandemic

As alluded to above, this chapter aimed to determine the extent to which the covid-19 pandemic highlighted the poor administrative capacity of the government and the inadequacies in the availability and distribution of resources and infrastructure as a threat to the NHI. The overarching assertion is that the additional burden on the healthcare system that came with the pandemic could be an indication of the pressure that the healthcare system will experience once the NHI is rolled out nationally. Further, the chapter sought to determine whether having the NHI in place could have led to a better response to the covid-19 pandemic relative to the current response. This section discusses the evidence from a literature review on the covid-19 pandemic in South Africa, with a focus on the covid-19 pandemic pressure on resources and infrastructure and healthcare administration capacity.

3.3.1 Analysis of the covid-19 pandemic pressure on resources and infrastructure

South Africa has been one of the worst affected countries by the covid-19 pandemic on the continent, and this culminated in the declaration of a national state of emergency (Mbunge, 2020; Dzinamarira *et al*., 2020; Salgotra *et al*., 2020). With rapidly increasing cases and seemingly no path to approved vaccines, the government had to implement strict anti-transmission measures, in addition to the WHO and Africa CDC recommendations, to protect the vulnerable healthcare system (Lone and Ahmad, 2020). However, despite these measures taken by the government, there is evidence of immense pressure on resources and infrastructure due to the pandemic that the South African healthcare system faced. Elements such as limited hospital infrastructure and hospital beds, shortage of healthcare personnel, limited laboratories and inadequate testing and other pre-existing system problems are explored in this section.

(i) Limited hospital infrastructure and hospital beds during the covid-19 pandemic

Among all the inadequacies highlighted by the covid-19 pandemic, limited hospitals and hospital beds were the most apparent. Initially, there were delays in creating designated covid-19 areas in hospitals due to the lack of space (Thomas *et al*., 2020). Most hospitals also lacked on-site diagnostic testing infrastructure, so all samples had to be referred to the reference laboratory. This led to delays in test results and challenges in treatment and patient management. Intermittent supply and shortages of viral test kits once testing in the institution had commenced also significantly affected managing and reporting covid-19 results to patients or healthcare workers (Wadvalla, 2020). It is easy to see why the number of hospitalised patients suspected of having covid-19 grew to such an extent that more wards needed to be opened to accommodate them.

The inadequacies in the hospitals saw slowing patient flow in and out of the hospitals, increasing personal protective equipment usage, further demand on beds – including intensive care units – and, ultimately, sub-optimal management of patients. In response, the government purchased intensive care capacity from the private sector (Waitzberg *et al*., 2021). However, this was not a cost-effective investment (Cleary *et al*., 2021). Also, the combined intensive care unit capacity of the public and private sectors was estimated to be only 3340 before the covid-19 pandemic took hold (Nichols *et al*., 2021). The estimates at the time suggested the availability of 0.1 to 2.5 intensive care unit beds per 100 000 population (Turner *et al*., 2019). As of June 2020, the intensive care unit was already at capacity in some provinces and projected to be overwhelmed in some weeks that followed (Low, 2020).

Further, in some provinces, intensive care unit capacity was expected to be breached for between three and six months between June and December 2020 by a factor of 6–10 (Silal *et al*., 2020). These projections were based on surges in cases in provinces such as the Eastern and Western Cape. The suggested use of remdesivir and dexamethasone to free up the intensive care unit capacity could not be operationalised as both drugs were significantly inaccessible in the country (Nichols *et al*., 2021; Jo *et al*., 2021). These developments helped to highlight how much the South African healthcare system lacks in terms of infrastructure, which could be a significant threat to the NHI as free healthcare services at the point of service may cause a considerable shift in demand for infrastructure. On the other hand, by highlighting the need, the pandemic may have increased the vigilance of policymakers in their planning for the NHI.

(ii) Shortage of healthcare personnel during the covid-19 pandemic

Another inadequacy exposed by the covid-19 pandemic is the lack of healthcare personnel at all levels of care in South Africa. This contributed immensely to the delay in the designation of covid-19 areas and hospitals and, possibly, the sharp increase in infections (Thomas *et al*., 2020). Further, international data shows that about 20 percent of hospitalised patients with confirmed SARS-CoV-2 pneumonia develop acute respiratory distress syndrome, and approximately 12 percent need intubation and mechanical ventilation (Richardson *et al*., 2020; Wang *et al*., 2020). However, the capacity to treat such patients was severely constrained in South Africa due to a lack of dedicated staff for such high-level care and procedures that came with it (Mendelson *et al*., 2020). Yet, early planning for the dramatically increased intubation requirement is critical to managing covid-19 in healthcare facilities.

The lack of dedicated staff also explains the poor integration of palliative care into all covid-19 healthcare facilities (Mendelson *et al*., 2020). This goes against WHO's emphasis on the importance of palliative care in global guidelines for responding to infectious disease outbreaks, particularly ones like covid-19 (de Boer *et al*., 2021). All this lack meant that junior doctors' responsibilities increased significantly with the pandemic (Coughlan *et al*., 2020; Joseph *et al*., 2021; Spiers *et al*., 2021). Quite a considerable number of junior doctors had to be brought on board as the pandemic raged. However, an examination of junior doctors' preparedness revealed significant inadequacies. This was mainly in triage decision-making and critical care management outside the intensive care unit, which was pertinent when the pandemic was not yet under control (Ahmed and Davids, 2021).

A noted and innovative, multi-sectoral and comprehensive provincial response to the pandemic addressed the dual challenge of saving lives and the economy. However, the response was still inadequate due to a chronic under-investment and insufficient focus on the health workforce (Rispel *et al*., 2021). Most of the measures that could have helped to get the pandemic under control required significant numbers of healthcare personnel. Given that the NHI requires nearly three times the number of currently available doctors for it to function smoothly, the pandemic may have highlighted why introducing the scheme that would lead to greater health-seeking among South Africans can be catastrophic. However, the pandemic may have also highlighted some areas in need of human resource capacitation, such as laboratory and testing personnel, which could help in human resource planning for the NHI.

(iii) Limited laboratories and inadequate testing

The pandemic also exposed inadequate laboratory services and testing related to infrastructure and personnel. Mendelson *et al*. (2020) noted a significant shortage of qualified staff for the SARS-CoV-2 RT-PCR diagnostic tests. This significantly affected laboratory service productivity, especially regarding turnaround times. Yet, as was apparent during peak infection periods, rapid turnaround time is critical in managing covid-19 and triage through the hospital (Tromberg et al., 2020; Lai and Lam, 2021; Peeling and Olliaro, 2021). These findings are consistent with what Wadvalla (2020) reported. South Africa was the first country on the African continent to conduct large-scale community screening and testing to manage the spread of the virus. Various studies show the importance of large-scale testing and screening (Täufer, 2020; Brault *et al*., 2021; Mercer and Salit, 2021).

However, according to Wadvalla (2020), inadequate resources and infrastructure soon caused massive backlogs and around a two-week turnaround time for results. This had a dire knock-on effect on the country’s containment strategy, and in most instances, it became virtually impossible to trace and manage all patients. This is in line with Mendelson and Madhi’s (2020) assertion that South Africa's coronavirus testing strategy was broken and not fit for purpose and that due to the epidemic reaching its exponential phase in the country, the focus needed to be on the mitigation of severe illness and death rather than aspiring to containment. The authors showed that despite the initial lockdown allowing more time for preparation for the healthcare system, significant cracks had started to show, causing a deterioration in clinical service that threatened the country's response to the epidemic.

The capacity of 36000 tests per day promised by the National Health Laboratory Service had not materialised due to poor planning (NHLS, 2020). In addition, the country's dependency on foreign companies for testing materials and kits led to severe shortages. Various countries started holding back from exporting the highly demanded kits (Nkengasong, 2020). This saw the turnaround time in some parts, such as the Western Cape, increasing from less than a day to two weeks as the laboratory testing capacity became overwhelmed by the accumulating demand. In a situation where healthcare is free at the point of service, as it will be if and when the NHI is implemented, limited laboratory testing and undeveloped supply chains can be major sources of inefficiencies, as the pandemic showed. Thus, the NHI has to be accompanied by adequately developed and maintained laboratory services and supply chains.

(iv) Other pre-existing system problems

Other pandemic-related inadequacies relate to inadequate resources and infrastructure availability and distribution. If they persist and are not addressed fully, they may be a significant threat to the NHI. For one, most of the covid-19 hospitalised patients in South Africa were elderly. High baseline comorbidities were reported in 77.6 percent of these patients (Kaswa *et al.*, 2021). However, this was expected, given that communicable and noncommunicable diseases contribute a considerable component of the quadruple burden of disease in the South African healthcare system (Bradshaw *et al.*, 2019; Modjadji, 2021). Accordingly, this highlights the level of demand that may choke the NHI if it is not designed to cater to such a burden from the elderly and non-active part of the population.

For those living in overcrowded and poverty-stricken urban areas with limited access to basic infrastructure, mitigation and suppression strategies that could have helped slow down the pandemic's spread were hard to employ. These measures are resource and infrastructure-dependent (De Groot and Lemanski, 2021). This was particularly so in contexts where governments, such as South Africa, could not finance safety nets for the poor. Moreover, global public health recommendations failed to recognize these inequalities and adapt the advice to national and local contexts (De Groot and Lemanski, 2021). Public health security during the pandemic was limited by the continuing deterioration of the public health infrastructure, lack of private sector reforms, weak healthcare subsystems and poor organizational structures (Alegbeleye and Mohammed, 2020).

The lack of political will, human resources shortage, and diverted resources significantly impacted the provision of emerging pandemic-related care and highlighted enormous capacities that can be harnessed through competent policymaking and healthcare reform (Alegbeleye and Mohammed, 2020). This study, in line with other international studies (Benjamin, 2020; Sharma *et al*., 2021; Winkelmann *et al*., 2021), highlighted the link between policy reform, infrastructure adequacy and the system's preparedness. Alegbeleye and Mohammed's (2020) findings are also consistent with Blignaut *et al*. (2020). They noted that South Africa, a resource-poor country with unresolved infrastructure challenges, could not implement infection controls effectively. It follows that if the NHI is under-resourced, many problems will ensue.

Overall, the amalgam of the findings from these studies highlights how the South African healthcare system was on the brink of collapsing as the pandemic intensified. Due to limited resources, most of the risk came from failing to assess, diagnose and control the covid-19 variants. Testing soon became biased towards symptomatic cases even though a high proportion of covid-19 cases were asymptomatic, and infectiousness starts before symptom onset (Cohen *et al*., 2021). Without the required resources and infrastructure, the only response was rationing medical equipment and interventions. It is not surprising that in an era when political leadership mattered significantly, links have been drawn between resources and infrastructure availability and government administrative capacity (Christensen and Lægreid, 2020; Emanuel *et al*., 2020; Kavanagh *et al*., 2020; Chisadza *et al*., 2021).

3.3.2 Healthcare administration and the covid-19 pandemic

This section focuses on the healthcare system's administrative inadequacies, which are seen as threats to the NHI purported to have been exposed by the covid-19 pandemic due to the increased disease burden with which it came. As mentioned above, the pandemic has placed tremendous demand on healthcare administrative structures in the country. Examining this pressure and how the South African government handled it could shed more light on how the NHI will perform based on its administration once it is fully implemented. The blend of the evidence from the various studies indicates that some administrative steps the government took were reasonable and contributed immensely to protecting the healthcare system from imminent collapse. However, there were some decisions taken that were either wrong or inadequate.

i. Quick government action on the covid-19 pandemic

From the date it was announced that the coronavirus had reached South Africa, there was widespread panic in the country. This was born from the realisation that the healthcare system would eventually collapse due to the pressure of its additional burden on top of the quadruple burden that the South African healthcare system already faced. However, the South African government took swift action in early 2020 to protect the healthcare system from being run down by the pandemic (Naidu *et al*., 2020). Unsurprisingly, the South African government was dubbed a global pioneer in future policy development and crisis management strategies. This is especially true for other governments that need to reduce the burden on their healthcare systems for an impending influx of patients. Its seemingly robust principles in managing the pandemic, which employed strong policymaking and legislation while dually safeguarding the lives of citizens, were seen as facilitative for more precise and useful management of resources (Banerjee *et al*., 2020).

Further, South Africa, although beleaguered, underfunded, and having dismal human resource capacity, has experience with viral pandemics and tuberculosis (Wood *et al*., 2010; Churchyard *et al*., 2014). It also boasts a wealth of experienced epidemiologists (Zweigenthal *et al*., 2016; Reddy *et al*., 2019). The government quickly drew on this experience in its early decisive action. It was also quick to offer social, material, and psychological support, all of which increased trust in the efforts to mitigate the catastrophic effects of the pandemic (Naidu *et al*., 2020). The government also redirected funding to the public health system to support testing, tracking and tracing, and treatment for covid-19. This is consistent with Moonasar *et al*.'s (2021) finding that the government took highly positive administrative actions during the first surge in the reported covid-19 cases. There was an institution of a multisectoral approach, and a national command council was established to take government-wide decisions.

ii. Strategic government responses

Using an adapted WHO strategy, the South African government created national and provincial incident management teams comprising various work streams (Moonasar *et al*., 2021). WHO's (2020) strategy was based on what they knew about the virus. It translated knowledge into strategic action to guide the efforts of all national and international partners in developing context-specific national and regional operational plans. It did so by focusing on aspects such as scale and speed of spreading, the severity of the cases and socioeconomic disruption, which was able to provide practical guidance for whole-of-government and whole-of-society strategic action that could be adapted according to specific national and subnational situations and capacities (Ghanbari *et al*., 2020). Thus, the government strengthened command and control through centralised and decentralised incident management teams, enhanced the swiftness of evidenced-based decision-making from the highest political levels and allowed time for the healthcare sector to increase healthcare capacity (Moonasar *et al*., 2021).

The government's success in handling the pandemic was highlighted by how the country flattened the curve of infections (Stiegler and Bouchard, 2020). The number of daily new confirmed covid-19 cases per million people declined from a very sharp initial increase (Our World in Data, 2022). This was a welcome development as the upsurge in cases and deaths had been concerning. South Africa has a highly vulnerable population with a high prevalence of comorbidities, as shown by how it quickly became the most affected country on the continent (Sanyaolu *et al*., 2021). As South Africa quickly triggered lockdown measures, the country significantly reduced its background mortality rates (Divala *et al*., 2020). To continue containing the crisis, the government chose to deconfine slowly, respecting a five-phase plan (Stiegler and Bouchard, 2020). These successes seem to point out a well-thought-out strategy against the covid-19 pandemic by the government in South Africa that gave the healthcare system a chance of survival.

iii. Lack of justification for some actions

Despite the initial success of the pandemic management, the government's initial actions against covid-19 were not informed by local data, locally parameterized models, local epidemiological expertise, or qualitative local knowledge (Broadbent *et al*., 2020). It is possible that the healthcare system's vulnerability – a system already experiencing a quadruple burden of disease and various other challenges (Ataguba *et al*., 2020; Hofman and Madhi, 2020) – may have motivated these uninformed responses by the government. There are suggestions that many of the actions taken were based on a political need to display strong leadership internally and to look good internationally. Some of the reasons for locking down were not clearly articulated, the rationale for ongoing actions was poorly communicated, and the initial decisiveness gave way to a lengthy paralysis during which communication was confusing

(Broadbent *et al*., 2020). As time passed, the content of the regulations was increasingly questioned (Bhorat *et al*., 2020; Hatefi *et al*., 2020; Schröder *et al*., 2021).

The evidence base for such restrictions was contrasted unfavourably with evidence of the political influence of illegal trade interests (Broadbent *et al*., 2020). There has been massive debate regarding the difference that the lockdown made to the preparedness of the healthcare system as a whole. The hospitals were still overwhelmed when the pandemic peaked until the tide turned (Harding, 2020). Diversions of resources within and into the healthcare system also did not significantly increase the capacity to manage the pandemic. Testing, one of the most vital components of the healthcare response, highlights the inadequacy of government strategies; over half of the four million tests conducted have been private (Mkhize, 2020). The substantial stimulus package has also fallen short in its initial implementation, with food parcels being diverted by corrupt local government officials (Mahlangu, 2020) and system failures, making the collection of grants difficult months after their introduction (Mlamla, 2020). These failings have the apparent potential for health impact.

Unsurprisingly, some of these measures employed by the government soon became the source of accusations. Some groups noted the inconsideration of the severity of the everyday lived realities of the poor (Singh, 2020). Strong characterisations like crypto-fascist authoritarianism were used to describe some of the measures. Support thereof started collapsing (Everatt, 2020). The government's scientific counsel, credited for responding to the pandemic, came under heightened scrutiny. Accusations of hiding behind obfuscation, mixed messaging and presenting science as fact quickly eroded public trust in government and science (Singh,2020). Munzhedzi (2021) consistently reported that governance principles in terms of the rule of law, public participation, transparency, accountability, decentralisation, effectiveness and efficiency were not adequately adhered to by the government. There was an imbalance between adherence to principles of good governance to ensure accountability in using state resources and ensuring effective disaster management.

iv. Poor vaccination strategy

There is also the issue of vaccines. According to Dallmeier *et al*. (2021), in the absence of herd immunity, rigorous community measures and lockdowns must be imposed, often recurrently, with a dramatic impact on economies. Vaccines are the only valuable option for herd immunity without excess mortality. Yet, there is evidence that poor administration has also extended to securing and distributing vaccines. Reddy *et al*. (2021) examined the clinical outcomes and cost-effectiveness of covid-19 vaccination in South Africa. They found that an efficient vaccination program would reduce infections and deaths and likely reduce overall healthcare costs, even with conservative assumptions about vaccine effectiveness. Their models accentuated that rapid distribution of vaccines should be prioritized over the relatively small differences in vaccine effectiveness and price on which the government was ill-focused. The pace of vaccination is as or more important than population coverage. Thus, attention to vaccination program infrastructure is critical.

Sen-Crowe *et al*. (2021) also showed that South Africa was one of the first countries on the continent to receive vaccines. However, only 5.7 and 2.8 persons per 100 had been partially and fully vaccinated, respectively. Despite some anticipated vaccine orders being left unfilled due to increased demand in suppliers' systems, a more robust explanation is the inadequate administration of doses that have already been delivered to South Africa. Per WHO (2021), only about half of all vaccines received by South Africa had been administered as of 6 May 2021. Further, as noted by Baleta (2020), based on a World Economic Forum (WEF) survey, South Africa falls in the group with the least intention to get vaccinated. There was a marked observation in the survey; distrust of vaccines mirrors low confidence in public institutions. In South Africa, 32% of citizens said they had no confidence in hospitals and clinics. The perceived lack of vaccine safety surveillance and assessment systems worsened this.

Cooper *et al*. (2021) also noted how the government failed to strategically provide information on the vaccines as a platform for broader trust-building focused on transparency, participation, and justice. The study showed a robust relationship between attitudes toward vaccination and political discontent with the government's handling of the pandemic. In line with various other studies (Fisher *et al*., 2020; Lin *et al*., 2021; Smith *et al*., 2021), perceptions of the government's incapability in ensuring vaccine safety and effectiveness and political over-handedness in the vaccine development process accounted for 14% and 8% of reasons for not wanting to be vaccinated. This is consistent with the African CDC (2020) survey in multiple African counties, including South Africa, where most respondents committed to being vaccinated if vaccines were deemed safe and effective. Their need to confirm safety and effectiveness may be due to lived experiences where many vaccine-preventable infectious diseases are still causing thousands of deaths annually (Machingaidze and Wiysonge, 2021).

The evidence from the studies explored above highlights the pressure the administrative structures faced owing to the covid-19 pandemic. The government responded swiftly with various measures, including setting up multisectoral response and advisory teams at provincial and national levels, to allow the healthcare system, typified by various inadequacies and significant vulnerability, to prepare for the onsetting pandemic. This earned them international applause as other international healthcare systems became increasingly overwhelmed. However, the possibility that the measures taken were inconsiderate of specific local contexts may have taken away from the initial success. Some measures were too authoritarian, and the scientific council that backed some of the measures and decisions fell under scrutiny. The poor administration also extended to vaccine management. Thus, while the government administration of the pandemic was initially admired, various inadequacies started showing as the pandemic progressed.

3.3.3 Discussion of findings in relation to the NHI

As shown above, the pandemic brought unprecedented challenges by increasing the disease burden. However, there was significant variability in how healthcare systems managed the pandemic globally. Governments sought to regain control of respective healthcare systems over a highly uncertain and dynamic threat from the pandemic by formulating strategies that were implemented at considerable economic, societal and political costs (Boin *et al*., 2020). Typical modes of policymaking had to be abandoned as conventional toolkits and contingency plans proved ineffective (Boin *et al*., 2020). It is, thus, unsurprising that the variability in the performance of the healthcare systems can be linked to differences in administrative capacities across the same healthcare systems (Blanchard *et al*., 2020; Boin *et al*., 2020; Toshkov *et al*., 2021). Boin *et al*. (2020) noted that countries had different starting points in administrative capacities, so the differences in their performance should not be a surprise.

Similarly, marked differences in the availability and distribution of resources and infrastructure can explain the vast differences in how these systems performed when the pandemic intensified. This is because the resources and infrastructure available determine the care capacity, especially acute and critical care, which became vital during the pandemic (Giannakeas *et al*., 2020). In most cases, without aggressive measures such as physical distancing measures, healthcare systems worldwide would have been inadequately equipped to manage the expected number of patients with covid-19 despite a rapid increase in capacity through rapid investment (Barrett *et al*., 2020). In some settings, the prioritisation of patients most likely to survive over those with remote chances was considered due to the lack of resources (Mannelli, 2020). In other instances, it was suggested that benefits from resources could be maximised by focusing on life years saved – a younger person would be prioritised over an older patient with a similar prognosis (Brown *et al*., 2020).

The situation internationally has not been too different from the experience in South Africa. Based on the evidence presented in the previous section on two main issues – resources and infrastructure availability and distribution and healthcare administration and governance – it is apparent that the South African healthcare system was subjected to significant pressure from the pandemic. In this context, the question of whether the country could have performed better had the NHI been in place before the pandemic hit South Africa came up. This question could only be explored by first looking at the provisions in the NHI that relate to the administration and governance and the availability and distribution of resources and infrastructure in the healthcare system and using them as a point of departure in the discussion (NDoH, 2017). Those provisions paint a picture of what the healthcare system may look like once the NHI has been fully implemented in South Africa.

Regarding resources and infrastructure availability and distribution, particularly human resources, there is a possibility that having the scheme would have ensured enough healthcare personnel of diverse capacities to deal with the pandemic. This assertion is based on one of the provisions of the NHI regarding the lack of professionally trained healthcare workers. The scheme has been designed with clear strategies for recruitment, training and retention of healthcare workers to ensure a more equitable distribution of well-trained healthcare personnel across the country's provinces, districts and healthcare sectors – public and private (NDoH, 2017). A well-designed human resources system would have ensured equitable distribution of personnel during the pandemic and enhanced manoeuvrability of personnel from one area to another, depending on need. It could also have increased the number of healthcare personnel available. In turn, the increased numbers could have significantly improved distribution.

This is because when resources are scarce, geographical and sectoral maldistribution of the same resources worsens at the expense of less affluent districts and the public sector and in favour of the more affluent districts and the private sector. Higher numbers of workers could also have been helpful in the laboratory services as testing became one of the mainstays in the fight against the spreading of the coronavirus (Kavanagh *et al*., 2020; Mercer and Salit, 2021). The impending NHI could have addressed the issues relating to the performance of the laboratory service, particularly the long turnaround times that compromised the management of covid-19 and triage through the hospital (Mendelson *et al*., 2020; Wadvalla, 2020). The plan to reorganise laboratory services through several interventions – the implementation of a gate-keeping tool, provincial verification of billing, an alternative financing model for training and a review of the current fee-for-service model used for billing (NDoH, 2017) – could have enhanced their performance during the peak of the pandemic.

There are also plans to expand the platforms for international collaboration on human healthcare resources, local medical schools' intake, and the primary training nursing colleges inside hospitals that provide practical training at the hospital bedside. A similar provision exists for other healthcare professionals registered through the Health Professions Council of South Africa to ensure that population needs are met holistically (Smith *et al*., 2018). Beyond the quantity and quality of health professionals, there is an equal emphasis on ensuring that those recruited are satisfied and retained, especially in areas facing acute shortages, such as rural areas (Mafolo *et al*., 2019). Further, with the emphasis that the scheme places on community healthcare centres, the community healthcare workers' contribution to the healthcare system will be enhanced (Caldwell and Aldous, 2017). This is especially needed if primary healthcare – which ensures that people's basic health needs at the grassroots level are met and reduces the overall burden on the system – is to be enhanced (Mhlongo and Lutge, 2019).

This bodes well with the scheme's description as an opportunity to institutionalise human healthcare resources planning in South Africa. One of the most considerable contributions such a plan would make to the national healthcare system is enhancing the skills development of healthcare workers. During the current pandemic, this would have been valuable as, according to Rispel (2016), most healthcare workers possess neither the skills nor a professional code of practice. Perhaps the need to call upon unprepared and less skilled junior doctors to help manage the pandemic in the areas of triage decision-making and critical care management outside the intensive care unit as the virus spread exponentially would have been significantly reduced (Ahmed and Davids, 2021). Dealing with the pandemic requires considerable medical skills, sharp decision-making ability and a professional code of practice. The lack thereof saw many healthcare workers contracting the virus and making poor decisions regarding operations in healthcare facilities at all levels of care.

The NHI could also have helped alleviate the challenges related to the inadequacies of healthcare facilities and infrastructure had it been in place. From the studies reviewed in the previous section, it is clear that infrastructure has been a significant challenge for South African healthcare in terms of sufficiency and quality. Delays in creating designated covid-19 areas in the emergency departments and general wards (Thomas *et al*., 2020) and having to institute longer and more disruptive lockdowns as field hospitals were being prepared (Rispel *et al*., 2021; Bulajic *et al*., 2021) highlight the plight that the South African healthcare system was faced with due to lack of good infrastructure. The field hospitals were also typified by controversy – most were not used despite vast sums of money being spent in setting them up, some were defectively designed to the extent that they were unfit for purpose, and decision-making in their setting up and operations was not agile enough but rather too compartmentalised (Rispel *et al*., 2021).

The lack of infrastructure, and wards for critical care and intensive care units disrupted routine, essential services as priorities for healthcare were reordered, and hospitals were reprogrammed to accommodate covid-19 patients. These unanticipated healthcare system costs can easily be traced to the lack of infrastructure (Hofman and Madhi, 2020). There is a strong possibility that, due to poor priority-setting approaches, lives saved from covid-19 could be far fewer than lives lost due to disruptions of essential services. However, the NHI contains a proposal for the Office of Health Standards and Compliance to be set up to inspect and accredit facilities and set norms and standards for these facilities (Naidoo, 2012). Having such an authority in the healthcare system could have ensured that most – if not all – facilities were up to standard in handling coronavirus cases. It also means that the capacity to deal with the pandemic would have been higher and evenly distributed, leading to fewer transmissions and deaths.

The scheme is also geared to deal with the pharmaceutical supply chain through pharmacoeconomic evaluations to inform the rational selection and reimbursement policies (Suleman and Gray, 2017). This would have been important because, during the pandemic, the pharmacies in many communities became the most accessible healthcare providers and the first point of patient engagement with the healthcare system (Alabbasi *et al*., 2021). However, supply chain disruptions amid constrained resource availability marred that function (Hedima *et al*., 2021). Thus, the framework envisaged in the scheme could have gone a long way in ensuring that the pharmaceutical supply chain faced minimal disturbances during the pandemic, a time when it needed to operate at its highest efficiency level. Further, the scheme could have provided equitable access to medicines and related pharmaceutical products through public pharmaceutical infrastructure and accredited and contracted private retail pharmacies based on need. This is contained as a goal and a provision in the white paper (NDoH, 2017).

Of note, all the resources and infrastructure inadequacies are fundamentally linked to inadequate funding in the healthcare system, particularly in the public sector. To deal with this challenge and ensure funding sufficiency, the NHI will be financed through mandatory prepayment, which is distinct from other modes of payment, such as voluntary prepayment and out-of-pocket payments (NDoH, 2017). The aim is that through the creation of a single fund, fragmentation in funding and provision of health services in the public and private health sectors will be reduced, and efficiency and cost containment through streamlined strategic purchasing will be enhanced (Burger and Christian, 2020). All these gains will contribute to the sufficiency of the available funds. There is, therefore, a possibility that had the pandemic started when South Africa had a fully functional NHI, funding would have been available to some extent to meet the sudden increase in disease burden and demand for services accompanying covid-19.

The scheme also has specific administrative provisions that could have enhanced the government's response to the pandemic. For instance, the scheme will be implemented by creating a single fund that is publicly administered and established through legislation as an autonomous public entity (NDoH, 2017). This requires a precise specification of functions, responsibilities, governance structures and accountability mechanisms (Hendricks *et al*., 2014; Oboirien *et al*., 2018; Murphy and Moosa, 2021). The need for such clarity and mechanisms heightened at the pandemic's peak. In a rapidly changing environment that involved dealing with an unpredictable pandemic with unpredictable impact, decisions had to be made quickly and, in most instances, without enough information to justify specific actions. Mixed messaging in policy issues (Singh, 2020) and poor adherence to governance principles (Munzhedzi, 2021) could all have been avoided, thus ensuring accountability in using state resources and effective management of a healthcare crisis.

Further, the fund will assume full responsibility for the pooling and disbursement of funds to strategically purchase services from accredited providers (NDoH, 2017; Michel *et al*., 2020; Atim *et al*., 2021). This provision would have come in handy during the pandemic, where the demand for healthcare services was exceedingly high due to the increased disease burden from covid-19. The funds to finance those required services were low due to the country's poor economic performance. Administratively efficient systems and mechanisms will be implemented to ensure that all funds are appropriately channelled into the scheme as part of the broader pool for financing health services (NDoH, 2017). This will eliminate duplicative administrative and benefit disbursement systems. Having such a fund could have improved access to vaccines at a national level. However, South Africa failed to execute a cost-effective covid-19 vaccination initiative that would have reduced overall healthcare costs even with conservative assumptions around vaccine effectiveness (Reddy *et al*., 2021).

Another administrative provision relates to central hospitals; these would have been reformed to be semi-autonomous had the scheme been implemented. This provision necessitates the prioritization of the full decentralisation of central hospitals' management functions and responsibilities to ensure their effective functioning and sustainability. It also requires that their management has full delegation and decision-making powers in domains like finance, human resources, infrastructure and technology (NDoH, 2017). These changes were necessary due to the cross-provincial differences in the impact of the covid-19 pandemic that required the appreciation of the local context (Arashi *et al*., 2020; Jassat *et al*., 2021; Sykes *et al*., 2021). Expectedly, one of the criticisms levelled against the government's response to the pandemic is the inconsideration of local context - local data, locally parameterized models, local epidemiological expertise and local qualitative knowledge (Broadbent *et al*., 2020). The government is seen as having panicked because of the vulnerability of the healthcare system.

District health management offices will be established to manage district health services. These will be structures to which management, planning and coordination of personal and non-personal health service provision responsibilities are delegated, considering national health policy priorities and guidelines and health needs in the district. The structure will consider the need to separate the function of purchasing personal healthcare services from the function of health services (NDoH, 2017). Such a provision would ensure that decentralisation goes beyond the provincial and district levels. A well-structured district structure can catalyse necessary change by improving commitment, coordination and cooperation. In particular, such structures can promote the formation of non-hierarchical collaborative networks and improve the coordination between community, primary healthcare and hospital services at a district level (Schneider *et al*., 2020). These aspects would have enhanced the response to the covid-19 pandemic at the fundamental district level.

However, there is no guarantee about how the NHI would have ensured better management of the pandemic in South Africa. For one, the strong anti-transmission measures employed to give the healthcare system enough time to prepare based on the fear it would be overrun if cases spiked (Makoni, 2020) may not have been implemented. Having an NHI and resultantly perceiving a robust healthcare system could have given the government a false sense of security. Instead of the initial hard lockdown (Banerjee *et al*., 2020), the subsequent lockdowns (Are and Colijn, 2021) and the five-phase deconfinement plan (Stiegler and Bouchard, 2020), the government could have locked down late or come out of lockdown too early. This would have been very catastrophic. Countries with more robust healthcare systems, such as Italy, Sweden and Spain, failed to appreciate the severity of the threat that covid-19 posed, locked down late and faced significant crises compared to South Africa (Nacoti *et al*., 2020; Yan *et al*., 2020; García-Basteiro *et al*., 2020).

Further, a successful and sustainable scheme is not guaranteed, even though it is portrayed as the solution to every healthcare problem. For one, there are significant systemic inadequacies and challenges - a rising quadruple burden of disease (Basu, 2018), gross inequalities and inequities (Bresick *et al*., 2019) and lack of requisite government administrative capacity (Moola, 2019) – all of which have no guaranteed solution. The NHI has been proposed and will be implemented to deal with some of these inadequacies. However, as these challenges are firms engraved in the healthcare system, there is a risk of introducing the scheme on a derelict foundation. The NHI is threatened by the systemic inadequacies it has been built to address. Therefore, inefficiencies could have been introduced in the healthcare system had the government implemented the scheme on a derelict foundation before the pandemic. In turn, the coronavirus pandemic response could have worsened in a progressively inefficient system.

The success of the NHI may have been compromised by its hast implementation. At the moment, the plan is to have the system ready by 2026. This requires three phases to have been completed. Phase 1 involves piloting health system strengthening initiatives and the establishment of the fund and key institutions; Phase 2 involves ensuring that the fund is fully functional and has the required management and governance structures, and Phase 3 includes the introduction of mandatory prepayment and the contracting of accredited private hospital and specialist services. For all these aspects to be completed by 2026, especially given the current status and the healthcare system setup, would mean that processes must be rushed. This is in contrast to the protracted periods that it took for other countries, such as Germany, and South Korea, to fully implement their schemes, allowing them to adjust slowly and more sustainably to the needs of the populations they are serving (Bärnighausen and Sauerborn, 2002; Kwon, 2009; Van Ginneken, 2010).

There are also concerns about the affordability of the much-anticipated scheme. Omarjee (2018) pointed to the lack of a realistic costing framework in line with the fiscal resource envelope. Unaffordable and unsustainable benefits packages and unchecked demand for services due to ineffective cost control mechanisms will likely typify the scheme, especially given that care will be free at the point of service. Also, the limited, regressive, and insufficiently broad tax sources may not be enough to adequately finance the scheme (Ataguba and McIntyre, 2018). The coronavirus pandemic – with the accompanying disease burden – would have added to the expenditure level in the scheme that would have threatened its sustainability. Further, poor economic performance during this period due to the vast restrictions and global supply chain disruptions would have reduced the already low funding for the scheme, and the scheme's collapse would have been likely, which would have had a catastrophic effect on the healthcare system.

This could have been worsened by dismantling the two-tier financing system seen as a threat to the NHI. Introducing the scheme as a single-payer would help control the pricing of services by providers. Therefore, had the NHI been implemented, the public and private funding systems would have already been folded into a single entity (Mathew and Mash, 2019). However, despite some of its shortcomings, the private sector is much more efficient. It has led to many efforts to manage the coronavirus pandemic, such as testing and vaccinations. Without this privately-funded sector, the public sector alone may have collapsed as cases increased. Further, the additional funds paid by private healthcare users into the healthcare system would have disappeared while the public system would have been left with more people to treat (Serfontein, 2017; 2018). So, while the NHI would have led to some improvements in the healthcare system, the possibility of a chaotic disruption to the system should be appreciated.

Another long-standing argument against the NHI is that it is currently conceived as a one-dimensional solution to a multifaceted problem (Nkalai, 2020). The scheme focuses on the financial aspects of healthcare, assuming that removing the financial burden of healthcare will solve all other health issues in the country. While much of the healthcare problems in the country can be traced to how services are financed, focusing only on the financing part of the problems would not be an integrated approach to reform. There is an assertion that the government is going ahead with an infeasible scheme only to demonstrate that there is a political will to reform healthcare in South Africa, the lack thereof being a point that has been raised whenever the state of the healthcare system was mentioned (Pinkney-Atkinson and Alliance, 2019; Michel *et al*., 2020). This is almost similar to how many actions taken during the covid-19 pandemic are seen as being influenced by a political need to display strong leadership internally and to look good internationally (Broadbent *et al*., 2020).

3.4. Chapter summary and conclusion on the case of covid-19 in South Africa

In this chapter, the focus was on the case of the covid-19 pandemic. It built on the findings of the previous chapter in which two main systemic threats to the successful implementation of the NHI – the insufficient administrative capacity of the government and resources and infrastructure unavailability and inequitable distribution – were identified. The aim was to further examine these systemic inadequacies in the context of covid-19. Due to the increased burden on a system already suffering from a quadruple disease, the pandemic may have further highlighted the magnitude of inadequacies. By examining how the South African healthcare system fared with additional burden – a likely scenario under the NHI once healthcare services are free at the point of service – a picture of the threats that the scheme is likely to contend with could be painted, and the provisions to deal with those threats could be evaluated.

3.4.1 Review of objectives

In this chapter, the overall aim was to examine the same systemic threats to the scheme identified in Chapter 2 but using the covid-19 pandemic as a case study. The reliance on the pandemic in such an examination was based on the realisation that covid-19 increased pressure on resources and infrastructure as well as administrative structures in the healthcare system in a manner that could mirror what might happen when the scheme is fully implemented nationally. Implementing the NHI is likely to alter the health-seeking behaviour of beneficiaries, as care will be free of charge at the point of service. Accordingly, this chapter explored the extent to which the covid-19 pandemic exposed the threats to the NHI in the South African healthcare system. It also examined whether having an NHI before the pandemic would have led to a better response to the covid-19 pandemic.

A systematic review of the literature containing evidence of how the South African healthcare system managed the pandemic in light of systemic inadequacies was employed to achieve these objectives. This approach was based on how evidence-gathering in healthcare and healthcare policy is particularly important, and systematic reviews contribute immensely to those efforts

(Govere and Govere, 2016; Fatima *et al*., 2019; McCartney *et al*., 2019). Searches were run separately for administration, resources and infrastructure to ensure a higher level of comprehensiveness and representativeness of studies identified and snowballing was employed to access additional relevant studies. The inclusion and exclusion criteria were applied to the studies yielded by the searches, following which the remaining studies were assessed for quality using the CASP tool. A data extraction form was used to extract data from the selected documents, and the NVivo qualitative data analysis software program was employed for inductive content analysis.

3.4.2 Review of findings

Based on the first research question – the one on the extent to which the covid-19 pandemic highlighted the poor administrative capacity of the government as a threat to the NHI – the evidence painted a gloomy picture of the scheme. Initially, the government seemed to have managed to put robust measures in place to control the transmission of the virus while stalling the preparation of the healthcare system if cases spiked. Strict measures – for which the stringency index was remarkably high relative to various other countries – were implemented to protect the healthcare system that was considered to be very vulnerable. The swift action taken by the South African government earned the country international plaudits, and it was quickly dubbed a global pioneer in future policy development and crisis management strategies. Further, the decision to draw on the experience with viral pandemics and tuberculosis increased trust in the efforts to mitigate the catastrophic effects of the pandemic.

National and provincial incident management teams comprised of various workstreams allowed the government to strengthen command and control, enhance the swiftness of evidenced-based decision-making from the highest political levels and allow time for the healthcare sector to increase capacity. The government's success in handling the pandemic was highlighted by how the country flattened the curve of infections during the first wave of infections. The government needed to get it right because South Africa has a highly vulnerable population with a high prevalence of comorbidities. The country significantly reduced its background mortality rates using various lockdown measures. To continue containing the crisis, the government chose to deconfine slowly, respecting a five-phase plan. These successes seem to point out a well-thought-out strategy against the covid-19 pandemic by the government in South Africa that gave the healthcare system a chance of survival.

However, the government has been criticised for implementing uninformed measures and acting on fear due to the vulnerability of the healthcare system. Further, the insufficient administrative capacity of the government became visible when the reasons for locking down were unclearly stated, and the indecisiveness that followed protests against continued lockdown. Hospitals that had formed the basis for lockdown restrictions were still overwhelmed, and any diversions of resources did not yield the desired effect on capacity. The government also failed to improve testing speed, especially in the public sector, even though testing was supposed to be one of the practical tools in response to the pandemic. The scientific counsel, the advice on which the government based most of their decisions, has been accused of mixed messaging and presenting science as fact. Finally, the failure to ensure a robust, cost-effective and rapid vaccination program due to poor communication and poor planning has been added to the criticisms of how the government has handled the pandemic.

From the second research question on the extent to which the covid-19 pandemic highlighted the unavailability and poor distribution of resources and infrastructure as a threat to the NHI, evidence shows that there was a considerable strain owing to the additional burden that accompanied the pandemic. The government scrambled to secure funds to meet the expected increase in the demand for healthcare while maintaining social welfare programs. The latter was just as needful as the former, as economic activity restrictions threatened the livelihoods of millions of South Africans. However, despite the measures taken by the government, there is evidence that the pressure on resources and infrastructure due to the pandemic was immense and went beyond what the healthcare system could handle and the additional funds and resources that the government could secure. This cannot be seen as a surprise as the healthcare system was already struggling under the quadruple disease burden.

The high prevalence of comorbidities such as diabetes, hypertension and human immunodeficiency virus also contributed to the pressure on resources. Thus, demand will skyrocket once healthcare is free at the point of service. International evidence regarding the requirements in the care of hospitalised patients from covid-19 highlights the demand for infrastructure and resources, especially for patients with at least one comorbidity. This was evidenced in South Africa, especially when the cost of care in the country is compared to other African countries. Intensive care units, mechanical ventilators, laboratory technicians and dedicated staff for critical care were in short supply. This maimed South Africa’s response to the pandemic. The hospitals the government was trying to protect from being overwhelmed by severe cases still experienced a surge in admissions. It did not help that there were long turnaround times for tests necessary for triage through the hospital.

Further, junior doctors without all skills for critical care and infectious viruses saw their responsibilities increase significantly due to the scarcity of personnel. Cross-geographic differences in capacities resulted in worsening inequities and inequalities in the healthcare system. Instead of an innovative, multi-sectoral and comprehensive provincial response to the pandemic aimed at addressing the dual challenge of saving the lives of people in the country and the economy at large, a compromised and cost-ineffective response to the pandemic was mounted. The pressure on resources and infrastructure increased significantly during the four waves. The discovery of new variants meant that it was only a matter of time before the system was choked by the assessment and diagnosis of the variants due to limited resources and the failure of case finding to blunt transmission rates. Without the required resources and infrastructure, the rationing of medical equipment and resources was the only alternative.

The third question explored in this study relates to whether having an NHI would have led to a better response to the covid-19 pandemic relative to the current response. It is possible that such a scheme in place – a single fund that is publicly administered and established through legislation as an autonomous public entity – would have given the government more control of the healthcare system. This is mainly in the pooling and disbursement of funds to purchase services. There would also have been more straightforward specifications of functions, responsibilities, governance structures and accountability mechanisms in the system. Mixed messaging on policy issues and poor adherence to governance principles could all have been avoided during the crisis. The reformed administration of central hospitals towards full decentralisation of their management functions and responsibilities and the establishment of district health management offices to manage district health services would have ensured adequate consideration of the local context in response to the pandemic.

The scheme could also have ensured an adequate personnel supply based on its recruitment, training and retention strategies. Adequacy of laboratory services personnel could have improved the response to the pandemic as testing became a mainstay in managing the virus. Further, community healthcare workers could have contributed more to the healthcare system during the pandemic's peak by emphasising community healthcare centres. The scheme, as a platform for the prepayment of healthcare services, could have reduced the impact of the pandemic on resources and infrastructure by ensuring enough funds were available to meet additional demand for services. Long, disruptive economic activity restrictions, the setting up of controversial field hospitals and the redirecting of resources from other diseases to covid-19 could all have been avoided if the healthcare system had been well-funded.

However, there is no guarantee. For one, the scheme could have provided a false sense of security, leading to weak anti-transmission measures. Further, a successful scheme is not guaranteed as there are systemic challenges. The scheme could have been introduced on a derelict foundation, which would have affected its ability to translate additional funds into improved care and deal with the disease burden from the pandemic. There is also the affordability issue; the scheme has been described as lacking a realistic costing framework in line with the fiscal resource envelope. Thus, a rapid increase in demand due to covid-19 would have threatened its continued existence. The accompanying dismantling of the two-tier system in healthcare funding could also have worsened the unaffordability and unsustainability of the scheme, especially at the peak of the pandemic when demand for services was at its highest.

3.4.3 Chapter summary

While the covid-19 pandemic exerted pressure on all healthcare systems globally, differences in the robustness of these systems meant that some fared better than others. This chapter employed the pandemic as a case study on the evaluation of the NHI. It was asserted herein that the significant burden on administration, resources and infrastructure foreshadows the demand for services that will follow the introduction of the NHI. Basing the analysis on the threats identified in the previous chapter – administration, resources and infrastructure – evidence showed that inadequacies in these aspects led to a weak response to the pandemic. If not addressed, they may threaten the successful implementation of the scheme. Further, having a scheme like the one envisaged in South Africa could have helped in the covid-19 response, but that cannot be guaranteed because a successful scheme is not guaranteed either.

CHAPTER 4: THE AFFORDABILITY ANALYSIS OF THE SOUTH AFRICAN NHI

4.1 Introduction to the affordability determination of the South African NHI

The previous two analytical chapters – Chapter 2 and Chapter 3 - focused on the NHI's systemic threats. Notably, poor government administrative capacity, inadequate resources and infrastructure and the two-tier healthcare financing system were identified as the most credible threats to the impending scheme. However, even if the provisions of the NHI can deal with these threats, the scheme may still fail if it is unaffordable. Accordingly, the purpose of this chapter was to examine the financial affordability of the scheme. This was achieved by comparing projected revenues and costs, relying on several assumptions. The assertion was that even with a solid foundation as far as the system is concerned, unaffordability would still render the scheme unsustainable and, at worst, catastrophic as it may leave the healthcare system in a worse state than the current one.

This chapter is organized as follows: Section 4.1 provides the background to the chapter, focusing on the issue of affordability. Section 4.2 presents a conceptual description of healthcare financing components, the empirical literature on raising funds to fund NHIs and the empirical literature on purchasing services in NHIs. This section also provides a description of the South African context in light of the international literature. Section 4.3 presents a description of methods and approaches employed to examine the projected revenues, the projected costs and the scheme's affordability. Section 4.4 presents a brief overall discussion and synthesis of the results from the approaches employed, while Section 4.5 concludes the chapter.

4.1.1 Background to the issue of affordability of the scheme

The healthcare system's state, which seems to have been worsening over the past two decades, is of great concern to many stakeholders. Due to funding deficiencies, most healthcare facilities in the public sector remain inferior and lack the necessary equipment needed to provide adequate and quality care (Rusch *et al*., 2012; Surrender *et al*., 2016). Further, the number of available healthcare personnel is only a third of the required for the system to function correctly (Passchier, 2017). The absence of adequate pharmaceutical services at primary healthcare clinics and the frequent medicine stockouts represent a significant obstacle to disease control in South Africa (Kalonji and Mahomed, 2019; Koomen *et al.*, 2019). The current two-tier setup has worsened the funding deficiencies by exacerbating the inequitable distribution of resources in the system (James *et al*., 2018).

As fewer people can afford private care, pressure on public sector resources has become commonplace (Michel *et al.,* 2020). The consensus is that funding deficiencies will always be rampant as long as the two-tier system exists (Ataguba and McIntyre, 2018). The regressive and fragmented out-of-pocket payments have also been linked to funding deficiencies in the healthcare system as when people pay out of pocket, no pooling occurs. (Ataguba, 2021). Even in private medical schemes, pooling occurs at the option level, resulting in smaller, more fragmented risk pools (Kaplan and Ranchod, 2014). This means that the South African healthcare system has been missing the benefits of pooling, such as the reduction of uncertainty of demand and the flow of funds, increased likelihood of patients affording services and new provider investments due to a higher volume of services (Bazyar et al., 2016).

Instead, underfunding and severe financial shortages in the public sector have been common. Thus, the NHI's core is about transforming how healthcare is financed from the current two-tier to a single-payer system, which is a requisite ingredient for the sufficiency of funds (Murphy and Moosa, 2021). This would eliminate the inequitable distribution of resources fostered by the two-tier system and improve the pooling of funds relative to out-of-pocket payments and private medical insurance schemes (James et al., 2018). Nevertheless, funding issues may remain. Any change in the financing policy will not be enough if it does not include strategies to secure more funding for healthcare. The challenges are not only about maldistribution and suboptimal pooling but chiefly about the gross lack of financial resources in the system to cater for the needs of South Africans (Malakoane et al., 2020).

If financial resources are kept at the current level, they would not be enough to finance the expenditure required in South Africa because many people have no access to healthcare services because of financial barriers (McIsaac, 2019). Therefore, significant financial resources would need to be spent to reverse the trend of a worsening healthcare system. Healthcare services utilisation, propelled by the provision of healthcare services free of charge at the point of service, can drastically change when such schemes are implemented, resulting in prohibitive costs (Van Der Wielen *et al*., 2018; Zhang *et al*., 2018; Erlangga *et al*., 2019). However, since the single-payer fund will pay all providers, the costs will be lower because the fund will control and avoid healthcare cost escalation that usually typifies multi-payer systems.

Nevertheless, cost escalation goes beyond the advantages of a single-payer system. For one, the healthcare sector has a history of poor cost control. Thus, even in a single-payer system, the government's capacity in this regard is questionable (Passchier, 2017). The generous benefits package promised will also be a significant driver of costs, driven by the removal of long-standing financial barriers (Smith and Chalkidou, 2017). There is also the issue of coverage extension, a significant cost factor, especially in the initial stages of implementation (Long *et al*., 2016; Martin *et al*., 2016; Lan, 2017). While the scheme's implementation will be done in progressive stages, the timeline set to extend the benefits packages to the entire population in South Africa might be too short (Fusheini and Eyles, 2016). By the time proper cost controls are in place, a massive percentage of the population would already be covered.

The initial outlay in preparing the healthcare system for introducing the scheme can be a source of a short-term but significant rise in operational costs, especially considering the current state of the South African healthcare system (Okorafor, 2012). It may also have a bearing on the scheme if it is funded through loans that bear interest costs. Inflation could also be another issue in the provision of healthcare for everyone. Per Cuckler *et al*. (2018) and Yip *et al*. (2019), inflation is a principal factor in healthcare financing. Many aspects underlying expected changes in health-seeking behaviour may be sources of demand-pull and cost-push inflation in the healthcare sector. Finally, unchecked corruption can cause cost escalation, as has been the case in the healthcare sector (Amado et al., 2012; Rispel, 2016). These issues may coalesce to the detriment of the scheme in terms of its affordability and sustainability.

In the same vein as the costs, there are also concerns that the enormous funds needed to afford and sustain the scheme are beyond what the government can raise. The proposed sources include general taxes, complemented by mandatory payroll and surcharge taxes (McIntyre, 2012). Currently, health services are financed through allocations from general tax revenue, direct out-of-pocket payments, and contributions to medical schemes (Ataguba and McIntyre, 2018). In 2020, public sources contributed approximately 53 percent of total healthcare financing, and the private sector contributed 45 percent. The remainder was from foreign external sources, either through the government or through non-governmental organizations. This is a considerable change from the 2000 public, private and external contributions of 37 percent, 62 percent and 1 percent, respectively (World Bank, 2021).

However, with healthcare financing collapsed into one fund, all healthcare will be publicly financed, even if it is delivered publicly and privately. This will require a meticulous transformation of the tax policy in the country (Ataguba and McIntyre, 2018). Some tax rates will be increased, and new tax instruments may be introduced to meet the scheme's funding requirements. However, the sufficiency of such changes would depend on the country's economic performance, especially given that the NHI's introduction comes when the South African economy is not performing very well (Michel et al., 2020). If the country's economic performance worsens even slightly, as has been the case due to the covid-19 pandemic, the impact on the ability to raise funds would be catastrophic. This points out the possible limitedness of available funds to finance the scheme (Rolland *et al*., 2021).

The government has considered various tax instruments and combinations as financing massive healthcare reforms using one tax instrument may be impractical (Tu and Turner, 2019). However, considering the instruments' broadness, progressivity, efficiency and knock-on effects highlight the potential limitedness of funds (Reeves *et al*., 2015). Broad-based instruments which allow for the taxation of most of the potential tax base, progressive tax instruments wherein the tax rate increases with the taxable amount, tax instruments with fewer knock-on effects on the economy and those that allow for more efficient collection of funds are generally favoured. Of note, only general taxes in South Africa are progressive; most indirect taxes and private insurance are either regressive or insufficiently broad to finance extensive reforms proposed in the scheme (Ataguba and McIntyre, 2018).

Overall, the status of the current healthcare system highlights the need for financing reform. However, any such reform should be based on ensuring a balance between funds raised and healthcare expenditure. For the proposed scheme, there are concerns that the revenue-cost balance cannot be reached, meaning that it would be unaffordable. Thus, an ex-ante pre-implementation evaluation of the scheme's projected costs and revenues based on plausible assumptions was warranted to explore this assertion. The analysis herein relies on the evidence from literature about the key parameters driving costs and critical sources of revenues. The potential for wastage of resources, reduction in the healthcare system's capacity, and worsening of the current problems in the case of a scheme failure further fortified the need for this examination.

4.1.2 Statement of the problem on South African healthcare financing

Despite the consensus on its need in South Africa, there are concerns regarding the affordability of the NHI. One group argues that the scheme's cost of coverage is prohibitively high, and

South Africa cannot afford it; they argue that it will go beyond the government approximate of R256 billion per year once fully implemented (Passchier, 2017; Omarjee, 2018; Blecher *et al*., 2020). Another group argues that the government cannot raise enough revenue to fund the assemblage of reforms that the scheme represents, especially given that individual income tax accounts for 40% of the total revenue (Nevondwe and Odeku, 2014; Ataguba and McIntyre, 2018; Blecher *et al*., 2019). Despite these concerns, the South African government looks set and determined to implement the NHI, encouraged by the expectation that the scheme's affordability and sustainability may improve once it is fully implemented. Its success would be valuable for the healthcare system, but its failure would be catastrophic. There is, therefore, a need to examine the evidence on the scheme's projected costs and revenues to settle this debate.

4.1.3 Chapter's aim and objectives on the examination of the NHI affordability

The third objective of this study, as indicated in section 1.3 of Chapter 1, was to determine the extent to which the South African NHI implementation is affordable and sustainable. This objective formed this chapter's aim, which was achieved by exploring the following specific objectives:

- project the coverage costs of the South African NHI under certain assumptions;
- project the revenues of the South African NHI under certain assumptions; and,
- determine the extent to which the South African NHI is affordable based on the revenues and costs.

Various assumptions relating to the calculation of base costs of coverage, the total revenues that may be raised to fund the scheme and their respective growth rates as the scheme continues in full operation were made to achieve these objectives. Two approaches were employed: a non-parametric comparative analysis for the first year of full implementation and a Monte Carlo simulation for a more protracted period.

4.2 Empirical literature on healthcare financing

Healthcare financing is an extraordinarily complex issue, as seen by the sheer number of studies and debates concerning many highly dynamic aspects such as costs, revenues and financing structures. This section describes the concept of healthcare financing, the theoretical framework employed in this chapter and a review of empirical studies to give context to the pre-implementation evaluation of the NHI herein.

4.2.1 Conceptualisation of healthcare financing

At the core of any healthcare system, a properly structured healthcare financing approach – one that is based on sound policies that consider population dynamics and economic subtilities – can be a determinant factor in attaining a robust healthcare system (Moghadam et al., 2018; Rokicki et al., 2020). On the other hand, poorly-designed healthcare financing systems can fuel gross inequities for millions of citizens in the healthcare system (Pandey et al., 2018; Rostampour and Nosratnejad, 2020). In systems wherein the inequities are apparent, efforts are usually made to bring about corrective reform of the financing structure. This is usually in the form of NHIs or SHIs (Neethling et al., 2019). In such schemes, the aim is to design a financing mechanism or structure that optimises three functions under healthcare financing – sourcing funds, pooling funds and purchasing services.

The optimisation of the sourcing function is about ensuring the lowest socioeconomic impact in raising funds to finance healthcare (Moreno-Serra and Smith, 2015). The major sources of revenue usually include tax-funded government budget allocations, private insurance schemes and direct out-of-pocket payments (Piatti-Fünfkirchen et al., 2018; Dutta et al., 2022). However, optimising the revenue sourcing aspect involves a concerted effort to move towards a predominant reliance on prepaid public funding for health systems and the reduction of out-of-pocket payments (Chu et al., 2019). This is because prepaid sources such as general taxes and social insurance contributions favour the production of better population health outcomes for a given health budget than private prepaid insurance schemes and direct out-of-pocket payments (Moreno-Serra and Smith, 2015; Chu et al., 2019; Moreno-Serra et al., 2019).

The pooling function is about accumulating prepaid funds on behalf of the population to spread the financial risk of paying for healthcare (Mathauer et al., 2019). This is determined by the available prepaid resources and the pooling mechanism architecture adopted. The overall goal of optimising pooling is to eliminate fragmentation, a significant cause of health system inefficiency, as it limits the extent to which available funds raised through various means can be redistributed. It also restricts the extent to which financial risk related to healthcare can be spread, thereby curtailing the attainment of progress toward UHC (Kutzin et al., 2016; Ahangar et al., 2018). Thus, most countries have created larger rather than smaller pools, ensuring a more diverse risk mix within pools and using compulsory rather than voluntary pools to optimise this aspect in their health financing policies.

The purchasing function entails allocating pooled resources to health service providers to deliver health services on behalf of the population (Ekirapa-Kiracho et al., 2022). Optimising this aspect involves ensuring that purchasing health services is strategic and conducive to progress towards UHC. This is achieved when the allocation of pooled funds is linked to the information on the providers' performance and the population's needs (Klasa et al., 2018; Ekirapa-Kiracho et al., 2022). Policymakers can use this information to define which services respond to the population's needs, which providers can effectively deliver those services, how providers are paid and how compliance is monitored. The information-dependent process improves efficiency gains, increases the equitable distribution of resources and allows for efficient management of expenditure growth (Cashin and Gatome-Munyua, 2022).

Overall, any healthcare financing activity falls under these three aspects. Therefore, a comprehensive approach to raising revenues, pooling funds and purchasing services is crucial. However, this balance is not always easy to achieve because healthcare financing policy has to operate in a system that Anderson *et al*. (2005) characterised as complex and adaptive. The critical relationships are nonlinear and have significantly unpredictable dynamics. This was highlighted by Kutzin (2008), who showed that health financing policy is nested in the overall health system, and the performance in this regard is determined by stewardship, governance and oversight from the policymakers based on the intermediate and long-term universal health coverage goals. As illustrated in Figure 4.1 below, this system is a multidimensional optimisation problem when developing healthcare financing policy.

This description of the healthcare system was adopted as the theoretical framework for examining the South African NHI's affordability. It is clear from Figure 4.1 how complex, adaptive and relationship-dependent the healthcare environment that accommodates the financing systems is. The financing system does not act alone in achieving intermediate objectives and final goals. Instead, coordinated policies and implementation across the health system functions are essential. Thus, all healthcare system functions' performance, including the financing thereof, should be evaluated based on the intermediate objectives set in the system. These include ensuring quality, efficiency, transparency, accountability and equity in resource utilisation and distribution. In turn, these objectives should be subject to overall health systems goals such as positive health outcomes, equity, risk protection and a responsive system.

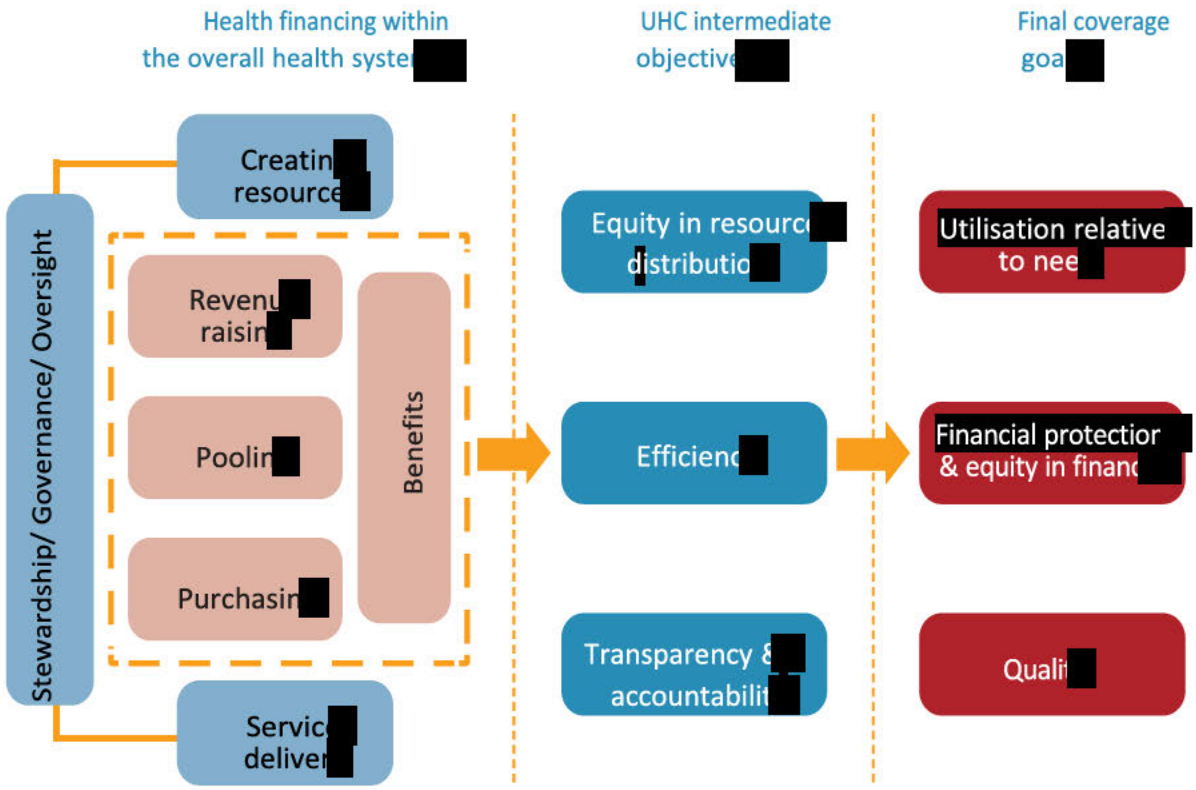


Figure 4. 1 Health financing system and policy objectives, functions, and goals.

Source: Kutzin (2008).

So, a similar pattern was followed in the pre-evaluation of the South African NHI's affordability. Regarding resource generation, consideration was made regarding the availability and broadness of tax instruments and other healthcare finance sources. Further, the possibility of combining various tax instruments to ensure that funds would be enough was also examined. The link between economic performance and tax revenues and how the health financing reform fits into the broader public finance system was also considered. In terms of service delivery, issues such as provider payer systems and payment methods, the size and comprehensiveness of benefits packages, rates of coverage extension until full implementation, the probability of uptake of benefits offered and the rates of utilisation of those services and cost and inflation control mechanisms were considered.

These considerations were made under the confines of the NHI's intermediate objectives, as detailed in the white paper (2017). The objectives include the need to pool funds and risks, ensure financial risk protection across the entire population, have a single, strategic healthcare services purchaser and ensure that healthcare is progressively financed. Meeting the intermediate objectives would contribute to the overall health system goals, such as the need to address healthcare structural problems that have contributed to poor health outcomes and effectively reduce the disease burden in the country. This improvement can only be achieved in a transformative and redistributive system focused on the progressive realisation of the right to health. It also requires the extension of coverage of health benefits to the entire population in an environment of resource constraint whilst benefiting from efficiency gains.

4.2.2 Empirical literature on healthcare financing

From the conceptual examination above, it is apparent that three functions under healthcare financing are essential. However, numerous empirical studies on healthcare financing fall under only two aspects – raising funds and purchasing services – and less on the pooling of funds. Literature on the pooling arrangements and their potential to contribute to progress towards UHC is mainly in the form of conceptual studies that provide insight into the structure of and mechanisms for pooling arrangements (Kutzin, 2001; Smith and Witter, 2004; Gottret and Schieber, 2006; Kutzin *et al*., 2010; Mathauer *et al*., 2019). Yet, the function of pooling and the diverse ways that countries organize this is critical for countries' progress toward UHC (Mathauer *et al*., 2019). This section contains the literature on raising funds and purchasing services in NHIs worldwide.

i. Literature on raising funds to finance NHIs

Regarding funding sources, most studies focused on the sufficiency of funds, financial protection, and progressivity and sustainability of the financing. For instance, Van Doorslaer *et al*. (1999) found that public finance sources in twelve OECD countries have more negligible positive redistributive effects and lesser differential treatment than private finance sources, which places a constraint on how much can be raised from each source. Wagstaff *et al*. (1999) found low levels of progressivity for the direct taxes in Sweden, reflecting the emphasis on a proportional local income tax for financing healthcare. Wagstaff *et al*. (1999) also found a regressive social insurance structure and a progressive private insurance structure in Germany but regressive out-of-pocket payment structures in Finland and Sweden. Their findings highlight the limitedness of funding sources based on how the healthcare system is structured.

Lim (2004) reported that the Singaporean financing reforms, which emphasised individual over state responsibility, were implemented at the expense of equity. However, Singaporeans were content with paying for a higher level of services. This highlights that providing good quality services might improve the willingness to pay, although they may cost more. People are usually willing to pay if there is they see the value. Access to needed healthcare for the poor is explicitly guaranteed, and mechanisms to protect against financial impoverishment from catastrophic illness exist. This experience highlights how it is pertinent that those who can pay for their healthcare be allowed to pay to improve the sufficiency of funding through a two-tier system setup. However, the government should protect the poor to improve equity by installing robust mechanisms in policy reforms.

O'Donnell *et al*. (2008) found that most middle-income Asian countries with universal systems had progressive tax finance even with narrow tax bases, progressive social insurance due to its partial coverage, and progressive direct payments. However, in high-income countries, direct payments were slightly regressive, and in low-income countries, the poor paid less and got less healthcare. This shows how country-specific the sufficiency of some funding sources for healthcare is. Wagstaff (2010) found that SHI does not necessarily deliver superior quality care at a low cost due to insufficient funding and providers' poor regulation. The study also found that such schemes have prohibitive costs of collecting revenues. While they can easily cover the formal sector and the poor, they fare poorly in covering non-poor informal sector workers until the economy has reached a high economic development level.

Limwattananon *et al*. (2011) found that the Thai system is equitably financed. It reached universal coverage quickly due to the increased progressive direct tax financing and the decreasing share of regressive out-of-pocket payments. This is in line with O'Donnell *et al*. (2008), who showed that progressivity in financing could be achieved even with narrow tax bases. However, wider tax bases are much better in attaining progressivity and sufficiency of funding. This is in line with Akazili *et al*. (2011). They found that, despite the regressive informal sector contributions and out-of-pocket payments, the general taxes' progressivity drove Ghana's overall progressivity in its healthcare financing scheme. Thus, to extend coverage, countries should ensure that only progressive taxes entirely finance the initiative, and the funding pool needs to grow to enhance budgetary allocation to healthcare.

Consistent with Akazili *et al*. (2011, Lagomarsino *et al*. (2012) reported that broad tax sources and risk pools in African and Asian low and middle-income countries allowed for the gradual expansion of benefits packages, decreasing out-of-pocket payments and increasing government share of spending on health. Success was also underlined by an emphasis on purchasing services through demand-side financing mechanisms. This highlights the importance of demand-side interventions when designing financing structures and the broadness of tax sources. Atun *et al*. (2015), in a study of ten Latin American countries, found that broad tax-financed systems enabled the introduction of supply-side interventions, the extension of coverage to uninsured citizens and expanded benefits packages. However, these changes had to be combined with demand-side interventions to lower expenditure and pressure on funds.

Liaropoulos and Goranitis (2015) found that the shrinking share of labour relative to capital in most economies has reduced the sufficiency of wage income in financing healthcare. Without spreading NHIs and SHIs costs to all production factors, funding would not be sufficient, and these schemes would not be sustainable. This is consistent with Reeves *et al*. (2015), who found that increasing tax revenues is integral to achieving UHC, particularly in countries with low tax bases. Pro-poor taxes on profits and capital gains seem to support expanding health coverage. Progressive tax policies within a pro-poor framework might accelerate progress toward UHC. However, this is achievable speedily in countries where the decline in the labour share is a result of an increase in the capital share. Other counties that have seen their labour shares decline due to unemployment due to poor economic performance may find it difficult.

In other settings, funds raised may not match the scheme's expenditure level. For instance, Wang *et al*. (2017) reported that the Ghanaian scheme is financed from earmarked value-added tax, deductions from the social security trust and premium payments. However, the system has been in deficit since 2009 as coverage was expanded without a commensurate increase in the funds. The same issues have been noted in Taiwan due to rampant overuse of healthcare services, exceptionally low patient premiums and a relatively comprehensive health package that does not match the funds coming into the system (Lee *et al*., 2018). Under these circumstances, the central government must bear more financial burden and allocate additional funds to offset patient premium shortfalls. Yet, Taiwan’s overall GDP on health spending of 6.63 percent is lower than the 9.30 percent average in OECD countries.

The reviewed studies highlight that the sufficiency of funds is subject to a range of factors. For instance, the progressivity of funding sources differs (O’Donnell *et al*., 2008). Thus, the government may be constrained in choosing the source to use. The choice also depends on how much is needed (Wang *et al*., 2017; Lee *et al*., 2018). Raising funds is also subject to the objectives pursued in the respective schemes. Some sources of funds have more redistributive and equity effects than others (Van Doorslaer *et al*., 1999). Other sources confer more responsibility to the government than individuals and vice versa (Lim, 2004). Some sources may require complementary demand-side and supply-side reforms. Without them, funds would be insufficient to cover the population fully (Lagomarsino *et al*., 2012). Therefore, context-specificity in designing strategies to raise funds cannot be overemphasized.

ii. Literature on the purchasing of services in NHIs

The diversity of the factors that determine the success of efforts to raise sufficient funds in NHIs is matched by the diversity in the number of factors that determine the success of purchasing services in these schemes. One such factor examined is cost control. For instance, Yu (2015) reported that China prioritised coordination between insurance reform and their drug policy to control the growth of health expenditures in purchasing. This policy eliminated the perverse financial incentive to prescribe more expensive medicines. Price ceilings were also used to regulate the costs of services in the healthcare system. However, the study noted that China could have reduced costs further by moving from the fee-for-service payment method to capitation and diagnosis-group-adjusted payment systems. Thus, immense consideration must be put in when deciding the payment method for purchasing services.

Wang *et al*. (2017) reported that the expenditure control system in the Ghanaian NHI was too weak for the project to have long-term sustainability. Most of the expenditure claims exhibited patterns related to the scheme's design features that either encourage expenditure surges or are not adequate to limit them. These include the year-round open registration, which increased adverse selection for the scheme. The fee-for-service payment method also incentivised the oversupply of services, and the zero cost-sharing by patients reduced prudence in health-seeking behaviour. Further, the scheme lacked the mechanisms to control expenditure or monitor the effects of cost-containment policies and tools to monitor and correct providers' abnormal behaviours. Without such mechanisms and the feedback they are designed to provide, the design structure of the scheme is hard to improve.

Lee *et al*. (2018) reported that the insured population's excessive use of healthcare services in Taiwan was a critical problem in the NHI. A substantial number of insured Taiwanese sought inpatient and outpatient services over one hundred times a year. It was common for general practitioners or physicians to see fifty patients in a morning, spending only about five minutes for each consultation, which increased the need for more subsequent visits. The attempt to reduce expenditure by reducing reimbursement rates only threatened the long-term financial sustainability of the providers. The rapidly ageing population in Taiwan compounded the problem; the average healthcare expenditure per individual above the retirement age was over five times as much as those under that age. This shows that cost control has to be dealt with from multiple angles, with the scheme design being the most important.

The global budget, however, has helped the Taiwanese scheme from collapsing (Yip *et al*., 2019). However, it came at the expense of efficient service provision. Also, the prioritisation of cost control instead of the population needs led to the rapid growth of private insurance for excluded services and a two-tier system that compromised equity in Taiwanese. This is in line with a finding by Chen and Fan (2015) that, due to the global budget, Taiwanese hospitals increased treatment intensities to boost their service volume. As such, cost savings from the global budget disappeared while inefficiency increased. It is apparent from this case of Taiwan that there is a tradeoff that comes with any attempts to control costs without mechanisms that help control the health-seeking behaviour built into the scheme during its design. Not all funding issues can be fixed by setting a budget. Instead, behavioural change is critical.

Other studies examined the implications of benefits packages and coverage extension. For instance, Bärnighausen and Sauerborn (2002) reported that coverage and benefits were expanded over a prolonged period in Germany based on needs, values and the economy. Similarly, Kwon (2009) found that insurance coverage was gradually extended to the entire population over twelve years in the South Korean scheme. Van Ginneken (2010) found that coverage was extended through tailor-made approaches that adapted both the benefits packages and the contribution collection to specific population groups' needs in most countries. These progressively adaptive approaches contributed to the success and sustainability of these schemes as they allow for the mobilisation of resources and containment of expenditure. This is unlike in countries that introduced uniform benefits packages.

Tangcharoensathien *et al*. (2013) noted that Thailand introduced high-cost services at a later implementation stage even though it was financially possible to offer a comprehensive benefits package and extend coverage quickly in their NHI's preliminary stages. Bernales-Baksai and Solar-Hormazábal (2018) reported dynamic linkages between coverage, benefits packages, and financial protection in three Latin American countries. They emphasised the need for the harmonisation of benefit packages, financial protection, and equal opportunity of access to providers to avoid financing issues, as in South Korea, as reported by Kwon (2018). Therein, policy priority was given to coverage, with low contributions and limited benefits packages in

South Korea, which resulted in insufficient financial protection and a rapid increase in private-sector providers who threatened the financial sustainability of the NHI.

The third group of studies examined provider-payer systems and their impact on NHIs. For instance, Bärnighausen and Sauerborn (2002) found that multi-payer system in Germany, self-governance among the schemes enhanced the sustainability of funding and cost containment that would not have been achieved in a single-payer system. Rodwin (2003) examined the multiple French funds that operate as quasi-public entities wherein the government supervises the funds and has a network of local and regional funds that function as fiscal intermediaries in their locations. As in the German case, it was found that this setup has lessened the administrative burden of the scheme while enhancing the budgetary sustainability of healthcare financing in the country. The lower administrative burden may be attractive to countries beset with poor administrative capacity

Hutchison *et al*. (2011) found that a pluralistic system is better suited for transformation than Canada's single-payer system. Besstremyannaya and Simm (2014) found that the Czech Republic, Slovakian, and Russian governments managed to control costs in their multi-payer insurance systems. The respective governments prescribed the benefits packages, subscriber contributions, and provider reimbursement methods. These findings show that if the insurance schemes are structured well, the government can retain control and benefit from a pluralistic structure. However, insufficient financing and excessive regulation led to deficiencies. Mikkers and Ryan (2016) found increased contractual innovation, lower costs, enhanced performance and better healthcare outcomes in multi-payer systems. However, there were instances where payer incentives were misaligned with public policy objectives.

On the other hand, Cheng (2003) found that the single-payer system's efficiency allowed Taiwan to increase the utilisation rates with a negligible increase in total healthcare spending. This finding is in line with Hussey and Anderson (2003), who reported that single-payer designs offered governments higher control of costs. Cost control can, in turn, result in better health outcomes, as O'Neill and O'Neill (2008) reported in a comparison between the Canadian single-payer system and the United States multi-payer system. Clayton and Lines (2017) found that countries with a single-payer system have better overall health outcomes despite spending less per capita on healthcare. As Kwon (2009) reported in South Korea, efficiency in risk pooling, purchasing function and governance in the scheme could be responsible for improved health outcomes.

Petrou *et al*. (2018) found that the single-payer system performs better regarding healthcare equity, risk pooling, contract negotiation and administrative cost. Consistently, Cai *et al*. (2020) noted that by having a single-payer system, the United States could experience net savings, especially from simplified payment administration and lower drug costs. However, Fox and Poirier (2018) found that single-payer systems perform as well as any other model. The wide variation in outcomes across countries with single-payer systems suggests that no single, universal model for health financing suits every setting. Petrou *et al*. (2018) also did not find any differences in care quality between the single-payer and the multi-payer systems. So, it is possible that a single-payer system may be beneficial in other ways but without improving healthcare quality.

The fourth group of studies examined provider payment methods' implications for costs. For instance, Devlin and Sarma (2008) found that Canadian fee-for-service remuneration tended to increase healthcare expenditure due to physicians' greater quantity of healthcare services, some of which are unnecessary. Also, the fee-for-service method had higher administrative costs than its alternatives. This finding is consistent with Rudmik *et al*. (2014). They found that fee-for-service remuneration increased healthcare expenditure, which warranted rationing measures or user charges to curb unnecessary demand in Canada. Without the rationing measures, the expenditure levels would have been unsustainable. Wubulihasimu *et al*. (2016) also found that fee-for-service schemes increased healthcare output. However, this was not matched by any change in the quality of care in OECD countries.

Van Herck *et al*. (2010) found that the pay-for-performance method improved coordination, patient-centeredness and cost-effectiveness in NHIs. This is in line with Basinga *et al*. (2011), who reported that the method had the most significant effect on services with the highest payment rates in Rwanda, and Eijkenaar *et al*. (2013), who found that it was cost-effective and reduced inequalities in schemes from various countries. Kyeremanteng *et al*. (2019) also found that the approach could easily be tailored to provide financial incentives to the providers in Canada. However, the payment method has its pitfalls. For instance, it undermines risk-adjusted models and is highly susceptible to provider manipulation. There is also a risk of misusing or misinterpreting financial incentives (Kyeremanteng *et al*., 2019). It also has adverse spillovers on unincentivised care (Eijkenaar *et al*., 2013).

Capitation has also been evaluated in several studies. For instance, Suphanchaimat (2012) reported that it has been efficient and cost-effective in controlling supplier-induced demand in

Thailand. Rudmik *et al*. (2014) noted that the capitation method controls costs by eliminating the incentive for supplier-induced demand, reducing the quantity of care provided and overall healthcare expenditure. However, a cost reduction to society is only welcome if the reduction in supplier-induced demand does not lower productivity. Zhang *et al*. (2016) found that the capitation method narrowed health expenditure disparities across regions in the Chinese scheme. This enabled the country to improve its performance in its scheme despite the size of its population. Consistently, Andoh-Adjei *et al*. (2018) reported that the capitation payment method's use slowed growth in outpatient utilisation and claims expenditure in Ghana.

However, just like the two methods, the capitation method has shortfalls. One such is its susceptibility to adverse selection, as providers may be inclined to select healthier patients (Boachie, 2014). Due to shortfalls in all three, there have been calls for a blended approach with clearly specified risk-adjustment methods and benefits packages. This is in line with Hutchison *et al*. (2011), who found that the blended approach would be more suited for Canada's various healthcare levels. Babashahy *et al*. (2017) also found that no single payment method was universally suited for Iran's care levels to determine the providers' payment accurately. They recommended capitation, diagnosis-related and pay-for-performance and fee-for-service methods for primary, secondary, tertiary and outpatient care, respectively. While this blended approach may be administratively cumbersome, the effect on cost may be well worth it.

In sum, these studies on services purchasing indicate that various aspects must be considered when designing NHIs. These aspects include cost control mechanisms (Lee *et al*., 2018; Yip *et al*., 2019), benefits packages and coverage extension (Bernales-Baksai and Solar-Hormazábal, 2018; Kwon, 2018), provider payer systems (Petrou *et al*., 2018, Fox and Poirier, 2018; Cai *et al*., 2020) and provider payment methods (Wubulihasimu *et al*., 2016; Zhang *et al*., 2016; Babashahy *et al*., 2017; Andoh-Adjei *et al*., 2018; Kyeremanteng *et al*., 2019). The financing policy may be optimised to raise revenues for financing the scheme or pool funds to spread financial risk. However, it may still be inadequate in purchasing aspects, leading to failure. Therefore, context considerations in an integrated approach are vital.

Most studies reviewed above examined various essential aspects of financing NHIs by raising revenues from diverse sources and the expenditure costs from purchasing healthcare services. However, they fell short of examining the respective NHIs' affordability. Nevertheless, the aspects they examined are still of much value and insight to any study on the NHIs' affordability. This is especially true for this chapter's attempt to establish whether the South African NHI is affordable. The importance of these studies was also emphasized by the absence of details on most of the inputs required for more accurate projections of costs and revenues in determining the affordability of the impending NHI in South Africa. As such, these empirical studies provided a basis on which assumptions could be made with justification and scenario analyses could be conducted confidently.

4.2.3 Comparing South Africa to the international context

There are several possible differences between international experience in implementing NHIs and what South Africa might experience in implementing its NHI. For one, it is anticipated that the NHI will be implemented faster than in most international cases, such as in South Korea (Kwon, 2009) and Germany (Bärnighausen and Sauerborn, 2002) – full national rollout is expected by 2025 (NDoH, 2017). The state of healthcare in these countries before implementing their schemes may have been better than the current state of healthcare in South Africa, wherein reform is more of an emergency (Maphumulo and Bhengu, 2019). As alluded to above, the country faces a rising quadruple disease burden from deficient maternal, newborn and child health, communicable diseases, non-communicable diseases, and violence and injury. Inequalities and inequities are also rife in the system (Stull *et al*., 2016; Basu, 2018).

The government also intends to initially offer a comprehensive benefits package for all levels of care which the Benefits Advisory Committee will develop (NDoH, 2017). This is in contrast to the tailored and progressively adaptive approaches employed in European, Latin American, Asian and other African countries that have contributed to the success and sustainability of these schemes (Lagomarsino *et al*., 2012; Atun *et al*., 2015; Tangcharoensathien *et al*., 2013; Baksai and Solar-Hormazábal, 2018; Kwon, 2018). Countries like Thailand had the fiscal resources available but introduced some high-cost services later on after adjusting their schemes (Tangcharoensathien *et al*., 2013). Thus, South Africa risks experiencing high insurance coverage costs if it introduces unadaptable and uniform benefits packages that lack positive discriminatory qualities at the onset of the NHI implementation.

The government hopes that the efficiency gains of a single strategic purchaser and cost control mechanisms will offset the impact of demand and cost shocks and expenditure growth (NDoH, 2017). However, the efficiency gains may only be realised later when the scheme has had time to adjust. This is in line with schemes in countries like Thailand, Taiwan, China and South

Korea, which were adjusted and adapted to changing needs years after full implementation (Bärnighausen and Sauerborn, 2002; Tangcharoensathien *et al*., 2013; Chen and Fan, 2015; Yu, 2015; Kwon, 2018; Lee *et al*., 2018; Yip *et al*., 2019). The South African scheme will also face significant demand shocks, especially considering that high inequities, gross inequalities and a quadruple disease burden characterise the current healthcare system. As a result, the scheme might suffer from sustainability problems in its early years.

The single-payer is seen as the best regarding control, equity and solidarity in healthcare financing in South Africa (NDoH, 2017). As a single purchaser, the fund will proactively identify needs and the appropriate mechanisms for drawing on existing resources while attaining economies of scale and more substantial purchasing power (Blecher *et al*., 2019). However, the lack of multiple payers means South Africa will forego the benefits of multi-payer systems. The Czech Republic, Slovakia and Russia employed multi-payer approaches in their healthcare systems but still controlled many aspects (Besstremyannaya and Simm, 2014). According to Rugnath (2017), there are concerns that the administrative inefficiencies of public administration of a single fund covering the entire population may far outweigh the benefits. The inefficiencies may even be worse if cost-containment mechanisms are not in place.

Overall, South Africa has a unique set of issues that have significant implications on the NHI regarding how funds are raised, how funds are pooled and how services are purchased. These issues need careful consideration in the design and implementation of the NHI. However, despite this uniqueness in its setup, there is a wealth of experience that South Africa can rely on when making decisions, some of which is documented in the literature, part of which was reviewed above. Yet not all rationalisations in the same literature apply to the South African NHI due to the contextual uniqueness above. There is still a need to determine whether the NHI, as conceived, is affordable from a South African perspective. Also, the lack of consensus in some studies suggests that there is no universality regarding most healthcare issues. Accordingly, further examination is necessary from a South African context.

4.3 The method employed to determine the affordability of the scheme

From the literature reviewed above, it is evident that affordability is subject to various dynamic factors relating to raising funds, pooling funds and purchasing services. However, the absence of specific historical data on which to base the projections presented a challenge in the projection of the affordability of the NHI. Consequently, the study used assumptions based on the evidence on the current healthcare system to examine costs, revenues and overall affordability of the scheme. This reliance on assumptions in the calculation of base costs of coverage, total revenues to be raised, and their respective growth rates follow some methodologies employed by the NDoH (2017) itself and various other interested groups such as Econex (2010), Triangle project (2015), Davis tax committee (2017), People's health movement (2018) and the South African human rights commission (2019).

Assumptions are used when estimating revenues and costs of NHIs due to a lack of complete data, uncertainty, and the need to make future projections (Marseille et al., 2018). Health care costs are subject to significant uncertainty due to various factors, and assumptions are used to account for this uncertainty and provide a range of possible outcomes. Additionally, assumptions are used to make projections about how factors such as changes in technology, demographics, and health care policy may impact costs and revenues in the future. Sensitivity analysis also uses assumptions to identify the critical factors that affect the estimated costs and revenues of a national health insurance scheme, allowing for more informed decision-making (Gomersall, 2015). While assumptions can introduce some uncertainty, they are necessary for making informed projections and decisions in the face of incomplete or uncertain data.

Two approaches – a non-parametric comparative analysis and a Monte Carlo simulation – were then followed using these assumptions. In the first comparative approach, the intention was to determine the feasibility of raising enough funding to support the new level of expenditure in the first year of full implementation. In the Monte Carlo approach, simulations were run on costs, revenues and the difference to statistically determine the scheme's affordability over a more protracted period. These approaches were chosen based on the realisation that as healthcare needs grow, services become significantly more extensive, complex and costly (Wand, 2009). This brings about intrinsic uncertainty in planning, exacerbated by the uncertainty of healthcare demands and outcomes. The latter two warrant policies that are based on evidence of the potential to tackle these stochastic problems (Katsaliaki and Mustafee, 2011).

This can be achieved by simplifying the problem through non-parametric approaches. Alternatively, computer modelling can be valuable in solving the same complex problems for which the Monte Carlo simulation approach was employed (Wierzbicki, 2007). This approach also allows stakeholders to experiment with models representing real-world systems of interest (Katsaliaki and Mustafee, 2011). Subsequently, a scenario analysis was conducted. Per Lewis *et al*. (2018), it allows for identifying high-probability and high-impact changes as a basis for determining the feasibility of those changes. This is especially important for the changes in the NHI. This section describes revenue and cost projection approaches and the procedure employed in comparing the projected revenues and costs to determine the scheme's affordability.

4.3.1 The comparative approach to NHI revenues and costs

As mentioned above, the complexity of the problem at hand warranted simplification or complex computer modelling. This section describes the non-parametric comparative approach employed to simplify the problem – the revenue projections, the three approaches employed to project costs and the comparison of the projected revenues and the projected costs to determine the scheme's affordability.

i. Projection of the NHI's revenue

Affordability in most settings involves comparing costs and revenues over a certain period to determine whether the latter can cover the former. The same concept can be applied to the NHIs wherein the funds that the government raise through the scheme using various means, tax revenue predominantly, is compared to the costs incurred in providing healthcare services. If the revenues are lower than the expenditure level, such a scheme would be considered unaffordable, and vice versa. Regarding the NHI, however, comparing revenues and costs required forecasting both components because the scheme has not been fully implemented yet. Further, the scheme is not a once-off project; it is expected to remain in place well into the future. Thus, revenue and cost projections in this regard can be foundational to future projections of revenues and costs that facilitate the determination of affordability.

Affordability determinations of public initiatives entail examining revenue sources, such as national health accounts, to project the total amount that can be raised. These constitute the systematic, comprehensive and consistent monitoring of resource flows in a country's health system that provides a clear overview of the financial functioning of the healthcare system (Bui *et al*., 2015). The national health accounts identify the primary sources of finance, the consumers and providers of services, pinpoint the financial flows, break down the expenditures on health and map resource allocation (Magnoli, 2001). When conducted regularly, these accounts can help measure changes resulting from financing reforms (Waldo, 2018). Their usefulness in healthcare decision-making explains why WHO has been making efforts at the global level to produce national health account estimates for each country.

However, this approach has seen limited usage due to its various methodological challenges. These include poor comparability in revenue and expenditure classifications even when the same terminology is used (Bui *et al*., 2015). Further, national health accounts require revenues and expenditures to be allocated according to function, but the inadequacy of information makes that nearly impossible. Most agencies that operate in the healthcare system do not have systematic program budgeting and often do not differentiate by service type. At the same time, the organizational structure of budgets is a poor representation of functional breakdowns (Bagheri Lankarani *et al*., 2018). The third issue relates to the omission of coverage in some revenue and cost categories which can lead to low estimates. This is primarily the case with private estimates such as out-of-pocket medication purchases (Bui *et al*., 2015).

One alternative source of revenue information to the national health accounts, especially useful when aggregate data is sufficient in the estimation of affordability, is GDP estimates. GDP is the standard measure of the value-added in producing goods, the income earned from that production or the total amount spent on final goods and services (Decancq and Schokkaert, 2016; Feldstein, 2017). As some income goes towards the payment for healthcare services, the total healthcare spending of a country should be fundamentally related to its GDP (Reeves *et al*., 2014; Boserup *et al*., 2020). This association is consistent with the finding that global healthcare expenditure has risen with world income over the years (Rana *et al*., 2021). It is also consistent with the cross-country heterogeneity between high and low-income countries in terms of shares in global health expenditure (Ortiz-Ospina and Roser, 2017).

Many studies have established the link between GDP and healthcare expenditure estimates. For instance, Sülkü and Caner (2011) and Lago-Peñas *et al*. (2013) found a close to unity income elasticity of healthcare expenditure in Turkey and 31 OECD countries, respectively. Bedir (2016) found that per capita GDP was critical in explaining the difference in expenditures and growth among emerging market countries. This finding is in line with the current healthcare spending in South Africa of approximately 8.5 percent of GDP, which has significantly grown with income over the years (Micah *et al*., 2019). Behera and Dash (2017) reported a positive and significant impact of per capita GDP on the growth of public health expenditure in India. Other studies also employed GDP to directly forecast healthcare revenues (Jakovljevic and Getzen, 2016; Rana *et al*., 2020; Jakovljevic *et al*., 2020).

Thus, the South African GDP estimates were considered in this chapter's revenue estimations. Of note, not all income goes to healthcare spending. Studies show that health expenditure as a share of GDP ranges from less than 5 to 15 percent, with significant cross-country variation due to income, demographic and system differences (Keehan *et al.*, 2020; Kiross *et al.*, 2020; Rana *et al.*, 2020). However, comparing total income and the total expected healthcare expenditure can give an indication of affordability. Even at the household level, a ratio between the total healthcare spending by a household and its income can be used to determine whether or not the healthcare expenditure has become catastrophic (Cleopatra and Eunice, 2018; Azzani *et al.*, 2019; Zhao *et al.*, 2021). The same reasoning was applied herein to compare the total GDP to the expected cost of healthcare services.

The GDP estimates were accessed from the World Bank's data portal. These are at the purchaser's prices, looking at the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (World Bank, 2022). The World Bank provides the estimates in both the US Dollar and the South African Rand. Rand values were used to avoid the issues regarding the choice of exchange rates and the cumbersomeness of determining the exchange rates applied to foreign exchange transactions. Further, the GDP growth rates were also accessed from the World Bank's data portal. These are defined as GDP's annual percentage growth rates at market prices based on constant local currency (World Bank, 2022). The average year-on-year growth rates in total GDP allowed for the GDP projections to be made.

It should be noted that as not all income goes to healthcare, some studies employ national budget allocation to determine future healthcare revenues (Barasa *et al.*, 2015; Mbau *et al.*, 2018; Paramita *et al.*, 2018; Casasnovas, 2019; Fahim *et al.*, 2019). However, budgetary allocations are discretionary and subject to national policies, strategies and plans, as well as macroeconomic factors such as fiscal deficit and debt payment (Ke *et al.*, 2011; Behera and Dash, 2019). Therefore, healthcare budg*et* allocations may not be as dependable when forecasting healthcare revenues, especially for a scheme that has not been implemented yet. Therefore, the alternative to GDP estimates and healthcare budgetary allocations has been the examination of aggregate tax revenue to forecast future healthcare expenditure (Liaropoulos and Goranitis, 2015; Reeves *et al.*, 2015; Uzochukwu *et al.*, 2015; McIntyre *et al.*, 2018).

Aggregate tax revenue estimates have a stronger association with healthcare spending. For instance, Ortiz-Ospina and Roser (2017) and Behera and Dash (2017) found a more robust and positive association between healthcare expenditure and tax revenues relative to GDP. These findings align with Fan and Savedoff (2014) and Reeves *et al.* (2015). They argued that the mobilization of funds through domestic tax revenue is more indicative of healthcare financing than GDP estimates. They are also consistent with the distinction between GDP performance and tax revenue performance drawn by Gupta (2007). The author argued that, in addition to total GDP, factors such as agriculture share in GDP, trade openness corruption, political stability, the share of direct and indirect taxes and foreign aid significantly affect the revenue performance of an economy.

Tax revenue estimates, while less specific than budgetary estimates, do not change drastically from year to year like the latter (Govender *et al.*, 2021; Omotoso *et al.*, 2021). Thus, revenue projections based on tax revenues may be more robust than projections based on budgetary allocations. Revenues could also have been estimated based on the specific sources the government plans to use in the scheme. However, as has been pointed out, the white paper (2017) contains no definitive statement on the sources of funds (Nevondwe and Odeku, 2014). There are no specific details about how the scheme will be financed beyond some tax scenarios presented as options for funding the NHI shortfall. It is, thus, not surprising that the most controversial aspect of the NHI has been the source of funds (Nevondwe and Odeku, 2014; Ataguba, 2016; Omarjee, 2018; Gilson, 2019; Michel *et al.*, 2020).

Accordingly, tax revenue and aggregate GDP estimates were considered in determining the affordability of the NHI for robustness. Although the World Bank data portal also has tax revenue estimates, the tax revenue figures from the South African Revenue Services (SARS, 2021) were used. This was because the SARS figures contain disaggregated totals for all the main direct and indirect tax instruments. Such breakdowns would allow for the abstract evaluation of the tax scenarios in the white paper (2017). Table 4.1 below presents SARS's (2021) direct, indirect, and total tax revenue for the past five years. Using five years allowed for determining historical growth rates in each instrument, as shown in the table. The same table also contains the annual totals of GDP and the respective annual growth rates.

Personal income tax is the largest direct source and has the highest average growth rate of 7.98 percent. In tax-financed systems, personal income tax is usually one of the instruments used to finance healthcare (Cleverley and Cleverley, 2017), primarily due to its progressivity (Ataguba and McIntyre, 2018). However, personal income tax revenue fell short of the 2019 budget forecast, in line with moderating real wage growth in the economy (SARS, 2021). The covid-

19 pandemic may have also contributed to that shortfall as economic activity was significantly affected (McKibbin and Fernando, 2021). Among the indirect sources, the value-added tax had the lowest growth rate of 5.42 percent due to the acceleration of payments of VAT refunds and less VAT on imports (SARS, 2020). This is concerning, considering that VAT is the broadest, least distortionary and second-largest tax revenue source in South Africa (NDoH, 2017).

. Table 4. 1 Tax revenues, GDP amounts, and growth rates in South Africa

Tax source		2015/16	2016/17	2017/18	2018/19	2019/20	Average R'000 000
		R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	
Direct revenue sources	PIT	389280	425924	462903	493829	529172	460221.60
			9.41%	8.68%	6.68%	7.16%	7.98%
	CIT	193385	207027	220239	214388	214986	210005.00
			7.05%	6.38%	-2.66%	0.28%	2.76%
	STC	23 934	31 130	27894	29898	27930	28157.20
			30.07%	-10.40%	7.18%	-6.58%	5.07%
	Other	17 558	17 660	19 704	19 662	19 083	18733.40
			0.58%	11.57%	-0.21%	-2.94%	2.25%
Indirect revenue sources	VAT	281111	289167	297998	324766	346761	307960.60
			2.87%	3.05%	8.98%	6.77%	5.42%
	Fuel	55 607	62 779	70 949	75 372	80 175	68976.40
			12.90%	13.01%	6.23%	6.37%	9.63%
	Customs	46 250	45 579	49 152	37 902	55 428	46862.20
			-1.45%	7.84%	-22.89%	46.24%	7.44%
	Excise	35 077	35 774	37 356	40 830	55 428	40893.00
			1.99%	4.42%	9.30%	35.75%	12.87%
	Other	27 779	29 042	30 271	51 043	26 802	32987.40
			4.55%	4.23%	68.62%	-47.49%	7.48%
Total tax revenue		1 069 983	1 144 081	1 216 464	1 287 690	1 355 766	1214796.80
			6.93%	6.33%	5.86%	5.29%	6.10%
GDP		3064237	3076466	3119983	3144539	3149337	3110912.40
			0.40%	1.41%	0.79%	0.15%	0.69%

Source: South African Revenue Services (2020) and World Bank (2021)

The overall tax revenue has also been growing at a decreasing rate, from 6.93 percent in 2016/17 to 5.29 percent in 2019/20. The tax buoyancy ratio for 2019/20 was also down from 1.31 to 1.10. Revenue collection risks remained heavily on the downside as the economy faced many headwinds (SARS, 2020; ADB, 2021). The poor economic performance is further highlighted by the 0.69 percent GDP growth rate over the past five years. Surprisingly, total tax revenue grew by 6.10 percent in that same period. However, according to the OECD (2018), tax revenues rise and fall faster than GDP. It may also have resulted from the increasing public expenditure as the South African government spent R1.71 trillion in 2017/18, R116 billion more than the R1.59 trillion spent in 2016/17 (StatsSA, 2019). This may explain the significantly different GDP and tax revenue growth rates

Overall, tax and GDP trends are concerning as introducing such massive reforms as the NHI requires enormous sums of funds to be available immediately (Passchier, 2017). Looking at most Asian and Latin American countries that successfully implemented similar reforms highlights this concern. Unlike South Africa, most of these countries had broad and progressive tax revenue sources that could support the new level of healthcare services demand (Lagomarsino *et al*., 2012; Atun *et al*., 2015; Reeves *et al*., 2015). Relying on regressive and narrow tax sources may expose the South African scheme to funding risks. This has been the case in the Taiwanese scheme due to low patient premiums that are insufficient to fund the comprehensive health services provided (Lee *et al*., 2018). Without commensurate revenue growth to match the growth in demand, Taiwan's funding deficit was inevitable.

ii. Projection of the costs of healthcare services in the NHI

As alluded to above, revenue and cost projections had to be made to determine the affordability of the NHI. For the latter, a distinction had to be made between cost types. For instance, with the NHI, there are non-recurrent costs relating to the scheme's development and the healthcare system's preparation. Three phases have and will see substantial funds spent in this regard (NDoH, 2018). The total funds spent so far can be easily computed from the amounts allocated to the NHI in the national budget. For instance, the national treasury allocated R150 million for the 2012/13 fiscal year to assess innovations necessary for implementing the NHI (PMG, 2013). Another R166 million was added to the NHI indirect grant, which focuses on health facility revitalisation to procure medical equipment and design a new academic hospital in Limpopo (National Treasury, 2018). Pilot facilities and districts have also received millions.

However, these costs were considered sunk because they occurred or will occur before the scheme's full implementation in 2026. This follows numerous studies (Danson *et al*., 2005; Baldwin and Robert-Nicoud, 2007; Coiera, 2011; Huckfeldt *et al*., 2013; Duijmelinck *et al*., 2015). The focus was on the recurrent coverage costs, which allowed for a comparison with projected revenues. It is accepted that the feasibility of the NHI is heavily dependent on cost control mechanisms and fiscal spending rules that can ensure that spending is proportional to the resources available. However, as in the case of revenues, the details on coverage costs are scant in the white paper (2017). Thus, three population-based methods for determining costs suggested by Econex (2010) were employed to estimate these costs and these methods are described below.

(a) Using historical healthcare spending to project NHI costs

In the first alternative, the study relied on the historical expenditure computed from the total GDP and healthcare expenditure as a percentage of GDP. According to the World Bank (2022), estimates of current health expenditures include healthcare goods and services consumed each year in both public and private sectors. Including public and private spending in these projections was considered necessary as health services paid for from the fund will be provided to patients in public and private facilities (Passchier, 2017; Solanki *et al*., 2020). This indicator does not include capital health expenditures, most of which count as sunk costs. This figure was then adjusted to consider the growing healthcare expenditure in South Africa from 2010/2011 to 2019/2020. The ten-year estimation period allowed for the observation of expenditure trends and the year-on-year growth rate necessary for making projections.

From Table 4.2, the average expenditure as a percentage of GDP ranged from 7.42 percent in 2010 to 8.31 percent in 2020 (an annual average of 7.96 percent and a growth rate of 8.18 percent). In the same period, GDP grew by 1.55 percent annually. This trend is consistent with low-income elasticities in healthcare expenditures in several emerging market countries (Baltagi *et al*., 2016; Rana *et al*., 2020). Per Bustamante and Shimoga (2018), low- and middle-income countries' less-than-one health expenditure income elasticity equals high-income countries. This indicates the necessity of healthcare (Rana *et al*., 2020; Ganyaupfu, 2020). South Africans already spend a considerable portion of their income on healthcare, as shown by their high out-of-pocket payments (Koch and Setshegetso, 2020). So, the weak association between the two estimates may be more of a comovement issue than causality.

Government expenditure on healthcare may be kept constant regardless of the size of the fiscal envelope. This is especially true in South Africa. Further, more than 40 percent of South African healthcare expenditure is privately financed, a financing source that is even less sensitive to income growth (Jakovljevic, 2016). This could be due to the negligible positive redistributive effects and lesser differential treatment of public financing relative to private financing (Van Doorslaer *et al*., 1999). It is in line with how South Africa compares to other emerging markets such as Brazil, Russia, India and China (BRIC). These countries have seen their percentage share of global health spending continually rising (Jakovljevic and Getzen, 2016). This is despite having no rapid changes, as Figure 4.2 shows, in how much these countries spend on healthcare as a percentage of their respective GDPs.

Table 4. 2 Historical healthcare spending and growth rates of BRIC countries

Year	GDP (Total)	Healthcare (% of GDP)	Healthcare (Total)	Healthcare (% growth)	GDP (% growth)
2010	2748008340900	7.42%	203774553297	13.98%	3.04%
2011	3023659092800	7.50%	226693316560	10.09%	3.28%
2012	3253851855400	7.75%	252256511539	10.84%	2.21%
2013	3539976984000	7.72%	273320262521	8.03%	2.49%
2014	3805349576300	7.93%	301769930567	9.75%	1.85%
2015	4049884000000	8.20%	332127056023	10.59%	1.19%
2016	4359060000000	8.10%	352901545367	6.28%	0.40%
2017	4653579000000	8.11%	377550408079	6.92%	1.41%
2018	4873899000000	8.25%	402263395299	7.33%	0.79%
2019	5077625040900	8.31%	422038099774	4.06%	0.15%
2020	5373905732720	8.31%	446505427438	1.29%	0.28%
Average	4068981693002	7.96%	326472773315	8.18%	1.55%

Source: World Bank (2021)

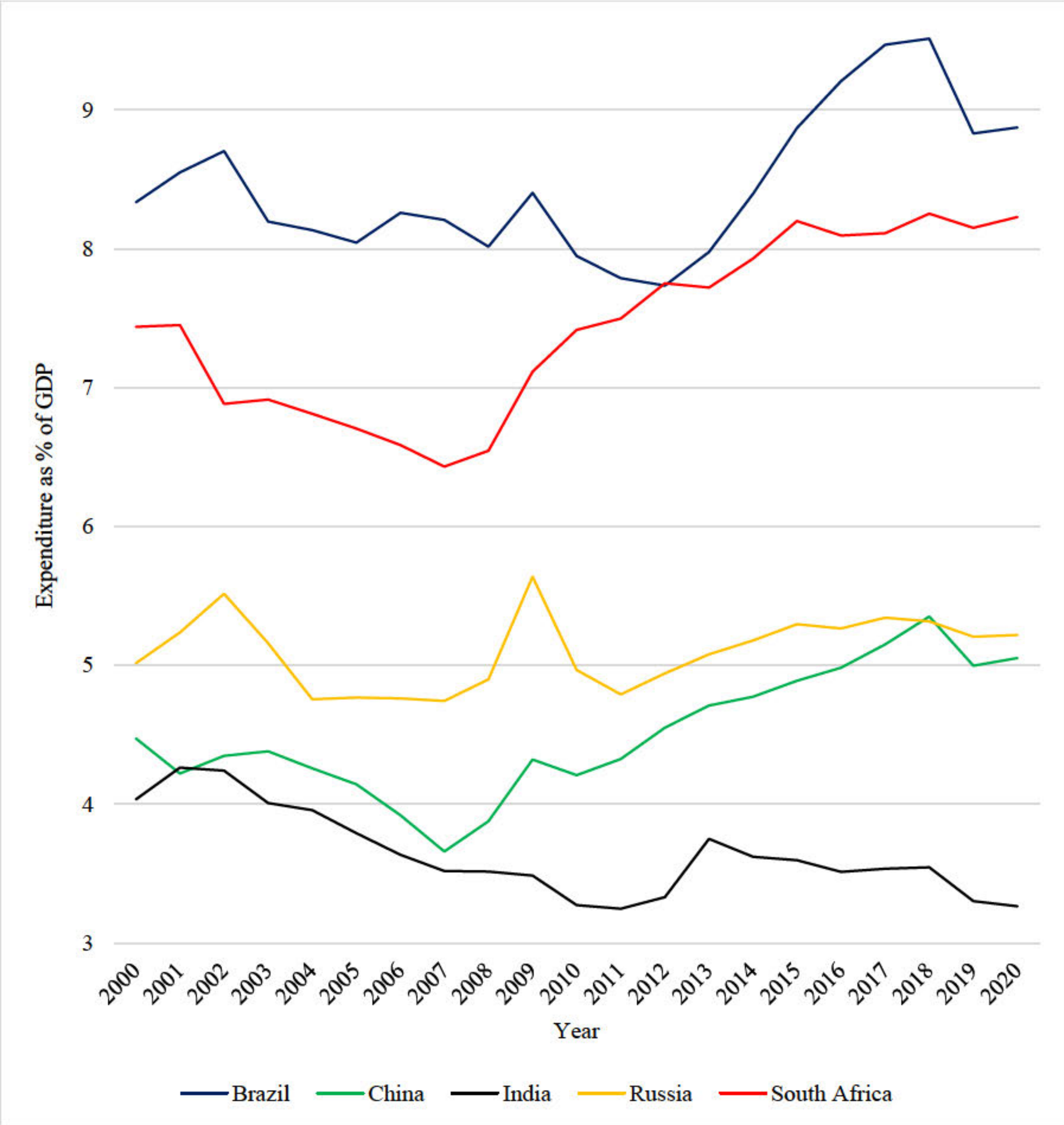


Figure 4. 2 A comparison of healthcare expenditures as percentages of GDP

Source: World Bank (2022)

Healthy growth in their respective GDPs over the recent decades means that their share of global healthcare spending was going up even when their healthcare spending as a percentage of their GDPs was not changing by much. However, there may be significant changes in expenditure patterns in South Africa once the NHI is implemented. The scheme seeks to ensure that healthcare is free at the point of service (NDoH, 2017). Further, its early years are likely to be typified by poor cost controls and inefficiencies. The lack of a fiscal rule that links spending in the scheme to the available resources means that expenditure may spike once the scheme is introduced (Omarjee, 2018). Even with the rationing factors such as long waiting times and public and private sector differences in service quality, expenditure as a percentage of GDP may go up significantly, especially if the GDP is not growing (Econex, 2010).

(b) Using the government's scheme to project NHI costs

Expenditure projections for an impending scheme can be challenging, so using more than one approach can improve the robustness of estimations. Therefore, the government employees' medical scheme (GEMS) was also examined. From the white paper (2017), the government aims to provide comprehensive benefits packages. However, there is no clarity about what those entail. In this analysis, GEMS was taken as what the government might consider as comprehensive. Further, per Goudge *et al*. (2018), voluntary social health insurance schemes like GEMS are attractive to policymakers because they generate additional funds and provide more significant benefits for the formally employed. It is the largest restricted medical scheme and the second overall after Discovery Health. As of 2020, the scheme had 713646 members and 1.856 million beneficiaries (Businesstech, 2020).

Accordingly, the average cost per member and the growth rate on the six options offered in GEMS from 2017 to 2020 were calculated based on the data accessed from the scheme's website (GEMS, 2021). Table 4.3 below shows the premiums and the total average premium for the six options under GEMS. Over the past five years, the average cost of cover from all the options was R4194 per member per period – an 8 percent growth over these five years. The figure of R4194 is lower than the monthly premiums of comprehensive cover on South Africa's two most prominent open medical schemes – R7688 and R7715 for Discovery and Bonita's medical aid schemes, respectively – but may be more representative of the cost per individual in the NHI. These figures were used to calculate the 2026 baseline for the NHI's average annual cost. The resulting cost figure was then adjusted in scenario analysis.

Of note, the NHI may be vastly different from the GEMS. Despite GEMS having a non-contributory option, affording its members access to privately provided primary care and many other benefits, most government employees in the socio-economically vulnerable and lowest salary category remained uninsured. Unaffordability continues to play a role in its poor coverage of the lower salary categories. On the other hand, the NHI scheme is compulsory, implying that it will have better coverage than GEMS (NDoH, 2018). Further, the government scheme's introduction in 2005 signalled a change of priority from improving the public sector to access to private-sector care for government employees (Goudge *et al*., 2018). However, the NHINHI has a different orientation. Its goal is to remove the current healthcare system's inequities institutionalised within the country's financing system (NDoH, 2017).

Table 4. 3 GEMS options premiums per medical scheme member

Option	2017	2018	2019	2020	2021	Option average
Tanzanite One	1534	1671	1776	2082	2082	1829
Beryl	1966	2145	2294	2620	2620	2329
Ruby	3535	3865	4150	4745	4745	4208
Emerald Value	3564	3825	4005	4475	4475	4069
Emerald	3959	4328	4674	5338	5338	4727
Onyx	6450	7180	7919	9232	9232	8003
Annual average	3501	3836	4136	4749	4749	4194
Average annual growth rate						8%

Source: Government Employees' Medical Scheme (2021)

(c) Using low-cost medical schemes to project NHI costs

A third approach was employed to improve the robustness of cost projections. In this approach, the study assumed that the NHI's benefits package might match the prescribed minimum benefits in the low-cost medical schemes in South Africa. According to Econex (2010), this method implicitly assumes that specific statistics such as the number of health visits, admissions to hospitals, prescription of medication, unit costs of treatment, and behaviour of both patients and suppliers would be the same between the low-cost medical schemes and the NHI. This is because the South African government promised a comprehensive benefits package, and the funds required to fund the healthcare expenditure that would ensue might be beyond South Africa's reach. So, the low-cost schemes may be a good reflection and benchmark of what is likely to be offered, at least in the scheme's early years.

This approach is in line with the low-cost benefits packages initially offered in Germany, South Korea and Thailand during the early years of their respective schemes (Bärnighausen and Sauerborn, 2002; Kwon, 2009; Tangcharoensathien *et al*., 2013). Thus, the study calculated the average annual premiums of the three lowest-cost medical schemes in South Africa from 2011 to 2020. Of note, contributions have grown faster over the past ten years than the average consumer price index (CMS, 2020). Thus, the study computed the average contribution increase and used it to determine the base cost figure for 2026. Table 4.4 below shows the average premiums of the schemes - Medihelp unify, Genesis private plus and Discovery health essential saver. The average premium across the three schemes was R1805.00 per annum, and the average contribution increase over the same period was 9.50 percent.

As in the approach above that employed the GEMS data, the low-cost medical schemes estimates were taken with significant reservations due to proneness to understating the actual cost of the NHI. This approach does not consider the full impact of the factors at work in the health system and the imminent change in health-seeking behaviour (Econex, 2010). Further, the private medical scheme industry differs significantly from the public sector. Private schemes also lack any form of income cross-subsidy, risk equalisation mechanisms and mandatory membership that the NHI will bring with it (Ramjee and Vieyra, 2014). It is also not built on a foundation of social solidarity. As such, there is no incentive for innovation. It also exposes this industry to incumbency and increasingly unaffordable and unsustainable cover. The NHI seeks to solve this in the healthcare system.

Despite their notable weaknesses, the three approaches described above provide valuable benchmarks of the coverage costs, further fortified by their simultaneous employment. Further, the study required three cost figures and three growth rates to execute Monte Carlo simulations based on random triangular distributions, as described in the following section. Other more sophisticated methods, such as actuarial costing and demand-based methods, could have been used in running the same simulations (Econex, 2010). However, these alternatives have more significant and sophisticated data requirements beyond the reach of this analysis. For instance, the actuarial costing method requires information on the complete set of diagnosis-treatment pairs. On the other hand, the demand-based method requires information on the utilisation rates of all services (Calikoglu and Bond, 2008).

Table 4. 4 Low-cost medical schemes premiums and the growth rate

Medical aid scheme	Average premium
MediHelp Unify	R1752
Genesis Private Plus	R1800
Discovery Health Essential Saver	R1862
Average premium	R1805
Average contribution increase	9.50%

Source: Council for Medical Schemes (2020)

iii. The comparison of revenues and costs

Following the revenues and costs projections, the next step was to compare the two to determine the affordability of the NHI in its first year of implementation. Tables 4.5, 4.6 and 4.7 below contain the estimated figures for potential revenue sources – total direct and indirect tax revenue, tax revenue and GDP for 2020/2021. The tables also contain the respective growth rates of each source of revenue used to project the 2020/2021 figures to 2026. What differentiates one table from the other are the projected costs of coverage calculated using either of the three cost projection approaches described above and the projected growth rate of each approach's costs. As mentioned above, affordability determination, in this case, involved comparing the costs and potential income. Therefore, the projected base cost was expressed as a percentage of each revenue source, total tax revenue and GDP.

Finally, the tables also contain figures termed best-case, medium-case, and worst-case scenarios – a form of sensitivity analysis. As long as there is missing cost information on the NHI, any projections will have to rely on assumptions and sensitivity analyses. Therefore, as a way of accounting for this lack of vital cost information, arbitrary adjustments of -10 percent (10 percent downwards adjustment, termed the best case), +10 percent (10 percent upwards adjustment, termed the medium case) and +20 percent (20 percent upwards adjustment, termed as the worst case) were applied to the base case figure from the three cost projection approaches. The resulting three additional cost figures were then expressed as percentages of each tax direct and indirect tax revenue source, the total tax revenue, and GDP, just as in the base case scenario.

The base case scenario costs from the three approaches are 19.29 percent, 16.90 percent and 8.60 percent of GDP, respectively, for 2026. While the first two figures represent a significant departure from the current expenditure of 8.40 percent of GDP, they may be more realistic. This is because the significant inadequacies in the healthcare system, such as a quadruple disease burden and gross inequities, among others, may cause a spike in service demand (Passchier, 2017; McIsaac, 2019). The expectation of a meaningful change in healthcare-seeking behaviour among the beneficiaries of the NHI aligns with this assertion. Further, supplier-induced demand and poor cost controls, in line with the poor administrative capacity threat noted in Chapter 2, may add to the cost shocks, and the shocks may persist until the scheme's administrators have made some design adjustments (Wang *et al*., 2017).

There is a counterargument that reorganising healthcare through the NHI will result in significant cost savings due to improved efficiency. The current expenditure is inequitably distributed in a two-tier system (Mofokeng *et al*., 2020), and the expectation is that once the scheme is implemented, the distributions will improve (NDoH, 2017). As such, a modest increase from the current level of expenditure may be possible even if the expenditure in the public sector increases considerably. The increased expenditure will be offset by redistributing resources across the two sectors and the efficiency gains. This was the case in Taiwan. The introduction of the single-payer healthcare system allowed for increased utilisation rates among its population but with a negligible increase in total spending from 5.29 percent to 5.44 percent of GDP due to efficiency gains and cost controls (Cheng, 2003).

However, the Taiwanese healthcare system and its demographics were vastly different from the current healthcare system status and demographics in South Africa. Further, too much prioritisation of cost controls over the population's needs may entrench inequities, as in South Korea and Taiwan. The emphasis on cost savings resulted in the rapid growth of private-sector providers who threatened NHIs' financial sustainability due to profit-seeking behaviour (Kwon, 2018; Yip *et al*., 2019). Further, the efficiency gains that the government might be counting on may only set in later as the first few years will be spent trying to ensure efficiency is realised. This may be why countries with far more robust fiscals, such as Germany, South Korea and Thailand, decided to gradually introduce their schemes (Bärnighausen and Sauerborn, 2002; Kwon, 2009; Tangcharoensathien *et al*., 2013).

Looking at the tax revenues, the estimated costs from each approach constitute 35.99 percent, 31.52 percent and 15.38 percent, respectively. The costs from the first two approaches are close to the current average of 30.70 percent, but the figure from the third approach suggests that low-cost medical aid schemes' premiums are not reflective of actual costs of care. Perhaps mid-range medical aid schemes would have been a better representation. From the first two cases, the healthcare expenditure would only increase by 5.29 percent and 0.82 percent of the tax, respectively. If this is the case, then perhaps the scheme might be affordable. However, this conclusion assumes that tax revenues will continue growing at the same rate, which is unlikely, given the current state of the economy. Production and economic activity slowed considerably in South Africa due to the pandemic, and the outlook is negative (Stiegler and Bouchard, 2020).

At the height of the pandemic, GDP fell a fifth year-on-year, causing a plunge of real GDP to 2007 levels (Financial Times, 2020; Africa Report, 2020). Power cuts also continue to discourage economic growth. There are other concerns regarding the sufficiency of tax revenues. First, according to Van Doorslaer *et al*. (1999), public finance sources have negligible positive redistributive effects and lesser differential treatment than private finance sources. Secondly, Liaropoulos and Goranitis (2015) found that reducing labour share relative to capital in most economies has reduced the sufficiency of wage income in financing healthcare. For South Africa, unemployment is the problem. Thirdly, Lagomarsino *et al*. (2012) argue that tax sources must be broad to broaden risk pools and expand benefits packages and coverage. For South Africa, most sources are either insufficiently broad or regressive.

Thus, the NHI may be unaffordable. There seems to be a need for an additional direct earmarked tax – which should be sufficiently broad to ensure sufficient funds are collected and progressive to improve equity. This hypothecation of tax is integral to achieving universal health coverage in low and middle-income countries, particularly in countries with low tax bases (Reeves *et al*., 2015). This is in line with evidence from Thailand, where a similar effort resulted in more equitable financing, low catastrophic health expenditure incidence and pro-poor subsidy distribution (Limwattananon *et al*., 2011). South Africa has a low tax base, and a direct tax with similar progressivity as the personal income tax may be helpful. South Africa might have a similar experience to Singapore, where wealthier citizens were content with paying for healthcare if a higher level of services was guaranteed (Lim, 2004).

Focusing on personal income tax (PIT) and value-added tax (VAT), the coverage costs' massive size becomes much more apparent. The projected costs from the three approaches constitute 84.46 percent and 145.31 percent, 73.97 percent and 127.27 percent and 36.10 percent and 62.11 percent of PIT and VAT, respectively. These figures, particularly those from the first two approaches, are concerning because personal income tax is progressive but not broad. In contrast, the value-added tax is broad but not progressive in South Africa. This feeds into the low progressivity of the overall taxes, worsened by the indirect taxes' regressivity (Ataguba and McIntyre, 2018). However, despite the apparent insufficiency to cover healthcare costs, the characteristics of tax instruments accord with the NDoH (2017) suggestion that they might use a surcharge on personal income tax and increase value-added tax to finance the scheme.

As alluded to above, the estimation of NHI revenues and costs remains a challenging issue. As a result, different figures have since been published by the NDoH and other interest groups. So, the -10 percent, +10 percent and +20 percent adjustments applied to the estimated figures were warranted. As a percentage of GDP, the costs from the three approaches after the adjustments amounted to 17.36 percent, 21.22 percent and 23.15 percent, 15.21 percent, 18.58 percent and 20.27 percent, and 7.74 percent, 9.46 percent and 10.32 percent, respectively. As has been alluded to before, the third approach's projections understate the coverage costs that should be expected. However, the first two approaches still show a substantial increase in expenditure - nearly 9.36 percent and 7.21 percent increase, respectively, from the current 8 percent, even with a -10 percent adjustment.

The differences became even more pronounced when +20 percent was applied. Coverage costs amounted to R787 275 553 174 in the first approach and R689 555 379 504 in the second approach. This represents 23.15 percent and 20.27 percent of GDP and 43.19 percent and 37.83 percent of total tax revenues, respectively. These amounts are astronomical, massive departures from the R256 billion shortfalls estimated by the NDoH (2020) and closer to the R1 trillion once mentioned by the former Minister of Health, Dr Aaron Motsoaledi. It might not be possible to operate a scheme requiring such resources. That is, taken all together – the GDP growth, the tax revenue projections and the expected increase in the utilisation of healthcare services – the scheme seems unaffordable for South Africa under such circumstances. Significant adjustments in the scheme's design must be made.

Table 4. 5 Affordability based on revenues and historical expenditure

Tax source		Current estimated total	Estimated growth rate	2026 estimate based on the growth rate	Cases expressed as a percentage of tax revenue or GDP			
					Base	Best	Medium	Worst
					656062960978	590456664880	721669257076	787275553174
Direct revenue sources	PIT	529172000000	7.98%	776807610985	84.46%	76.01%	92.90%	101.35%
	CIT	214986000000	2.76%	246337572450	266.33%	239.69%	292.96%	319.59%
	STC	27930000000	5.07%	35765524389	1834.34%	1650.91%	2017.78%	2201.21%
	Other	19083000000	2.25%	21328643424	3075.97%	2768.37%	3383.57%	3691.17%
Indirect revenue sources	VAT	346761000000	5.42%	451487058468	145.31%	130.78%	159.84%	174.37%
	Fuel	80175000000	9.63%	126965591169	516.73%	465.05%	568.40%	620.07%
	Customs	55428000000	7.44%	79352242891	826.77%	744.10%	909.45%	992.13%
	Excise	55428000000	12.87%	101536416881	646.14%	581.52%	710.75%	775.36%
	Other	26802000000	7.48%	38441957272	1706.63%	1535.97%	1877.30%	2047.96%
Total tax revenue		1355766000000	6.10%	1822895017762	35.99%	32.39%	39.59%	43.19%
GDP		3149337000000	1.55%	3401095088733	19.29%	17.36%	21.22%	23.15%

Source: Author's own estimations (2022)

Table 4. 6 Affordability based on revenues and GEMS premiums.

Tax source		Current estimated total	Estimated growth rate	2026 estimate based on the growth rate	Cases expressed as a percentage of tax revenue or GDP			
					Base	Best	Medium	Worst
					574629482920.38	517166534628.34	632092431212.41	689555379504.45
Direct revenue sources	PIT	529172000000	7.98%	776807610985	73.97%	66.58%	81.37%	88.77%
	CIT	214986000000	2.76%	246337572450	233.27%	209.94%	256.60%	279.92%
	STC	27930000000	5.07%	35765524389	1606.66%	1445.99%	1767.32%	1927.99%
	Other	19083000000	2.25%	21328643424	2694.17%	2424.75%	2963.58%	3233.00%
Indirect revenue sources	VAT	346761000000	5.42%	451487058468	127.27%	114.55%	140.00%	152.73%
	Fuel	80175000000	9.63%	126965591169	452.59%	407.33%	497.85%	543.10%
	Customs	55428000000	7.44%	79352242891	724.15%	651.74%	796.57%	868.98%
	Excise	55428000000	12.87%	101536416881	565.93%	509.34%	622.53%	679.12%
	Other	26802000000	7.48%	38441957272	1494.80%	1345.32%	1644.28%	1793.76%
Total tax revenue		1355766000000	6.10%	1822895017762	31.52%	28.37%	34.68%	37.83%
GDP		3149337000000	1.55%	3401095088733	16.90%	15.21%	18.58%	20.27%

Source: Author's own estimations (2022)

Table 4. 7 Affordability based on revenues and low-cost medical schemes premiums.

Tax source		Current estimated total	Estimated growth rate	2026 estimate based on the growth rate	Cases expressed as a percentage of tax revenue or GDP			
					Base	Best	Medium	Worst
					280426221419.21	252383599277.29	308468843561.13	336511465703.05
Direct revenue sources	PIT	529172000000	7.98%	776807610985	36.10%	32.49%	39.71%	43,32%
	CIT	214986000000	2.76%	246337572450	113.84%	102.45%	125.22%	136,61%
	STC	27930000000	5.07%	35765524389	784.07%	705.66%	862.48%	940,88%
	Other	19083000000	2.25%	21328643424	1314.79%	1183.31%	1446.27%	1577,74%
Indirect revenue sources	VAT	346761000000	5.42%	451487058468	62.11%	55.90%	68.32%	74,53%
	Fuel	80175000000	9.63%	126965591169	220.87%	198.78%	242.95%	265,04%
	Customs	55428000000	7.44%	79352242891	353.39%	318.05%	388.73%	424,07%
	Excise	55428000000	12.87%	101536416881	276.18%	248.56%	303.80%	331,42%
	Other	26802000000	7.48%	38441957272	729.48%	656.53%	802.43%	875,38%
Total tax revenue		1355766000000	6.10%	1822895017762	15.38%	13.85%	16.92%	18.46%
GDP		3149337000000	0.69%	3259498907444	8.60%	7.74%	9.46%	10.32%

Source: Author's own estimations (2022)

4.3.2 Monte Carlo simulation and analysis of revenues and costs

In most nations, healthcare systems have become increasingly complex (Oleribe et al., 2019). Together with the inherent, intrinsic uncertainty of healthcare demands and outcomes, policy evaluations have become intricate as well. Many deterministic models that can be used to examine the aspects, such as affordability and sustainability of projects, are more suitable for use in a system where relationships among the variables are fixed (Geberemariam, 2018; Elmousalami, 2019). However, the process would be cumbersome due to the stochasticity of variables in the health system. Computer modelling using techniques such as the Monte Carlo simulation can cope with such stochasticity in variables from the healthcare system. It can be used to forecast the outcome and evaluate the implications of the implementation of any policy (Wierzbicki, 2007). This was considered highly necessary in the examination of the NHI.

Its costs and revenues are stochastic and subject to various dynamic factors such as health-seeking behaviour, benefits packages and cost-control mechanisms. Accordingly, this study applied Monte Carlo simulation. The use of this approach was also motivated by its popularity and use in wide-ranging contexts. This includes its use in the examination of combination vaccine price distributions for childhood diseases (Jacobson and Sewell, 2002), the mental healthcare technical and system efficiency (Torres-Jiménez *et al*., 2015), the cost-effectiveness of pediatric telemedicine consultations in rural emergency departments (Yang *et al*., 2015). Jones *et al*. (2016) also showed that quasi-Monte-Carlo simulations were superior in predicting healthcare costs, while Fong *et al*. (2020) demonstrated how the composite Monte-Carlo simulation would be helpful under the high uncertainty of a novel coronavirus epidemic.

i. Results of Monte Carlo simulation of cost estimates

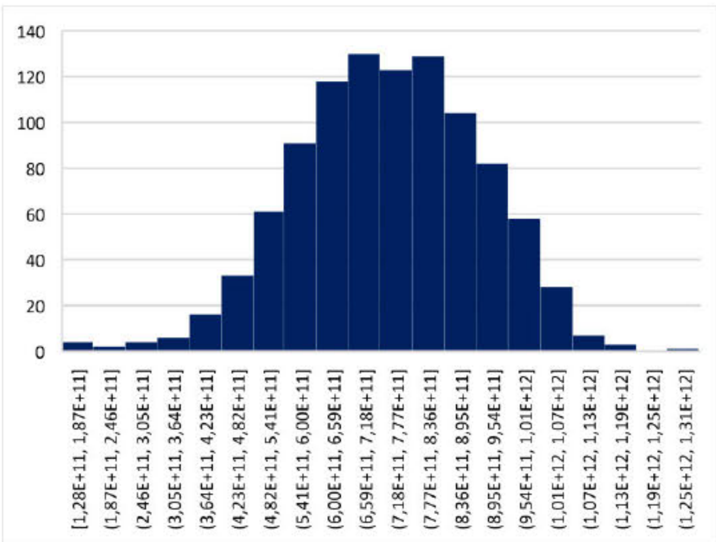
In this approach, the cost estimations from the three approaches – the historical healthcare expenditure, government employees' medical aid and low-cost medical schemes – were employed. Table 4.8 below summarises the 2020/2021 and 2026 cost estimates and their growth rates. The random triangular distribution function was employed to produce one cost figure and one growth rate figure. In probability theory and statistics, the triangular distribution is a continuous probability distribution with a lower limit a, an upper limit b and a mode c, where $a < b$ and $a \leq c \leq b$ (Heck *et al*., 2016). Accordingly, the low-cost private medical scheme estimate was designated as the lower limit. In contrast, the historical healthcare expenditure and government employees' medical scheme estimates were designated as the upper limit and mode, respectively. This was thought to be a more realistic estimation of coverage costs.

Table 4. 8 Cost estimates and growth rates based on three approaches.

The estimated cost of coverage	Historical healthcare expenditure	Government employees' medical scheme	Low-cost private medical scheme
Current (2020/2021)	R446 505 427 438	R249 310 824 820	R107 297 577 206
Projected (2025/2026)	R656 062 960 978	R574 629 482 920	R280 426 221 419
Growth rate in the cost	0.04996	0.08000	0.09500

Source: Own estimations (2021)

Figure 4.3 below is a histogram of the cost figures after 1000 simulations. The estimated values were grouped into bins that make up the histogram, and a 95 percent confidence interval was employed in line with many past studies to analyse the distribution of these cost estimations (Loving *et al.*, 2014; Kalkhoran and Glantz, 2015; Teoh *et al.*, 2020; Meybohm *et al.*, 2020). The mean cost was R721 629 253 076, with 95 percent confidence that the actual cost would be between R710 701 628 698 and R731 431 733 789. These figures are exceedingly higher than the projections made by the NDoH (2017). They also entail a significant departure from the total healthcare spending in South Africa, estimated to be about R446 505 427 438 in 2020 and an average of R326 472 773 315 in the last ten years (World Bank, 2021). This also comes even after including an exceptionally low lower limit in the simulations.



Maximum	R1 158 266 936 683
Minimum	**R220 406 268 750**
Mean	**R721 629 253 076**
Low 95% CI	**R710 701 628 698**
High 95% CI	**R731 431 733 789**

Figure 4. 3 Simulated costs of coverage
Source: Own estimations and depiction (2021)

More astounding is that the maximum was R1 158 266 936 683, highlighting the possibility of the cost of coverage exceeding R1 trillion, in line with the utterances of the former health minister. Such a high figure means that the NHI may face debilitating funding shortfalls but one to expect. As opposed to first addressing the systemic inadequacies that will most likely drive costs to these levels, the government is presenting the NHI as the answer to healthcare system challenges. Yet, those same inadequacies will drive costs (Passchier, 2017). These estimated figures may even be conservative, especially considering the level of decay in the system, the goal of providing comprehensive benefits packages at all healthcare levels and the rate with which coverage will be extended to the entire population (McIsaac, 2019). Without robust cost control measures, debilitating costs are inevitable.

ii. Results of Monte Carlo revenue estimations

As in the case of simulations of costs above, the random triangular distribution function was employed for revenue simulations. This required three base figures. Accordingly, the first approach depended on the GDP estimations, historical healthcare expenditure as a percentage of GDP, and GDP growth rate. The second approach employed tax revenue estimations, historical healthcare expenditure as a percentage of tax revenue and the growth rate in tax revenues. The third used historical budget allocations to healthcare and their respective growth rates over the past decade. Earlier in this chapter, it was argued that budget allocations are discretionary and, therefore, cannot give a reasonable basis for estimating future revenues. However, in this section, the budgetary allocation estimates were employed to get a third variable required in the random triangular distribution function in the Monte Carlo simulations.

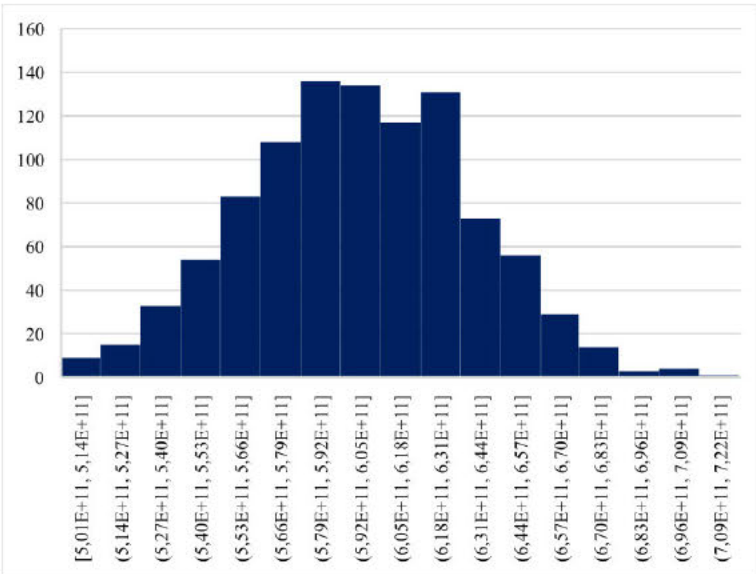
Of note, the public and private revenues were separated due to the differences in their growth rates. While the private revenue components were assumed to be the same across the three approaches, the public revenue components were assumed to differ. This is because public expenditure varies according to a country's economic performance, how much it collects as tax revenue and how much is allocated to the healthcare budget. They are also unlikely to change based on how much the country collects as tax or allocates to the healthcare budget. The total revenues from the three approaches – calculated as public expenditure plus private expenditure, adjusted to their respective growth rates – amounted to R700 268 263 558, R532 336 936 369 and R565 498 286 396, respectively, as shown in Table 4.9 below.

Table 4. 9 Revenue estimates and growth rates based on three approaches

	Based on total GDP	Based on tax revenue	Based on allocations
Total for 2020			
- Public	2.73903E+11	2.02046E+11	2.00000E+11
-Private	2.00779E+11	2.00779E+11	2.00779E+11
Average growth rate			
-Public	0.1277	0.1041	0.1277
-Private	0.0805	0.0805	0.0805
2026 estimate	700268263558	532336936369	565498286396

Source: World Bank (2022)

Figure 4.4 below is a histogram based on 1000 simulations of the expected revenues by 2026. The mean is R597 603 448 590, with a 95 percent confidence that the total revenue would be between R527 178 513 208 and R668 028 383 972. This is compared to R721 629 253 076 mean cost, with a 95 percent confidence interval that the mean would fall between R710 701 628 698 and R731 431 733 789. The lower end of the 95 percent confidence interval on costs is higher than the upper end on expected revenue. Further, the maximum revenue figure of R710 600 108 100 is much lower than the maximum cost figure of R1 158 266 936 683. On the other hand, the minimum revenue figure of R472 217 079 724 is much closer to the current total healthcare expenditure estimated to be about R446 505 427 438 in 2020. These figures suggest that the NHI is going to be unaffordable.



Maximum	710600108100
Minimum	**472217079724**
Mean	**597603448590**
Low 95% CI	**527178513208**
High 95% CI	**668028383972**

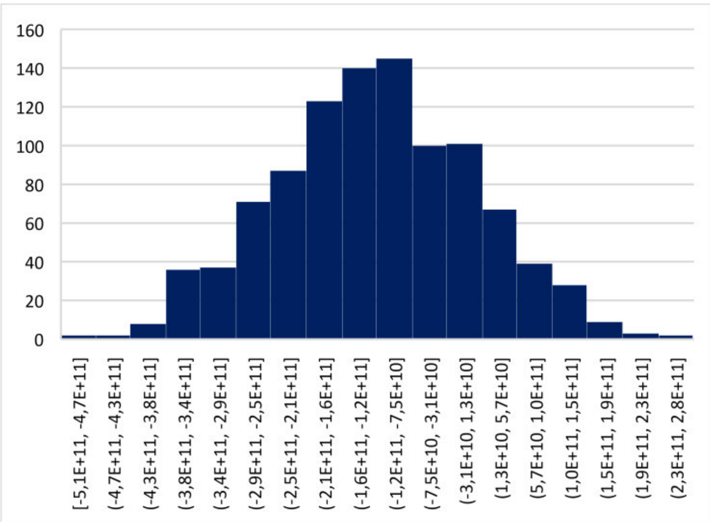
Figure 4. 4 Simulated revenues

Source: Author's own estimations (2022)

The figures align with the concerns raised against the plan to dismantle the two-tier into one fund. The level of costs expected in the provision of an expanded set of services would mean that the tax policy in South Africa would need to shift considerably (Ataguba and McIntyre, 2018). However, this would be hard to achieve, especially in an economy with a negative outlook. Further, the lack of either sufficiently broad or progressive tax instruments will keep the revenues suppressed shortly (Ataguba and McIntyre, 2018). All this contributes to the difficulty in planning for the NHI (Rolland *et al*., 2021), which might explain why the government was not specific about how the NHI would be financed. The scheme's introduction would have faced significant opposition had the government provided more detailed cost figures, which would have been much easier to dispute.

iii. Monte Carlo comparison of revenues and costs to determine affordability

Following the simulation of costs and revenues, 1000 iterations of their differences were run. The results from these simulations are in Figure 4.5 below. The average difference was found to be -R126 076 912 231, with a 95 percent confidence interval of -R141 126 691 766 to -R111 027 132 696. This means that it can be stated with 95 percent confidence that the costs would always exceed the revenues, and the actual difference between costs and revenue would fall in this interval. The minimum value is also more significant than the maximum value in absolute terms, indicating the exceedingly high shortfall the NHI may experience when fully implemented. Considering the cost and revenue estimates from sections 4.3.2.1 and 4.3.2.2, this was expected; the simulated costs were consistently higher than the revenues.



Maximum	306210837484
Minimum	**-550076551235**
Mean	**-126076912231**
Low 95% CI	**-141126691766**
High 95% CI	**-111027132696**

Figure 4. 5 Difference between Monte Carlo simulated revenues and costs

Source: Author's own estimations (2022)

A summary of the costs and revenues is in Table 4.10 below. Such huge mismatches between revenues and costs have been the source of great contention against the NHI. Although most of the opposition is coming from the private sector, in which most players would be negatively affected by the introduction of the NHI, the numbers back their concerns. The mismatch may be worsened by the lack of fiscal spending rules that ensure spending is proportional to the available resources (Omarjee, 2018). The government's goal to quickly cover the entire population and offer comprehensive benefits packages seems to go against fiscal prudence. So, even in the presence of public sector rationing methods and other cost control mechanisms, this mismatch is likely to be significant from the first year of implementation.

Table 4. 10 A summary of Monte Carlo simulated revenues, costs and growth rates

Approach	**Total GDP**	**Tax revenue**	**Budget allocation**
Revenue (2020)	4.75E+11	4.03E+11	4.01E+11
Revenue (2026)	7.00E+11	5.32E+11	5.65E+11
Revenue growth rates	0.10773	0.07838	0.08785
Approach	Historical expenditure	Government scheme	Private schemes
Costs (2020)	4.47E+11	2.49E+11	1.07E+11
Costs (2026)	6.56E+11	5.75E+11	2.80E+11
Cost growth rates	0.04996	0.08000	0.09500

Source: Author's own estimations (2022)

Further to comparing simulated costs and revenues, the Monte Carlo approach provided scope for a multi-year analysis. In this regard, the study conducted a twenty-year examination, with 2026 as the first year of implementation. The determination took the form of present value analysis wherein Revenue – Cost is the difference between revenues and costs, calculated for each of the 20 years. The present value factors were calculated based on the 30-year government bond yield, denoted as r in the equation. This rate represents the government's highest borrowing cost (StatsSA, 2018). The equation is as follows:

$$Present\ value = \frac{(Revenue - Cost)}{(1+r)^1} + \frac{(Revenue - Cost)}{(1+r)^2} + \cdots + \frac{(Revenue - Cost)}{(1+r)^{20}}$$

Figure 4.6 below shows the present values of the differences between costs and revenues each year (black line) and the cumulative amount over the period (red line). Ideally, a present positive value in each year would have been preferred as this would mean that the scheme would have generated enough funds for that year to cover the expenditure. This would mean a lower cumulative difference and a smaller distance between the two lines. However, from the figure, it is apparent that the shortfall is likely to remain negative in the next 20 years, meaning that the cumulative difference will continue to grow. This indicates the unsustainability of the NHI and a possible eventual collapse of the same if costs are not controlled or additional revenues are not sourced and brought into the fund.

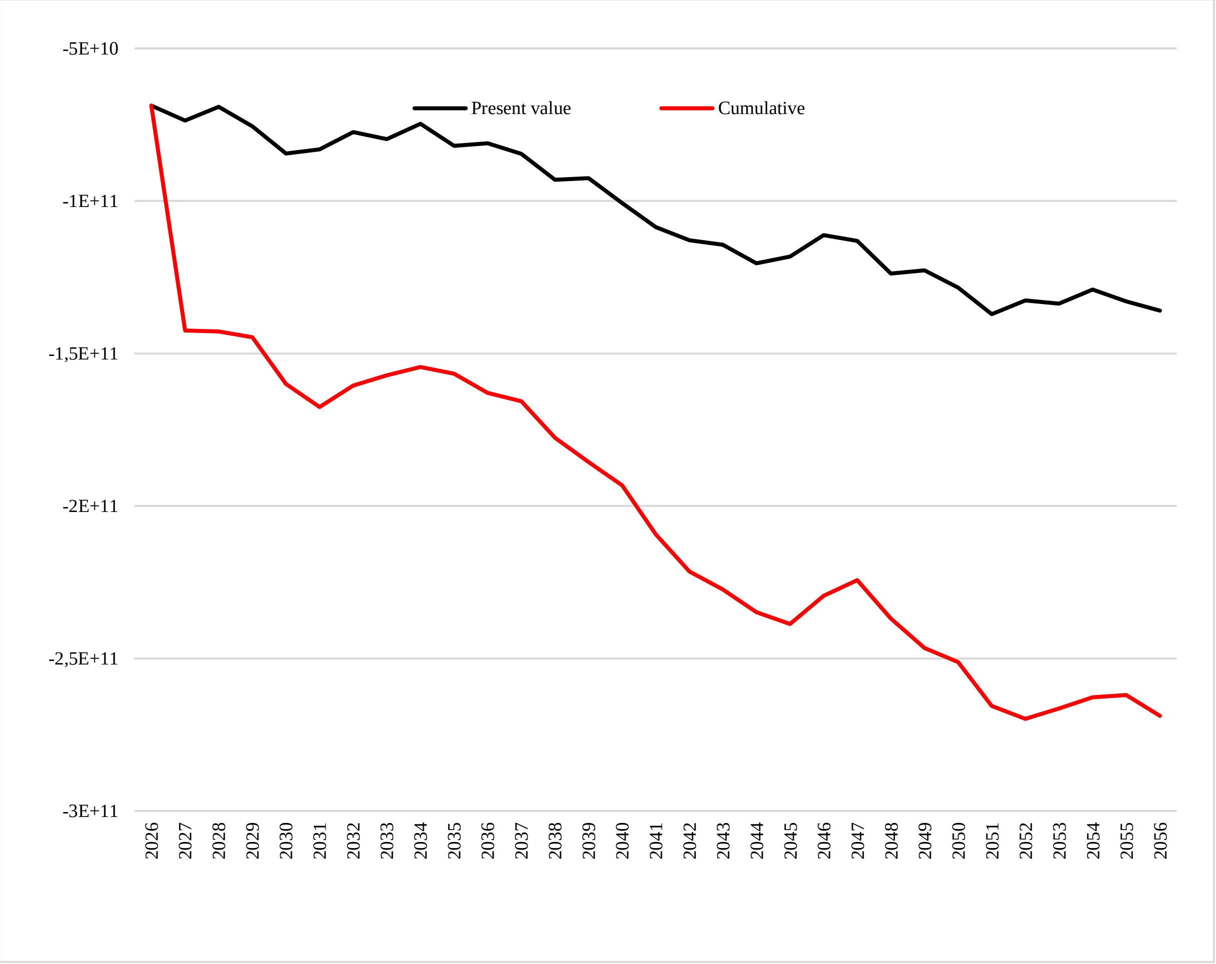


Figure 4. 6 Cumulative present value of the difference between revenues and costs

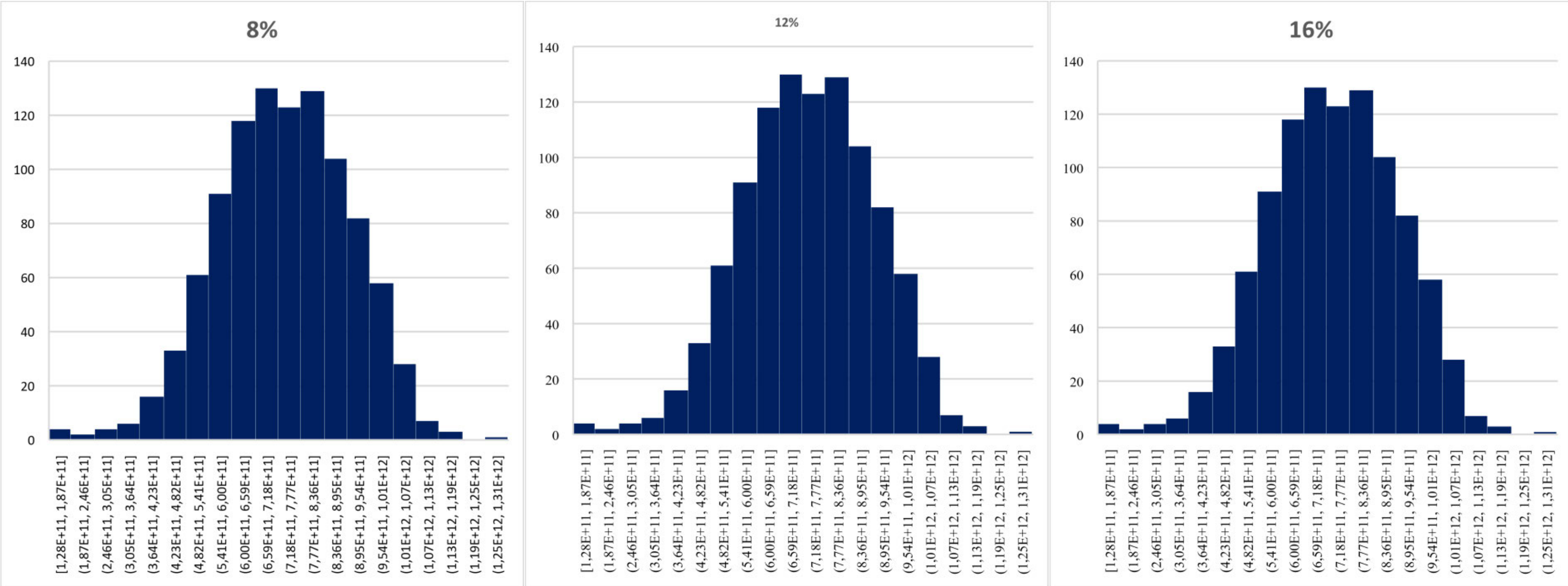
Source: Author's own estimations (2022)

4.3.3 Simulations of revenues and costs based on different growth rate scenarios

In the affordability analysis based on the comparison of projected revenues and costs, the uncertainty was not limited to estimating the base figures. Instead, it extended to the respective growth rates employed in the calculations. In this section, that possibility was entertained, and three different scenarios were considered. Based on the same random triangular distribution of the estimated costs and revenues, three growth rates – 8 percent, 12 percent and 16 percent – were individually considered. These are just arbitrary growth rates in line with the -10 percent, +10 percent and +20 percent arbitrary adjustments made to the cost figures in the comparison of revenues and costs above. Figure 4.7 and Figure 4.8 below are the histograms and accompanying descriptive statistics for the three scenarios for costs and revenues, respectively.

At an 8 percent growth rate, the average cost was R733 319 699 422, with a 95 percent confidence ranging from R727 276 376 146 to R747 769 067 268. For revenues, the average was R625 192 170 482, with a 95 percent confidence ranging from R614 945 824 921 to R635 438 516 043. The scheme would be significantly unaffordable if both costs and revenues grow at the same rate. The same applies to the 12 percent and 16 percent growth rates, where the average costs were R889 650 860 328 (R893 091 610 168 to R914 545 351 198) and R1 056 697 621 414 (R1 051 164 391 203 to R1 072 618 132 233), respectively. This is compared with average revenue figures of R761 394 965 554 (R754 224 626 482 to R768 565 304 625) and R894 387 698 921 (R885 643 157 586 to R903 132 240 256), respectively at the 12 percent and 16 percent growth rates.

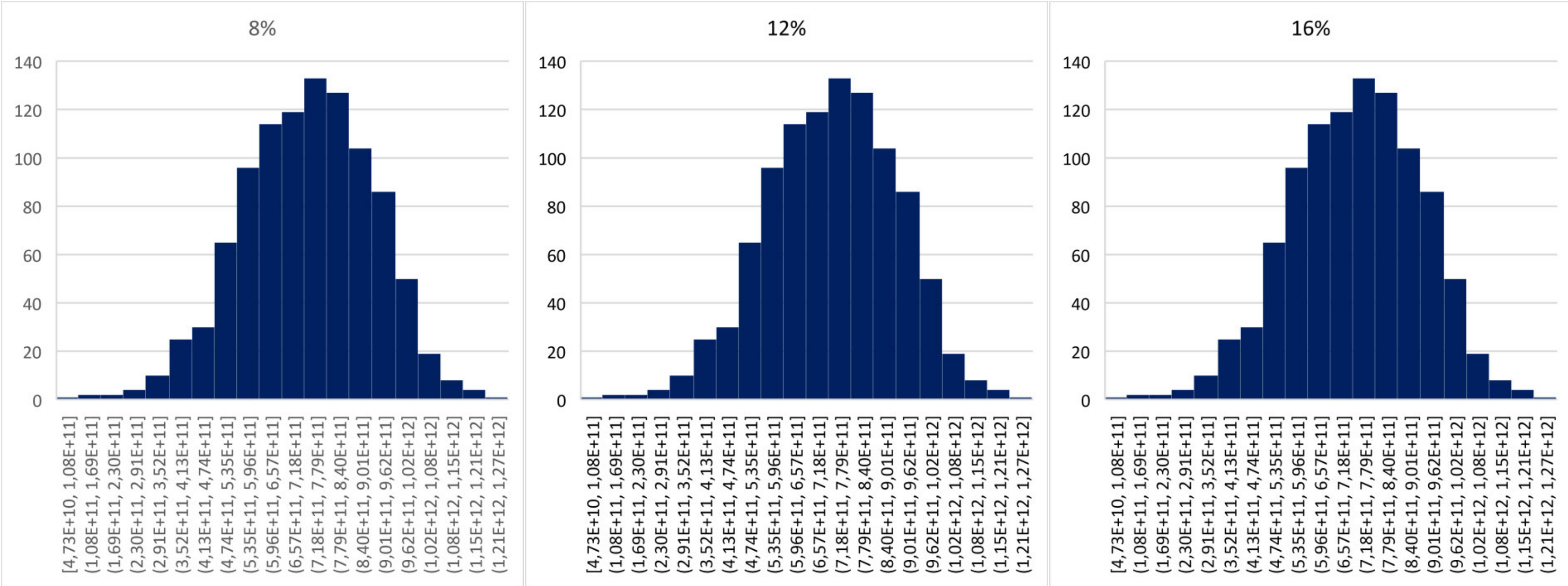
Regarding the averages, the figures suggest that revenues would have to grow at a rate of approximately 4 percent above the growth rate of costs for the NHI to be affordable at the very least. However, it is unlikely that revenue can grow faster than expenditure. The consensus is that the costs will become inhibitive and threaten the scheme. The maximum estimates at the three growth rates of R1 263 189 572 800, R1 490 039 641 563 and R1 788 387 097 263 for costs versus R1 087 501 890 224, R1 160 225 049 547 and R1 361 472 474 118 for revenues signal the potential mismatch. Further, the significant departure from the current level of expenditure because of the application of different growth rates shows that the total coverage cost is sensitive to changes in healthcare usage. While the growth in expenditure is unknown, it is still concerning that an 8 percent growth in costs would be debilitating to the NHI.



Maximum	R1 263 189 572 800	Maximum	R1 490 039 641 563	Maximum	R1 788 387 097 263
Minimum	**R222 752 227 365**	Minimum	**R315 270 958 861**	Minimum	**R277 967 068 948**
Mean	**R733 319 699 422**	Mean	**R889 650 860 328**	Mean	**R1 056 697 621 414**
Low 95% CI	**R727 276 376 146**	Low 95% CI	**R893 091 610 168**	Low 95% CI	**R1 051 164 391 203**
High 95% CI	**R747 769 067 268**	High 95% CI	**R914 545 351 198**	High 95% CI	**R1 072 618 132 233**

Figure 4. 7 Simulated costs of coverage (at 8 percent, 12 percent and 16 percent)

Source: Author's own estimations (2022)



Maximum	R1 087 501 890 224
Minimum	R48 550 989 636
Mean	R625 192 170 482
Low 95% CI	R614 945 824 921
High 95% CI	R635 438 516 043

Maximum	R1 160 225 049 547
Minimum	R405 105 813 359
Mean	R761 394 965 554
Low 95% CI	R754 224 626 482
High 95% CI	R768 565 304 625

Maximum	R1 361 472 474 118
Minimum	R366 634 055 582
Mean	R894 387 698 921
Low 95% CI	R885 643 157 586
High 95% CI	R903 132 240 256

Figure 4. 8 Simulated revenues (at 8 percent, 12 percent and 16 percent)

Source: Author's own estimations (2022)

4.4 A brief discussion and synthesis of the results from the two approaches

Table 4.11 below summarises the results from the comparative and the Monte Carlo approaches. The costs were estimated based on historical expenditure, government healthcare schemes and low-cost medical schemes and the revenues were estimated using GDP, total tax, and total budgetary allocations. The affordability determination then involved comparing the cost and revenue estimates. Of the three approaches, only the approach based on low-cost medical aid schemes indicates some likelihood of affordability. However, considering that such a cost level would mean that healthcare expenditure in the NHI will be lower than the current level, this was considered unrealistic. The more realistic estimated cost figures indicate that the scheme is likely unaffordable.

A similar pattern emerged in the Monte Carlo simulation. The average cost figure implies a significant departure from the current level of expenditure. This is concerning, considering that the healthcare system has not been able to cope with the current demand for services, particularly among the marginalized subpopulations. Further, the maximum possible cost of coverage that could be incurred based on the base costs and growth rates is significantly high, above the R1 trillion figure. This would be beyond the country's reach. Therefore, the shortfall would increase over the years, leading to sustainability problems. If poor cost controls and the effects of an inefficient system are considered – all issues likely to beset the scheme – the shortfall would be much more significant than what this model results portray. Accordingly, the scheme is likely to be unaffordable, according to the simulations.

The revenue estimations in the comparative approach indicate that the scheme would be unaffordable. The poor GDP growth rate due to the poor economic performance of the country and the lack of broad and progressive tax revenue sources that can support a new level of healthcare services may contribute to the inability to change the budgetary allocation to healthcare. This is despite the new taxes that may be introduced to fund the NHI. The simulated average revenue figures also show a modest increase in the revenue that could be raised for healthcare. Considering that this revenue growth may be constrained by poor economic performance and the country's tax structure, their sufficiency to cover the level of expenditure expected is highly unlikely. Overall, both approaches show that the scheme is unaffordable and unsustainable based on the level of expenditure expected.

Table 4. 11 A summary of Monte Carlo simulated revenues, costs and growth rates

<table>
<tr><th rowspan="2">Approach</th><th colspan="3">Cost estimation</th><th colspan="3">Revenue estimation</th><th rowspan="2">Revenue versus costs</th></tr>
<tr><th>Historical expenditure</th><th>Government health scheme</th><th>Low-cost medical schemes</th><th>Gross domestic product</th><th>Total tax revenues collected</th><th>Total budgetary allocation</th></tr>
<tr><td rowspan="2">The comparative approach</td><td>Expenditure is likely to change due to poor cost controls and a lack of fiscal rules on expenditure</td><td>The government scheme shows signs of unaffordability based on poor coverage of low-income groups</td><td>If the scheme cost structure is similar to low-cost schemes, it might be possible to afford the scheme</td><td>The poor growth rate in GDP due to the poor economic performance of the country</td><td>Lack of broad and progressive tax revenue sources that can support a new level of healthcare services</td><td>The change in the budgetary allocation, though supported by new taxes, may be too steep</td><td>The scheme is likely to be unaffordable</td></tr>
<tr><td>Unaffordable</td><td>Unaffordable</td><td>Affordable</td><td>Unaffordable</td><td>Unaffordable</td><td>Unaffordable</td><td>Unaffordable</td></tr>
<tr><td rowspan="2">Monte Carlo simulation approach</td><td colspan="3">The simulated figure – the average - shows a significant departure from the current level of healthcare spending

The maximum possible cost that could be incurred is significantly high, above the R1 trillion figure

Poor cost controls and an inefficient system could add to the cost.</td><td colspan="3">The simulated average revenue figure shows a moderate increase in the revenue that could be raised for healthcare relative to current figures

Revenues growth will be constrained by poor economic performance and the tax structure of the country</td><td>There is a vast gap between the simulated costs and revenues</td></tr>
<tr><td colspan="3">Unaffordable</td><td colspan="3">Unaffordable</td><td>Unaffordable</td></tr>
</table>

Source: Author's own compilation (2022)

4.5 Chapter summary and conclusions on the affordability of the scheme

One of the most noted concerns regarding the NHI is its affordability. Stakeholders have voiced their concern about the scheme's ability to secure enough funds to cover the anticipated growth in expenditure once it is rolled out nationally. In this chapter, an assessment of whether the scheme is affordable was conducted. The sufficiency of funding to cover expenditures is at the core of any decisions concerning its design and implementation. Failure to secure enough funds or control costs may lead to sustainability problems and, in the worst-case scenario, a complete scheme collapse. However, as alluded to above, the South African healthcare system cannot afford any failure of the scheme because that could leave it in a worse state than it already is. This section reviews the objectives of this chapter and the findings from the estimations and analyses conducted herein.

4.5.1 Review of objectives

The NHI has been lauded as the answer to the many inadequacies plaguing the South African healthcare system and impeding the country from attaining universal health coverage. However, while the scheme's introduction is welcome, many questions regarding its affordability and sustainability remain unanswered. The growing sentiment is that the cost of the scheme is prohibitively high. There is also a growing realisation that the current economic outlook will constrain the government's ability to raise funds needed to finance the scheme sustainably. This study conducted a pre-implementation evaluation of the NHI, where its projected costs and revenues were compared under certain assumptions. This evaluation relied on the evidence from the literature about the key drivers of costs, critical sources of revenues, and other parameters that affect NHIs' affordability.

4.5.2 Review of findings

From examining the estimated costs using three approaches – based on historical healthcare expenditure, the government's employees' medical scheme and low-cost medical aid schemes – the results suggested that the scheme will cause a significant shift in total expenditure and, therefore, may be unaffordable. The revenues estimated based on GDP, tax revenue and budgetary allocation estimates, and respective growth rate estimates further reinforced the assertion that the scheme is unaffordable. A Monte Carlo simulation analysis of the costs and revenues was also conducted. The simulation also showed that implementing the scheme would result in a considerable jump in expenditure from the current expenditure. However, the change will not likely be matched by the increase in revenues, even if new taxes were introduced.

A comparison of the costs and projected tax revenues also highlighted how expensive the scheme would be if implemented as currently conceived. The total cost will likely be beyond what South Africa can reasonably fund. The current economic outlook and fiscal condition of South Africa show that the government should expect a limit on the resources it can gather to fund the scheme shortly. This worsens the unaffordability of the scheme. As per the Monte Carlo simulations of revenues and costs in different scenarios, revenues would have to grow more than 4 percent above the cost growth rate for the scheme to be affordable. However, this is unlikely based on the historical trends in healthcare expenditures and the demand shock expected following the scheme's implementation.

4.5.3 Conclusion

There are significant policy considerations from these findings. The concerns voiced by many stakeholders concerning the NHI are much more understandable, especially with the realisation that the scheme may be significantly unaffordable. The government plans to go ahead with its implementation even though introducing an unaffordable scheme may worsen many of the inadequacies in South African healthcare. One of the scheme's goals is to improve equity – accessibility, attainability and affordability of healthcare services – in the healthcare system. However, implementing an inadequately financed scheme could entrench inequity in the system. To avoid a collapse of the healthcare system, the government should consider scaling down the scheme's reforms to a sustainable level.

It might be better to focus more on primary healthcare reforms that may bring more significant positive change to the healthcare system if well executed. Alternatively, the government can offer benefits packages that are less comprehensive or extend coverage to different population groups over a more protracted period than planned. This would allow the scheme to adjust without pressure on resources and be progressively adapted to changing population needs and any improvement in the NHI's capacity. A fiscal rule that limits expenditure to the available resources and a global budget may ensure that the NHI does not operate on an unsustainable and growing deficit. Co-payments can also be used to ration healthcare services to improve the scheme's sustainability further.

CHAPTER 5: STAKEHOLDER SENTIMENTS TOWARDS THE NATIONAL HEALTH INSURANCE SCHEME

5.1 Introduction to stakeholder sentiments toward the NHI

The previous chapters examined the systemic threats to the NHI and its affordability, considered the most critical aspects of its success. There are also some high-ranking factors regarding sentiment formation amongst healthcare stakeholders. This chapter focuses on stakeholder sentiments as one of the key success factors of the impending NHI. There are concerns that the scheme will not garner the necessary support from these stakeholders, hence the need to examine the risk each stakeholder type would pose if they do not support the scheme and why they would not support it. Expectedly, this chapter is an extension of the previous three chapters by design because analysing stakeholders' sentiments availed some information on the systematic threats and affordability issues dealt with therein.

This chapter is organized as follows: Section 5.1 provides the chapter's background and the problem statement. Section 5.2 describes the theoretical framework used to analyse the sentiments. This section also contains a review that focuses on the sentiments of three main stakeholder groups – taxpayers who fund these schemes, beneficiaries of NHIs' benefits packages and healthcare providers – from an international and South African perspective. Section 5.3 describes the methodological approach employed in the study – the sampling and collection of news articles and textual sentiment analysis procedure. Section 5.4 presents the results from the aggregate and constituent sentiment analysis and a thematic discussion of issues identified in the text. Section 5.5 concludes the chapter.

5.1.1 Background to stakeholders' sentiments towards the NHI

When implementing a reform package as momentous as the impending NHI, it is vital to gauge the stakeholders' sentiments towards those reforms as they can predict failure or success (Schmeer, 2000). How stakeholders perceive any form of reform or policy – its rationale or its operational aspects – determines their support for the same, particularly those fundamentally relationship-dependent. As mentioned above, Anderson *et al*. (2005) described the healthcare system as complex and adaptive, wherein the actor relationships are critical but generally nonlinear and have significantly unpredictable dynamics. Thus, the success of most healthcare reforms and policies is fundamentally linked to the sentiments of these different actors, which are likely to be complex and adaptive. This heightens the necessity for determining the actors' sentiments when implementing policies or reforms.

When reform failure can be disastrous, understanding stakeholder sentiments becomes more imperative (Yusuf *et al*., 2019). This is the case regarding the NHI in South Africa, especially considering how unionised the healthcare industry is (Dhai and Mahomed, 2018; Robinson and Variava, 2018). Without buy-in from the crucial stakeholders, instituting reforms in the South African healthcare system may be difficult. In the worst-case scenario, reforms may fail, leaving the country with a worse healthcare system than it currently has (Maphumulo and Bhengu, 2019). Further, due to the size of the scheme, copious amounts of scarce resources would have been wasted if it failed. This highlights the importance of understanding stakeholder sentiment towards the scheme and its drivers, as it may help ensure that there is enough buy-in for the success of the NHI by addressing some concerns that may be identified.

The importance of stakeholders' sentiments could explain the surge in the number of studies examining this aspect in various countries. They primarily focus on three main stakeholder groups. The first group is the general public as the taxpayers (Adams et el., 2015; Basaza *et al*., 2017; Al-Hanawi *et al*., 2018; Noor *et al*., 2019; Tewele *et al*., 2020; Akwaowo *et al*., 2021). The second group is the general public in its capacity as beneficiaries of the respective schemes (Chomi *et al*., 2015; Amo-Adjei *et al*., 2016; Mohammed *et al*., 2016; Duku *et al*., 2018; Yeshiwas *et al*., 2018; Thapa *et al*., 2019; Michael *et al*., 2020; Ellis *et al*., 2021). The third group comprises the providers contracted under these schemes (Christina *et al*., 2014; Alhassan *et al*., 2016; Oladimeji *et al*., 2017; Sieverding *et al*., 2018; Owili *et al*., 2019). All these studies highlight the need for stakeholder buy-in, even for meticulously designed reforms.

Various financial reform-related factors have been noted as influential to stakeholders' sentiments. Taxpayers' sentiments may be influenced by their socioeconomic status, trust in the government and the success of previous government-run policies (Al-Hanawi *et al*., 2018; Noor *et al*., 2019; Tewele *et al*., 2020; Akwaowo *et al*., 2021). Conversely, beneficiaries' sentiments can be shaped by the quality of healthcare received, perceived benefits in the scheme, treatment by healthcare providers and the knowledge of the scheme's operations (Yeshiwas *et al*., 2018; Nsiah-Boateng *et al*., 2019; Kofoworola *et al*., 2020; Adewole *et al*., 2021). Lastly, for providers, factors such as funding adequacy, accreditation processes, claims reimbursement, and reference pricing can also shape their perceptions (Awoonor-Williams *et al*., 2016; Oladimeji *et al*., 2017; Sieverding *et al*., 2018; Owili *et al*., 2019).

Of note, some factors shaping stakeholders' sentiments internationally seem to match those influencing sentiments towards the still impending NHI. These include perceived systemic inadequacies and demographics such as race and socioeconomic status for taxpayers (Shisana *et al*., 2006; Harris *et al*., 2011; Goudge *et al*., 2012). For beneficiaries, factors such as the status of the current system, experiences with the system, the level of trust in the government and awareness of the operational aspects of the scheme were found to be significant drivers (Weimann and Stuttaford, 2014; Setswe *et al*., 2016; Douwes *et al*., 2018; Tandwa *et al*., 2020). Finally, for providers, the most noted factors were awareness of the scheme, sustainability of reimbursement, government's financial and administrative capacity (Molokomme *et al*., 2018; Gaqavu and Mash, 2019; Matthew and Mash, 2019; Murphy and Moosa, 2021).

When sentiments are significantly negative, a complete overhaul of proposed reforms may be necessary (He and Ma, 2021). However, prevailing stakeholders' sentiments can indicate the government's effectiveness in policy communication. Thus, it could take something as simple as an improvement in policy and proposed reform communication. Stakeholders normally reject or oppose reforms they do not understand but embrace those well communicated to them. This assertion is consistent with findings in some South African studies on the NHI, where poor communication on the part of the government regarding some aspects of the scheme has resulted in negative views (Grewar, 2017; Booysen, 2017; Molokomme *et al*., 2018; Gaqavu and Mash, 2019). It is also consistent with some findings from international studies (Okaro *et al*., 2010; Mulupi *et al*., 2013; Tewele *et al*., 2020).

In this chapter, a pre-implementation assessment is conducted to determine the sentiments of taxpayers, providers and beneficiaries and their drivers towards the South African NHI. The aim was to determine whether stakeholder sentiments threatened the successful implementation of the NHI. It was based on the concern that stakeholder sentiment could be negative enough to threaten the scheme's viability even if its fundamentals are in place. Thus, as an ex-ante evaluation, the results could help the government gauge the support it should expect from these stakeholders and the drivers behind their perceptions. In the case of significantly negative perceptions, a recommendation of how that could be remedied was forwarded. On the other hand, if the perceptions were positive, the government would know what it is doing right and how it can be improved further.

For several reasons, examining stakeholder perceptions in the South African context was considered particularly important in implementing the NHI successfully. For one, the scheme will have to consume enormous amounts of resources to bring about adequate reform to the system that has been promised while, at the same time, the country seems to be running out of financial resources owing to a dwindling tax base (Pillay-van Wyk *et al*., 2016; Omarjee, 2018). Secondly, the scheme will contract with private providers because the currently ill-equipped public sector cannot handle service demand increases (Moosa *et al*., 2016; Smith *et al*., 2018). Thirdly, the health-seeking behaviour of the prospective currently marginalised beneficiaries is expected to change significantly (Smith *et al*., 2018; Govender *et al*., 2021). Thus, analysing the sentiments of these groups is vital to gauge the support for the NHI.

5.1.2 Statement of problem on stakeholders' sentiments examinations

The sheer number of studies investigating stakeholder sentiments towards the NHI highlights the importance of support as a success factor for the scheme. However, most studies narrowly focused on a single group of stakeholders at a point in time rather than various groups of stakeholders over time (Matsi, 2015; Surender *et al*., 2015; Mathe, 2015; Setswe *et al*., 2016; Passchier, 2017; Aluko, 2018; Gaqavu and Mash, 2019; Matthew and Mash, 2019; Tandwa *et al*., 2020; Murphy and Moosa, 2021). Yet, sentiments are dynamic and vary significantly across groups. Further, sentiments towards the rationale of the scheme and its operational aspects could also vary. Failure to realise this possible distinction might invalidate the warranted remedial action. Therefore, it was vital to examine sentiments across different stakeholders and towards different aspects of the scheme over time.

5.1.3 Chapter's aim and objectives on stakeholders' sentiments examination

As indicated in section 1.3 of Chapter 1, the aim herein was to determine the stakeholders' sentiments towards the NHI and the extent to which they threaten its successful implementation. This aim was achieved by fulfilling the following objectives:

- determine what the stakeholders' sentiments towards the rationale and the operational aspects of the South African NHI are;
- determine the extent to which the stakeholders' sentiments are a threat towards the South African NHI;
- determine the extent to which the handling of covid-19 impacted stakeholder sentiments towards the South African NHI.

To achieve these objectives, news articles were employed to include more than one stakeholder group and facilitate the examination of sentiment over time. The Stanford CoreNLP, a Java-based annotation pipeline framework for natural language processing, was used. A distinction between sentiment towards the scheme's rationale and its operational aspects was made.

5.2. Literature review of stakeholders' sentiment and NHIs

Stakeholder sentiments can be a significant determinant of the success or failure of any proposed reforms. Thus, it is unsurprising that many studies seek to analyse them and determine their drivers. This section describes stakeholder sentiment and the theoretical framework employed in this chapter. This is followed by a review of international studies exploring stakeholder sentiments towards their respective NHIs.

5.2.1 Stakeholder sentiment as a concept in healthcare

In any healthcare system, there are three main stakeholder groups that policymakers have to consider. Firstly, some citizens employ the services from the providers and are beneficiary customers of the payers. This is the group to whom the policymakers have a fiduciary duty and for whom the country's healthcare policy is established to benefit (Rowe and Moodley, 2013; Rushton, 2016). Secondly, some providers operationalize healthcare delivery within the policy framework. They provide services, maintain information and coordinate patient care (Thorpe *et al*., 2016; Ahluwalia *et al*., 2017). Finally, the payers operationalize the financial elements of the policy framework. They enrol beneficiaries and procure services on their behalf. They are also responsible for the actuarial task of ensuring the financial sustainability of healthcare programs (Cleverley and Cleverley, 2017).

In Figure 5.1 below, the four main stakeholders, policymakers included, are illustrated. For policymakers, the sustainability of the healthcare institutional model is of top priority. This is established through good governance, robust accreditation processes, professional bodies, and quality assurance activities in the system. For patients, the concern is regarding the appropriateness of the healthcare services provided in terms of speed and quality, cost and scope, time and accuracy. For providers, which include hospitals and clinics, physicians, laboratories and social care, the concern is mainly on the choice of treatment with the best outcome. Finally, for the payers – comprising the general public, insurance companies, the healthcare industry as a whole and the patient, the concern is mainly on the value derived from the services provided (Mrak and Sokolic, 2019)

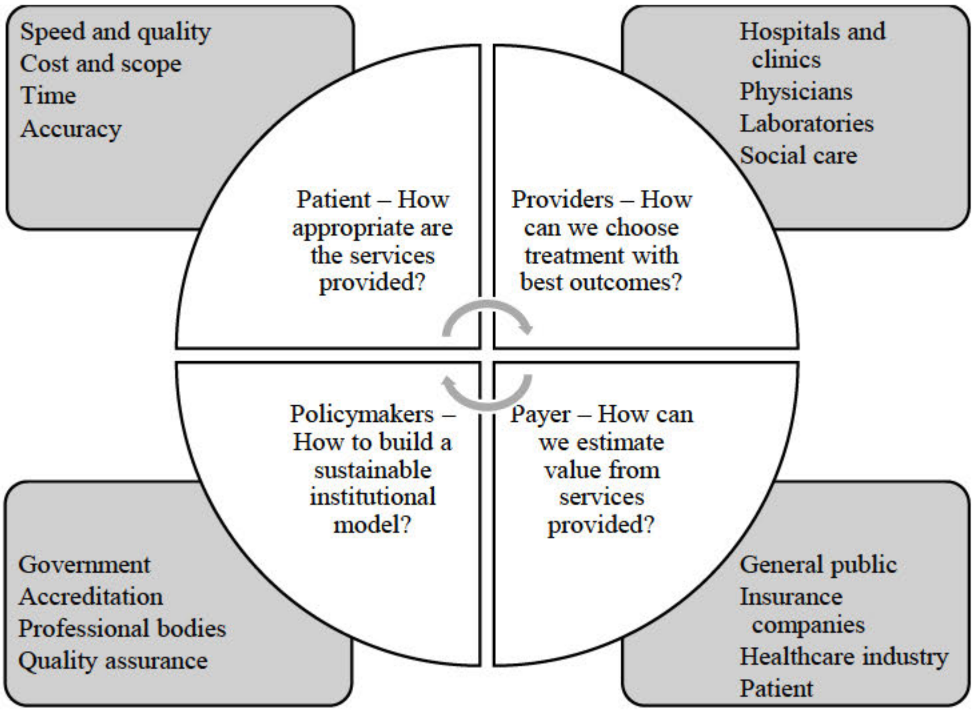


Figure 5. 1 Stakeholders in the healthcare system

Source: Mrak and Sokolic (2019)

Understanding stakeholders' incentives is essential for program success and sustainability (Dansky and Gamm, 2004). This is especially true in healthcare programs that consume significant resources over protracted periods. As such, stakeholder management is vital when establishing the framework within which healthcare is provided in the country. Policymakers, therefore, use population-level metrics from patients, providers, and payors to inform their healthcare policies (Thorpe *et al*., 2016). The course of any such healthcare policies, programs and reforms is mainly dependent on the strengths and interests of different stakeholders in the healthcare system and their roles during the implementation phase. Any imbalances among stakeholders in the health system can cause several aspects of the reform to stray from the original plan (Horey and Babad, 2005).

With continuous change in healthcare, it is critical to have a proper stakeholder engagement strategy in place. The government must first understand the needs of stakeholders before developing a stakeholder engagement plan (Swinkels *et al*., 2018). Such a method offers a comprehensive picture of the numerous stakeholders impacted by a project, assisting in the production of tailored engagement for each stakeholder group and the project's execution (Lee and Kwak, 2012). However, the multiplicity of stakeholders in healthcare might make it challenging to achieve essential interactions, and the failure to interact with one or more stakeholder groups may jeopardize the success of any project, such as NHIs (Balabanova *et al*., 2010). This is because the healthcare sector is highly impacted by its stakeholders, and the interrelationship among them can be overly complex.

If the government successfully engages key stakeholders, their sentiments may be strategically analyzed to develop more acceptable policies and implement initiatives that will be supported (Franco-Trigo *et al*., 2017). These sentiments indicate whether a particular group of stakeholders will support any proposed project, the shape of the project they would accept, the problems that are important to them, the potential risks, and any opportunity to establish excellent relations (Mitton *et al*., 2009; Chafe *et al*., 2011; Meetoo, 2013). Any such analysis should include a determination of stakeholders' decision power and interest in the project, their potential effect on the proposed project and any expectations the implementing authority may have of them. The chance of failure may be reduced if the government has fostered effective monitoring of stakeholders' engagement activities and feedback mechanisms.

5.2.2 Theoretical framework for examining stakeholder sentiments

Theoretical frameworks provide a connection between studies and existing literature. They also form the basis for hypotheses and research approaches. In this regard, the advocacy coalition framework was used to examine stakeholder sentiment. Introduced by Sabatier (1988) and furthered by Sabatier and Jenkins-Smith (1991), this theory of change specifies that in public policy, there are coalitions that form due to particular interests. The framework was designed for policy areas characterised by high goal conflict, high technical uncertainty, and many stakeholders from multiple government levels (Hoppe and Peterse, 1993). This fits the policy issues relating to the NHI very well, especially when a layer of private healthcare actors and some special interest groups are considered, hence its use in this chapter

As depicted below in Figure 5.2, the model comprises several interdependent parts. The relatively stable system parameters influence the external system events, which impact subsystem actors' constraints and resources (Weible and Ingold, 2018). The policy subsystem comprises advocacy coalitions with their own beliefs and resources. It is also made up of policy brokers concerned with keeping the level of political conflict within acceptable limits (Sabatier and Weible, 2019). The decisions made by policymakers determine the success of governmental programmes and thus affect policy outputs. Feedback effects are strongly present in the policy subsystem (Weible and Ingold, 2018). Therein, individuals such as financers and taxpayers, beneficiaries and healthcare providers in their collective interactions as stakeholders of the NHI and the government are at play.

Based on the actor-centred approach in this framework – a healthcare stakeholder-centred approach in the case of the NHI – the effectiveness of coalitions in policy formulation and implementation was examined (Weible and Ingold, 2018). It was assumed that the NHI policy development occurs within policy subsystems. Thus, understanding the political dynamics of policy subsystems is essential to explaining policy change in the healthcare system (Schmid *et al*., 2020). Within these subsystems are the various actors from the public and private healthcare sectors and organizations actively involved in seeking solutions to a policy problem. The South African healthcare system's goal is UHC (Michel *et al*., 2020; Wagstaff and Neelsen, 2020). Actors from both sectors are well acquainted with this issue as they have been actively participating or seeking to participate in policy formulations in this domain.

Further, in the advocacy coalition framework, policy subsystem actors are driven by their beliefs and their desire to see them reflected in policy (Ingold *et al*., 2017). These could be deep core beliefs, policy core beliefs or secondary beliefs (Pierce *et al*., 2017; Okeke *et al*., 2021). This is applicable in the South African healthcare subsystems as well. From the government's perspective, healthcare in South Africa should reflect the principles of universal health coverage, such as equity in financing, a founding principle of the NHI (NDoH, 2017). On the other hand, while they recognise the need for financing reform, private sector interest groups believe that the private sector should be protected and be left to operate with less interference from the government (Rispel, 2016; Matthew and Mash, 2019; Michel *et al*., 2020). This may explain their antagonism to the NHI as it may change their way of operating.

According to Sabatier and Weible (2019), the subsystem is also subject to external factors, such as a relatively stable parameter or an external shock. In the case of the South African healthcare system, the stable parameter is poor health outcomes. This is a vital catalyst for significant policy change as it provides a stimulus to change that is totally outside the subsystem's control. Those external events are essential because they shock the policy subsystem and shift public attention towards the subsystem (Ingold *et al*., 2017; Sabatier and Weible, 2019). As South Africa prepares to introduce the NHI, attention has significantly shifted to how the scheme will shape up. Finally, the institutional context influences the formation of coalitions, the stability and maintenance of the coalition, and the strategies used and resources available to them (Weible and Ingold, 2018).

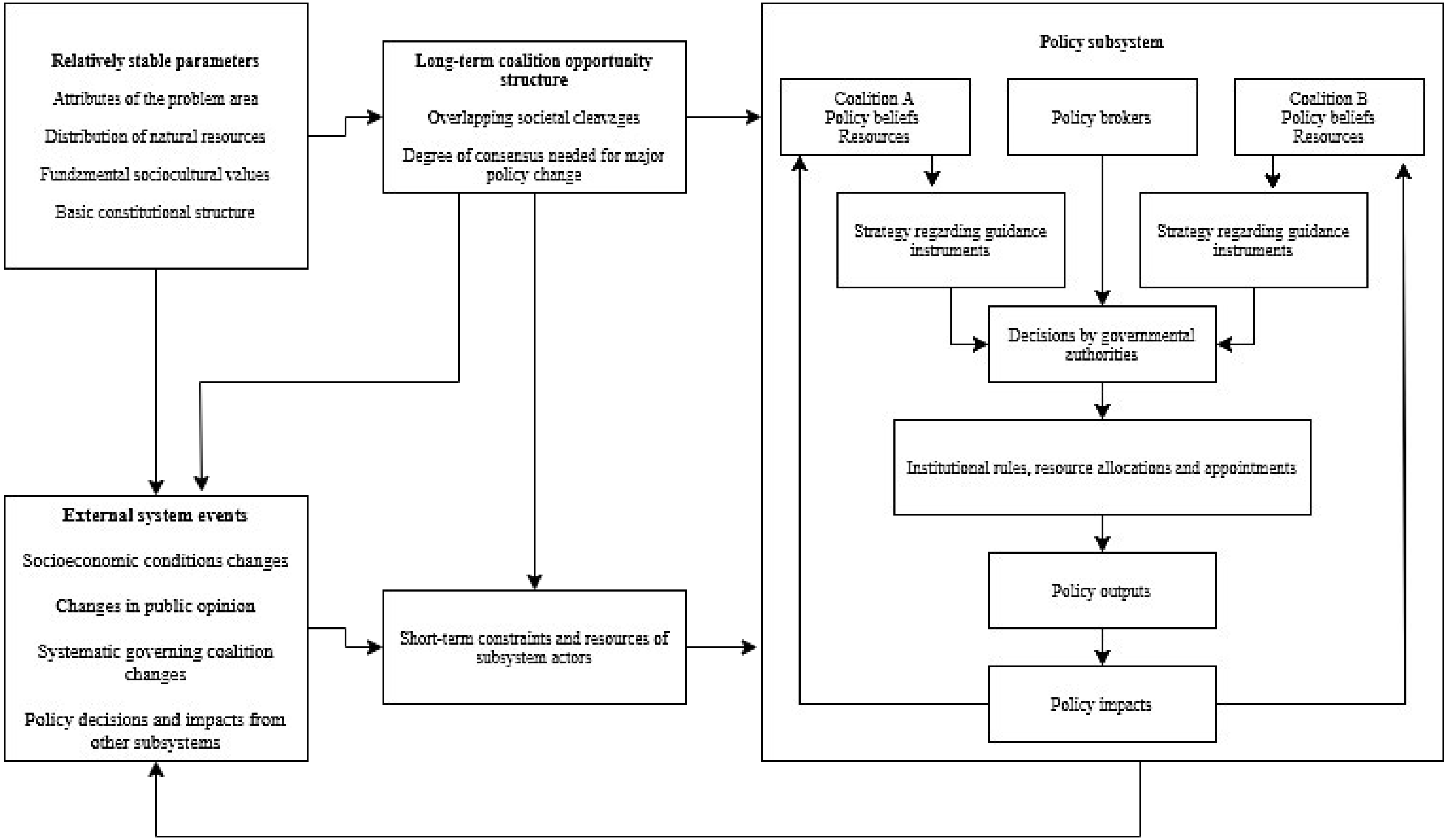


Figure 5. 2 The advocacy coalition framework

Source: Adapted from Chikowore (2018)

5.2.2 Literature on stakeholders' sentiments towards NHIs

As alluded to above, the sentiment of healthcare stakeholders may significantly influence the performance and sustainability of any NHI as they determine the willingness of taxpayers to pay, the willingness of beneficiaries to enrol and the willingness of providers to participate. This section reviews the studies that have explored various healthcare stakeholders' sentiments, attitudes and perceptions regarding NHIs.

i. *Taxpayers' sentiments, attitudes and perceptions on health insurance*

Several international studies have explored the public's sentiments in their capacity as funders of NHIs. In one such study, Perneger and Hudelson (2005) examined the factors associated with the public's preference for financing healthcare according to their ability to pay in Switzerland. Their findings revealed public support for reform to strengthen solidarity between the sick and the healthy. A past preference for a social health insurance system in the local community best explained the support for a more social financing structure. This finding suggests that social solidarity achieved through cross-subsidization can be used as part of the rationale for introducing such a scheme. This would create more buy-in from taxpayers and improve the chance of success for that scheme. Also, where there is a history of success in social health insurance, support for subsequent schemes is easy to garner.

Lang and Lai (2008) investigated Taiwanese citizens' willingness to pay for the NHI and extend it to cover long-term care services. The respondents were willing to pay more for their insurance coverage due to their experience with the scheme. This finding implies that how an NHI performs influences future willingness to pay. Therefore, governments can create cumulative buy-in for their schemes through good administration and performance. Another study in the Nigerian context by Olugbenga-Bello and Adebimpe (2010) investigated a similar issue of the willingness to pay for the NHI but with a focus on Nigerian civil servants. They found that it was influenced by their awareness of methods of options of healthcare financing and the scheme itself. Their findings point to the importance of the design of the different aspects of an NHI, particularly the financing options available.

Still in Nigeria, Onwujekwe *et al*. (2010) examined Nigerian individuals' willingness to pay for community-based health insurance. Only a minority were willing to pay for insurance, especially in rural communities, depending on socioeconomic status. This finding implies a need for variability in the financing mechanisms depending on location and socioeconomic status, as these are determinant factors of the ability to pay. Similarly, Mershed *et al*. (2012) examined the willingness to participate in an NHI in Syria. They found a need for reform and a willingness to support NHI, provided contributions are based on the ability to pay. So, consideration of factors influencing the ability to pay is paramount. They also noted issues related to the scheme's performance, such as waiting times, corruption and inefficiencies, as determinant factors of the willingness to pay, in line with Lang and Lai (2008).

In another international study, Almualm *et al*. (2013) examined the support for the proposed NHI among Malaysian patients attending specialist clinics and its influencing factors. A majority of the respondents were willing to pay for the scheme, some being of the view that it should be compulsory, and knowledge positively influenced their support for NHI. These findings highlight how knowledge about NHI aspects can create the requisite support for its success. Adams et el. (2015) also examined the public's willingness to pay for NHI in St. Vincent and the Grenadines. The respondents were willing to pay and enrol in the scheme, but willingness was subject to socioeconomic status. This finding points to the need for governments to engage people with a lower socioeconomic status to enhance their understanding of and participation in the plan.

Also assessing the willingness to pay, Basaza *et al*. (2017) found that public servants in Sudan were willing to pay for the scheme, subject to individual income, awareness, alternative sources of income, household size, insurance coverage and religion. This finding, in line with Onwujekwe *et al*. (2010), highlights the need for context-specific NHI financing mechanisms instead of the unvaried structures that generally characterise these schemes. Similarly, the need for context-specific financing mechanisms was also highlighted by Al-Hanawi *et al*. (2018). The authors examined the feasibility of healthcare financing reform and the willingness to pay for a contributory NHI in Saudi Arabia**.** Over two-thirds of the respondents indicated their willingness to participate in the NHI, but subject to demographical characteristics.

In another study by Al-Hanawi *et al*. (2018), most Saudi respondents indicated a willingness to pay for insurance, conditional upon improvements in the quality of public sector healthcare services and a partnership between the public and private sectors. So, this finding points to the private sector's importance in influencing the acceptance and willingness to pay for insurance. However, this contradicts the findings by Noor *et al*. (2019), who showed a high willingness to pay for a scheme among Malaysian households, with most respondents believing that a government body should wholly run the scheme. The difference in results regarding the government and the private sector's function in NHI operations may point to the impact of trust in the government as a determinant factor of the willingness to pay and participate in an NHI.

In the same vein as past studies, Tewele *et al*. (2020) examined the willingness to pay for health insurance among public health professionals in Ethiopia. They reported that income, awareness, history of unaffordability and perceived quality of healthcare services influenced the willingness to pay. Akwaowo et al. (2021) consistently reported that rural Nigerian residents' willingness to pay for health insurance was subject to income levels and perceived benefits from the scheme. Similar findings were also reported in Ethiopia (Minyihun *et al*., 2019; Kado *et al*., 2020) and Cameroon (Cheno *et al*., 2021). In another study, Batbold and Pu (2021) examined the feasibility of a health insurance scheme for the Mongolian working population. A majority exhibited a high willingness to pay due to dissatisfaction with the current healthcare system.

The studies reviewed above point to the subjectivity of the willingness to pay for health insurance to many factors. These include experience with the scheme and perceived benefits (Lang and Lai, 2008; Al-Hanawi *et al*., 2018; Tewele *et al*., 2020; Akwaowo *et al*., 2021). Other demographics such as the socioeconomic status, ability to pay, residential location and household size were also found to be significant contributors (Onwujekwe *et al*., 2010; Mershed *et al*., 2012; Adams et el., 2015; Basaza *et al*., 2017; Al-Hanawi *et al*., 2018). These findings highlight that the willingness to pay is context-specific, which should be considered when designing NHIs. The government should also aim to engage the public to create more support for national or social health insurance schemes based on those factors.

ii. Beneficiaries' sentiments, attitudes and perceptions on NHIs

Other studies examined beneficiaries' sentiments, as in the case of the studies on the funders of NHIs. It should be noted that most of the studies are from Ghana and Nigeria. Among the studies conducted in Ghana, Jehu-Appiah *et al*. (2012) assessed the perceptions of insured and uninsured households on health insurance schemes. The study found perceptions related to the healthcare providers in the schemes, the schemes and community attributes play an essential role, albeit to a varying extent, in household insurance enrolment decisions. This implies that policymakers need to recognize household perceptions as potential barriers or enablers to the enrolment and sustainability of insurance schemes in different settings. Subsequently, this recognition of the impact of perceptions would enable the policymakers to invest in understanding them in their design of interventions to stimulate enrolment.

Dalinjong and Laar (2012) found that the negative perceptions of insured patients were determined by the perceived discrimination they faced from healthcare providers due to delays in their reimbursements. On the other hand, the affluent and uninsured who made immediate payments received better care. The differences in insurance status are, therefore, a differentiating factor in the sentiments of beneficiaries. Boateng and Awunyor-Vitor (2013) also showed that the negative attitudes towards the scheme resulted from poor service quality and the lack of money. The lack of money as an influencing factor is consistent with Dalinjong and Laar's (2012) distinction between the insured and the uninsured. The authors recommended greater efforts in stakeholder engagement to design NHIs to ensure optimal access and quality of healthcare to all subscribers.

Boateng and Awunyor-Vitor's (2013), in line with Alhassan *et al*. (2015), found a negative association between technical quality and client-perceived quality care in Ghana, highlighting that efforts towards technical quality alone are not enough to translate into better client-perceived quality and willingness to utilize health services in NHI-accredited facilities. Dixon *et al*. (2013) found that wealth, gender and ethnicity all shape perception. Their findings also suggested a difference between initially enrolling in the scheme due to its potential benefits and perceptions from continued use. Amo-Adjei *et al*. (2016) also assessed the perception of service quality under the Ghanaian programme. Most respondents felt that the quality of health provided to subscribers was worse than for the uninsured. Thus, the pro-poor intervention was generally viewed as a failure, especially for women.

Andoh-Adjei *et al*. (2016) explored insured patients' perception of the capitation payment and its effect on their trust in their primary care provider and the scheme. Most patients negatively viewed capitation payment but had high trust in their providers. Fuseini and Anthony (2018) examined the linkage between awareness, uptake and experiences with the NHI. They found that people's experience during registration and use of the scheme had a lasting effect on their overall perceptions of the scheme. Duku *et al*. (2018) assessed the insured and uninsured people's perceptions regarding healthcare quality in Ghana. Being insured was associated with a lower perception of quality; perceptions were shaped by different treatment of the insured and uninsured at the health facilities. As a remedy, the Ghanaian scheme needs to be redesigned and reengineered to ensure better-quality healthcare for the insured and uninsured.

Nketiah-Amponsah *et al*. (2019) found that rural subscribers identified more with a better perception of the quality of services than urban subscribers, subject to socioeconomic and demographic characteristics. This called for variation in healthcare financing policies. Haw (2019) found a negative association between the utilization of the scheme and patient perceptions of quality of care. The differences across utilization categories were higher among private facility users; utilization was a negative predictor for perceptions, but the differences were more nuanced according to the type of facility used by the beneficiaries. Nsiah-Boateng *et al*. (2019) reported that most respondents knew about and were satisfied with the scheme services and healthcare providers; knowledge and years of enrolment in the scheme positively correlated with their level of satisfaction.

Overall, similar findings were reported in Nigeria. For instance, Ibrahim and Aliyu (2012) found that good patient-provider relationships in the Nigerian NHI drove positive attitudes towards the scheme. However, insufficient knowledge of operational aspects and poor satisfaction with the services drove negative attitudes. Mohammed *et al*. (2013) also examined Nigerian insured users' perspectives of their healthcare services responsiveness. Their expectations did not match their experiences with healthcare services regarding autonomy, communication and prompt attention. This could explain Akintaro and Adewoyin's (2015) finding of a low coverage rate of the scheme cultivating polarized opinions on its efficacy in curbing health challenges. The authors recommended aggressive mobilization and quality of care to improve public participation.

Mohammed *et al*. (2016) reported that beneficiaries perceived benefit-package access as more adequate but family member coverage as poor, hindering the scheme's adequate coverage. Afolabi (2018) also assessed client satisfaction in the Nigerian scheme's private and public primary health facilities. The perception of quality of care was higher in private facilities, but satisfaction with care was similar in both facilities. Clients' experiences and service affordability were predictors of satisfaction in both facilities. Yusuf *et al*. (2019) examined Nigerians' health insurance-related knowledge and attitudes toward the uptake of the health insurance scheme. Despite their positive attitude, most respondents had not heard of the scheme. There was an association between the respondents' knowledge and attitudes and their uptake. These studies highlight the importance of service quality and awareness of perceptions.

Kofoworola *et al*. (2020) found that clients' dissatisfaction with scheme services was high despite their acceptance of the scheme. They were concerned about the billing system, waiting times and staff attitudes. Michael *et al*. (2020) investigated the Nigerian youth service members' awareness, knowledge, and perception of the NHI. Despite their willingness to participate, they exhibited insufficient knowledge of its operations and an unimpressive perception of the scheme. Adewole *et al*. (2021) explored the factors associated with the skewed distribution of enrollees across Nigerian facilities. The study found a low trust in government and government policies among healthcare providers and enrollees. Few healthcare providers were willing to render services under the scheme due to poor trust, and enrollees were compelled to register with the few available healthcare providers.

Some studies have also been conducted in other countries besides Ghana and Nigeria. For instance, Zikusooka *et al*. (2009) examined the opinions of employees and employers in Uganda on the likely impact of the NHI on their private health insurance. Most respondents were willing to abandon private health insurance once the mandatory scheme was implemented. However, some expected poor quality of services in the scheme, so they said they would maintain their private insurance subscriptions. This points out the importance of the perceived quality of healthcare in driving sentiment toward NHIs. The findings also bring out an important observation; private healthcare can also determine the perception towards publicly-run schemes. Thus, in systems with well-functioning private healthcare, its impact on how beneficiaries view NHIs should be meticulously considered.

In line with Zikusooka *et al*. (2009), an examination by Mulupi *et al*. (2013) found that the negative views towards the Kenyan NHI were related to service quality and limited knowledge about key aspects such as income and risk cross-subsidization. Mulupi *et al*. (2013) also found that premium affordability, the timing of contributions and the extent to which population needs were met were major issues of concern among the respondents. In a Tanzanian study, Chomi *et al*. (2015) examined the perceptions of NHI subscribers and non-subscribers regarding the cross-subsidization of the poor as an indication of solidarity and their acceptance of redistributive mechanisms in Tanzania. A majority supported a redistributive policy, but the perceived benefits from the NHI influenced their support, the amount of subsidy considered, and trust in how the scheme was going to be managed.

Obse *et al*. (2015) explored the preferences for health insurance among formal sector employees in Ethiopia. The respondents exhibited little knowledge about the elements of health insurance, such as risk pooling and sharing. Quality of care, the comprehensiveness of benefit packages and the premium amount also shaped their attitude towards health insurance.

Yeshiwas *et al*. (2018) examined the demand for SHI among civil servants in Ethiopia. They found that having good awareness about health insurance and trust in a health insurance agency were significantly associated with the demand for health insurance among civil servants. Perceived healthcare organizational and professional readiness also influenced demand. The findings in these two studies highlight the importance of perceived quality of care and awareness of many aspects that make up the schemes.

In Croatia, a study by Mastilica and Babic-Bosanac (2002) showed that most respondents believed that everybody should have access to healthcare services, irrespective of insurance contributions. However, they had an unfavourable opinion of health insurance reform because they feared it would limit their social rights and increase their financial burden. Croatians preferred a voluntary scheme to an involuntary one due to the constraints and limitations of the latter structure, and their attitudes and sentiments highlighted the importance of design. The findings in this study have important implications for the design of NHIs: even with a strong appetite for universal health coverage, there are limits to design. Any government seeking to introduce an NHI should carefully consider those limits.

Yang *et al*. (2015) examined the influence of sociodemographic characteristics on perceptions and satisfaction with the NHI in Taiwan. Most respondents reported significant satisfaction with the scheme despite the differences in their sociodemographic characteristics. Therefore, NHIs can cater to people's needs despite their sociodemographic characteristics if implemented well. In Indonesia, Lestari and Djamaludin (2017) found that perceptions towards and motivation for the NHI program positively affected participation. However, the majority disagreed with socialization and reducing families' financial burden as the motivation behind the scheme. This shows that there are many drivers towards a positive inclination to participate in a scheme. It is crucial, therefore, for policymakers to pinpoint those drivers when designing NHIs to maximise the acceptance of the same.

Thapa *et al*. (2019) conducted a study to examine the perceptions of NHI enrollees in Nepal. The respondents were fully satisfied with the premium charged and the availability of drugs but dissatisfied with the waiting time, the registration process and the accessibility of service providers. The findings of this study highlight that the beneficiaries of an NHI can form different opinions and perceptions about different aspects of a single scheme. Therefore, it is in the best interest of the implementing authority to identify each of those aspects shaping the opinions and perceptions. This was also shown in a study by Ellis *et al*. (2021) in Australia.

They found an overall shift in perceptions, with a higher proportion of respondents now viewing the Australian healthcare system more positively. However, concerns regarding access to medicines, workforce capacity and aged care facilities remained.

iii. Healthcare providers' sentiments, attitudes and perceptions on NHIs

Other international studies focused on providers in their examinations. Among those is a study by Awoonor-Williams *et al*. (2016), who investigated how Ghana's NHI institutions interact with stakeholders. They reported negative perceptions towards the scheme due to significant misalignment in the form of delayed claims reimbursements and inadequate funding. Alhassan *et al*. (2016) examined whether systematic community engagement interventions significantly affected health workers' perspectives on the NHI. They found that, although perceptions towards the scheme had improved, delayed reimbursement of service providers remained a key concern. Sieverding *et al*. (2018) also explored private providers' perceptions in their participation in SHI in Ghana and Kenya. Most of them noted the accreditation process and claims reimbursement challenges as barriers to their participation

Sabitu and James (2005) found that most Nigerian healthcare providers were willing to participate in the scheme because they were optimistic about its success in bringing about necessary reforms to healthcare delivery. However, their positive attitude towards the scheme was dampened by inadequate knowledge of its operational principles. Another study by Okaro *et al*. (2010) reported positive attitudes towards the NHI among Nigerian radiographers. They believed that the scheme was capable of improving healthcare in Nigeria, and they were willing to participate in the scheme. However, they had insufficient knowledge of the scheme's operation principles. These studies highlight how awareness and knowledge shape the sentiments of providers, just as in the case of other stakeholders.

Adeniyi *et al*. (2010) examined the perceptions of Nigerian dentists towards their NHI. Most respondents had a fair knowledge of the scheme and viewed it as a good idea that would succeed if adequately implemented. They also believed that it would improve access, affordability and availability of the services and recognition of dentistry as a profession. A similar observation was drawn by Christina *et al*. (2014). The study found a significant association between education, awareness and knowledge of the scheme and registration into the scheme. However, in line with Alhassan *et al*. (2016) and Sieverding *et al*.'s (2018) findings in Ghana, a majority of Nigerian private practitioners viewed their scheme negatively because of the failure of payment by the health department and the losses that they incurred while participating in the scheme.

Lin *et al*. (2003) investigated the factors causing dissatisfaction with the NHI among Taiwanese physicians. Malpractice claims, claim complexity, excessive workload, decreased income, nurses' unavailability and the separation of dispensing medicine from medical practice were noted. Owili *et al*. (2019) explored the provider's perceived impact on Taiwan's NHI global budget allocation mechanism. The providers perceived a positive impact of the strategy. The authors, however, noted that its impact on demand and supply sides should be considered when adjusting allocation criteria. This is starkly different from what Zegraoui *et al*. (2018) reported in Morocco among liberal doctors. Nearly all respondents reported dissatisfaction with the national reference pricing and felt that remuneration was unfair. This dissatisfaction was eroding the gains from the NHI in terms of patient access to care.

Ackermann and Carroll (2003) found that a plurality of American physicians supported governmental legislation to establish an NHI, but not all of it should be paid for by the federal government. Alnaif (2006) found that most Saudi Arabian physicians believed that an NHI would improve access, create competition among providers, and lead to more regulations and utilization review of services. However, they believed it should be built on collaborative efforts rather than market competition. Similarly, Hardie and Critchley (2009) examined the perceptions of Australia's doctors, hospitals and healthcare systems. Their results showed that Australians trust Medicare more than private health insurers. Overall, they favoured a universal public health system collectively funded by the public purse due to perceived improvement in healthcare and fairness that would come with such a system.

iv. South African stakeholders' perceptions of the NHI

Despite the NHI still being impending in South Africa, studies have already been conducted to examine the perceptions of various stakeholders towards it. This could be due to the high expectations and general readiness for change in the healthcare system among South Africans. Implementing such a scheme has long been in the pipeline, and expectations for significant overhauls in the healthcare system were particularly strong with the end of apartheid in South Africa. Thus, nearly three decades later, when the expected changes may finally come to fruition, people will be forgiven for expecting sweeping changes. It could also indicate various stakeholders' concerns regarding the scheme. Even though they may see the need for the scheme, they may not necessarily agree with its proposed structure.

Of note, however, few studies have focussed on the perceptions of potential funders of the scheme, possibly due to the proposed mandatory prepayment structure. One of those few studies was by Shisana *et al*. (2006), in which South Africans’ willingness to finance the scheme was assessed on selected healthcare affordability and financing issues. This was just before the reaffirmation by the ruling party to implement the NHI system by further strengthening the public healthcare system and ensuring adequate provision of funding at their national conference in 2007 (NDoH, 2017). The study found that most South Africans who participated in the survey were willing to finance the NHI because of their perceived inadequacy in the healthcare system. A majority favoured raising taxes to improve healthcare coverage rather than attempting to keep tax rates low.

Harris *et al*. (2011) found that the willingness to cross-subsidise others and the choice of a financing system among South African health and education sector civil servants was determined by race, profession and education level. A third of their respondents were willing to cross-subsidize others, and half favoured a progressive financing system. These studies may be of importance as the government is addressing the finer details of how to finance the scheme. Goudge *et al*. (2012) examined individuals’ willingness to pre-pay for healthcare and their willingness to cross-subsidize the sick and the poor in Ghana, South Africa and Tanzania. A slight majority of the respondents in South Africa and Ghana but less so in Tanzania favoured a progressive financing system. However, in all three countries, a progressive system was favoured by the less well-off groups relative to the well-off groups.

A more significant number of studies focused on the perceptions of prospective beneficiaries of the scheme. One such study by McIntyre *et al*. (2009) examined the public perceptions of the scheme. The respondents expressed dissatisfaction with both health sectors, suggesting their readiness for change. However, despite their strong support for income cross-subsidies, they were not supportive of the notion of risk cross-subsidies and expressed concern about prepaying for poor-quality services. Evans and Shisana (2012) assessed the general public’s opinion on the NHI to explore gender differences in perceptions. They reported a broad public acceptance of the scheme to replace the current two-tiered system. The support for the scheme had increased due to the growth of public discourse. More females than males supported the scheme, reflecting its potential to impact gender equality positively.

Weimann and Stuttaford (2014) examined South African consumers' perspectives on the NHI. The respondents lacked trust in the scheme due to their experience with the current system. Lack of quality service, patient-centeredness and accessibility of providers were widespread concerns. Poor governance, lack of private-public intersectoral solidarity and rampant corruption in the system were also mentioned. Mathe (2015) examined the awareness and attitudes towards the NHI among university students in South Africa. Most students were aware of the scheme but lacked knowledge of how it would function. They also exhibited a low preference to use the scheme, with the preferences and attitudes subject to the respondents' family socioeconomic standing on their attitude to the scheme as a healthcare access platform.

Setswe *et al*. (2016) reported a generally positive perception and high expectations for the scheme in three provinces. Personal and family experiences and media reports drove these. Passchier (2017) explored the general public's perceptions regarding the barriers to the successful implementation of the scheme. Concerns were raised regarding the health system's inadequacies in governance, finance, workforce, technologies, information and service delivery. Booysen and Hongoro (2018), using the national health and nutrition examination survey, reported low awareness of the scheme among the respondents, despite the consensus regarding its need. Private-sector users with medical aid were more pessimistic about the scheme than public-sector users without medical aid. However, perceptions of lower cost and better affordability enhanced support for the scheme.

Douwes *et al*. (2018) explored civil society's views and experiences in pursuing UHC via implementing NHI in the country. The study reported that the path to UHC via the scheme rollout was going to be complex due to a lack of trust in the government's commitment and ability. The scheme could fail without a collective health commitment based on trust between the government and citizens and essential platforms for citizen participation. Tandwa *et al*. (2020) conducted an exploratory study to examine the levels of patient awareness of the NHI, which, they contended, was a requisite for meaningful engagement. Their results showed a low level of awareness, which they attributed to low prioritization in the community engagement process to ensure that the NHI was community and patient-centred.

An even more significant number of studies focused on healthcare providers. For instance, Blecher *et al*. (1995) examined general practitioners' attitudes to NHI and capitation as a reimbursement mechanism in that proposed scheme. They found that most general practitioners were willing to participate in some form of an NHI. Most respondents recognised the need for a change in how healthcare in South Africa was financed if universal health coverage was ever to be attained. However, the general practitioners varied significantly on how the scheme would look regarding payment mechanisms, workload issues and professional autonomy. This indicates that, while the rationale behind introducing the scheme may be sound and widely acceptable, its structure may reinforce that acceptance or breed a negative attitude towards it.

Bateman (2010) examined the views of doctors from varying disciplines regarding NHI. Nearly all the respondents in the study were concerned that the current healthcare system upon which the NHI would depend was in bad shape. Even with the plan to reform the system, South Africa did not have enough human and financial capital or the management capacity to run the scheme. Moosa *et al*. (2012) examined how private general practitioners would respond to different service delivery concepts and deal with the cost implications in the NHI. They appear to have an affordable and proactive response to the scheme's proposed capitation costing and fee setting. As such, proper engagement with the practitioners could garner support for the scheme and improve their perceptions.

Matsi (2015) examined the views of healthcare workers in Limpopo regarding the NHI. A majority had some knowledge of the scheme and were willing to participate. However, they did not have the details regarding their role, and they noted administrative, funding and personnel issues as significant challenges to the scheme. Surender *et al*. (2015) examined perceptions of private-sector general practitioners and found that the South African government would face significant opposition from them. This is due to concerns regarding remuneration, control, workload, autonomy, quality of care and working conditions. Thus, the government ought to directly address their concerns to ensure a stable transition and successful implementation of the reforms. With the current lack of doctors in the public sector, the government cannot afford the private sector to shun the scheme.

In another study by Govender (2016) in KwaZulu-Natal, community pharmacists showed a positive attitude towards the NHI, with the expected changes perceived as favourable. However, inadequacies in drugs, personnel and infrastructure were cited as significant challenges the NHI would have to contend with. Pienaar (2016), however, in an examination of the perceptions of pharmacists in managerial positions, found that a majority of the respondents saw the NHI as an inappropriate solution to rectify the inadequate public health system. This was contrary to Govender’s (2016) findings. Citing the lack of expertise and financial means, they asserted that the health system would be put under more strain should the scheme be implemented. However, they recognised the need for a financing scheme to fix health system problems.

Moosa *et al*. (2016) examined the general practitioners' views on the NHI. The respondents cited three major risks to the successful implementation of the scheme, namely, patient, organisational and government. However, they exhibited positive views based on their perceived ability to contract with the scheme competitively. They were also willing to work in teams, in line with the scheme's proposed structure. Surender *et al*. (2016) examined the views of general practitioners at one pilot site. The practitioners expressed frustrations due to a lack of suitable infrastructure, professional autonomy and apt contracting arrangements. Despite their strong support for the scheme, they were sceptical about private doctors' willingness to participate. These two studies show the need for private-sector engagement by the government.

Grewar (2017) examined the views of private healthcare managers towards implementing the scheme. The study found that they lacked knowledge of the scheme and exhibited high negativity towards the government's ability to implement it successfully. However, they showed a willingness to participate in its implementation. Hannah (2017) examined the private sector general practitioners' responses to the scheme. The respondents expressed concern regarding the government's commitment and capacity and the impact of the reforms on doctors' practices. Other concerns related to their degree of engagement with the proposed reforms, the perceived impact of the medical associations' influence on government policy, and the fragmentation within the medical profession.

Aluko (2018) examined community pharmacists' perceptions in Nelson Mandela Bay Metropole towards the NHI. The analysis of the themes identified revealed that the community pharmacists were aware of the NHI. They also saw the NHI as an advantage to the system and displayed a positive attitude towards it. However, they were uncertain as to how it was going to be implemented. Molokomme *et al*. (2018) examined the perceptions of professional nurses towards the scheme. They acknowledged its principles but had concerns regarding personnel, equipment and infrastructure sufficiency. They also felt that the government was not ready for the scheme due to the perceived non-transparency on outcomes from the scheme's pilot sites, mismanagement of funds, irregular expenditure and poor communication.

Tshitangano and Olaniyi (2018) assessed community health workers' knowledge regarding their roles in the scheme. The findings revealed that they lacked adequate knowledge of their roles, contributing to their negative perception of the NHI. The authors recommended that the South African qualification authority health promoter unit standards be reviewed and that community health workers be mentored as a remedy. Gaqavu and Mash (2019) examined the perceptions of general practitioners towards the scheme. Most respondents believed the scheme would improve healthcare but were concerned about the lack of administrative capacity and human resource plans. Further, the lack of information on packages, accreditation, remuneration and patient allocation contributed to the negative perceptions.

Matthew and Mash (2019), in an examination of private practitioners' views on the scheme, found that most of them viewed the scheme negatively. This was because of the perceived antagonistic stance of the government towards the private sector. They were also concerned about the government's financial and administrative capacity in running the scheme, the sustainability of reimbursement for them if they were to be part of the scheme and the prospect of higher workloads with reduced quality of care. Murphy and Moosa (2021) found that district health managers viewed the scheme as imperative for addressing problems in the South African healthcare system. However, they lacked clarity on its implementation strategies due to a lack of opportunities for engagement in policy formulation due to the detachment between national and provincial governments in a rigid top-down hierarchy.

Most of these studies show that some stakeholders view the scheme positively and understand the need for it due to the poor state of the South African healthcare system and how unfit for purpose it is. However, other stakeholders, even though they understand why the scheme is being introduced, are concerned about how it will operate in the South African healthcare system. The third group of stakeholders is the uniformed one. Poor communication on the part of the government could be shaping their attitudes and perceptions of the scheme. Thus, greater policy dialogue and clarification could tackle many of the concerns expressed in the analysis. Accordingly, the government needs to ensure adequate decentralisation of healthcare governance and to engage and capacitate district managers to operationalise some of the provisions in the scheme.

5.3 Methodology approach for stakeholders' perceptions analysis

In this section, the methodological approach followed in this chapter is described. As alluded to before, choosing the appropriate approach is crucial to achieving the objectives of any study. Herein, a phenomenological qualitative approach was employed to examine various healthcare stakeholders' perceptions towards the NHI. According to Horrigan-Kelly et al. (2016), this approach was considered suitable because it enables researchers to investigate a phenomenon or event by describing and interpreting participants' lived experiences. In this case, the phenomenon is the NHI, and the lived experiences drive stakeholder sentiments. Busetto *et al*. (2020) also noted that such an approach is key to understanding the underlying reasons, opinions, attitudes, sentiments and motivations of actors, stakeholders and any interested parties regarding any subject.

Secondary data from news articles in textual form that were available online were employed in this analysis. This section starts by explaining the choice of news articles as a source of data despite some weaknesses and disadvantages they pose. A description of the sampling of the relevant articles from a population of news articles, including the search terms used to search for articles, follows. The description also extends to the inclusion and exclusion criteria used to select only the articles considered relevant to the analysis of stakeholder sentiments. Finally, a description of the text pre-processing in preparation for the analysis and the description of the Stanford CoreNLP, a Java-based annotation pipeline framework that was used to determine the polarity and polarity scores of the articles and sentences in those articles, follows.

5.3.1 The choice of news articles as a source of sentiment data

The choice of news articles as the data source was based on how policymaking highly depends on soft information, which includes more subjective variables in sentiments towards policies (Shapiro *et al*., 2020). A good source of that information where sentiments are expressed is in news articles. They do not only reflect the sentiments of the writers and the subjects on which they are based, but they can also shape the sentiments of readers on the subject on which they are written (Protess and McCombs, 2016; Tofangchi and Karamzadeh, 2017; McCombs and Valenzuela, 2020). This has been seen in many areas, prevalent in policy issues, including healthcare reform (Shapiro *et al*., 2020; Ye and Xue, 2021). However, the usefulness of news articles in measuring sentiments is primarily defined in the field of finance (Khedr and Yaseen, 2017; Vanstone *et al*., 2019; Chen and Chen, 2019).

Further, employing news articles allow studies to access a broader range of views (Ribeiro *et al*., 2016). For the NHI, such a range would not have been possible if other data sources, such as interviews and focus groups, had been used. This approach also allowed the study to examine and track changes in opinions over time (Nghiem *et al*., 2016). This is especially important because as more information enters the public domain and people become increasingly informed, they are likely to change their opinions about a subject (Kühne and Schemer, 2015). Climate change is a case in point (Palm *et al.*, 2017). Other occurrences, such as the current covid-19 pandemic and the litigations regarding state capture, could have changed opinions and perceptions towards the NHI and the ability of the government to implement it successfully and sustainably.

Further, publishers have the expertise to identify the key informants when authoring articles. This ability and expertise make news articles attractive as a source of information. However, they are very susceptible to biases, and the independence of both the publishers and respondents is arduous to determine (Martin and Yurukoglu, 2017). Some vested interests can influence the identification of respondents, what the respondents say and how the articles are written (Korthagen, 2015; Bennett, 2016). In addition, the articles may feature respondents that are not as informed on the subject as they claim to be, leading to less reliable information, fake news and biases in some articles (Li and Wagner, 2020). While these problems are challenging, employing the articles and analysing the information to recognise their presence can help reach more balanced conclusions.

5.3.2 The sampling and data collection processes of the news articles

Adopting the correct data collection method is especially important because it determines the credibility and adequacy of the data used in any analysis and the longevity and generalizability of the findings (Gill *et al.*, 2008; Sutton and Austin, 2015). The next step involves defining the sample out of a population of news articles. This comprised all the news articles referring to the NHI published after the June 2017 white paper release. The aim was to exclude the highly speculative articles published before more information on the scheme was availed by the government in the white paper. Accordingly, the search for news articles was run on Google under the "News" tab as:

National Health Insurance + NHI + South Africa.

From the initial results of the search, some news articles made insignificant references to the NHI while focusing on other issues such as corruption, governance and finance, among others. To exclude these articles from the sample, only those with the phrase "National health insurance" or its abbreviation "NHI" in their titles were chosen. Further, articles in the sample based on NHIs in other countries were excluded. Finally, articles were only included if the phrase "National health insurance" or its abbreviation "NHI" were one of the keywords identified in the articles, together with any keywords referring to either the rationale or operational aspects of the scheme. The text of each article was run through a keyword extractor program, MonkeyLearn (2021), which allows for the extraction of the most used and most important words and expressions from a text, to achieve this.

From the program's output, the keyword, the number of times the keyword appeared in the processed text, and the relevance score that shows how important the keyword is in the text could be identified. Figure 5.3 below depicts the articles' search and selection process followed in this chapter. The initial search yielded a total of 6610 articles. However, the exclusion of articles without the phrase "National health insurance" or its abbreviation "NHI" in their titles resulted in a total of only 324 articles remaining. The number of articles dropped even further to 152 when those that did not make specific reference to South Africa or the South African NHI were excluded. Finally, excluding articles without relevant keywords resulted in only 136 remaining. From these articles, there was a total of 4491 sentences, including the headings, which were analysed.

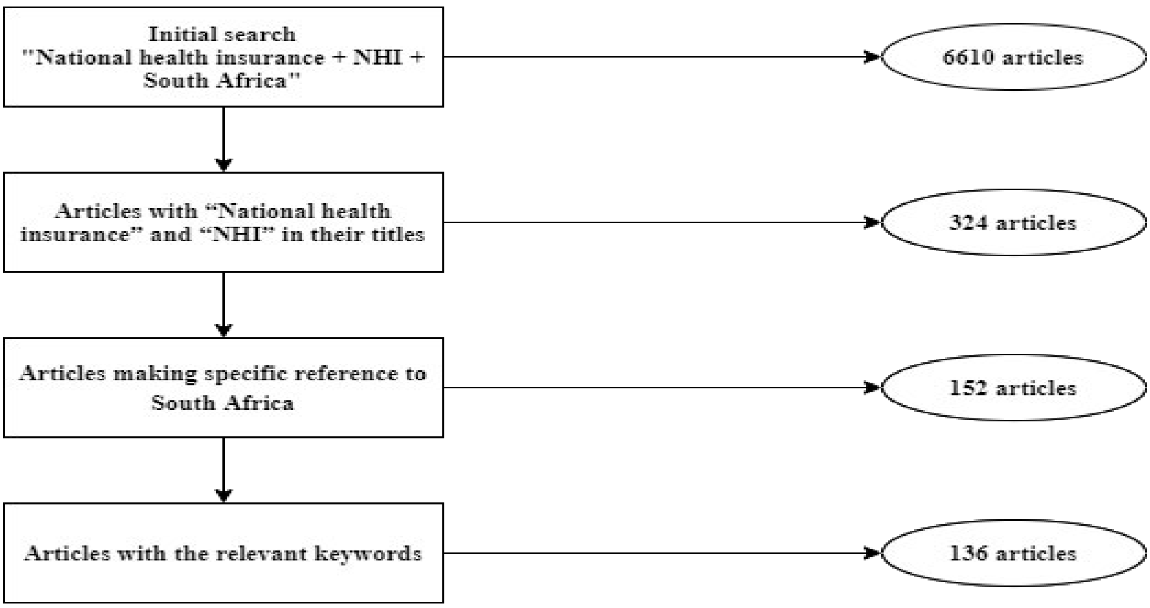


Figure 5. 3 Articles search and selection process

Source: Own depiction (2021)

5.3.3 The analytical framework for news articles

From data collection, the analysis architecture proposed by Zhang *et al*. (2009) was used to examine the sentiment in the articles. The procedure comprises two steps - sentence sentiment analysis to determine the sentiment in each sentence and document sentiment aggregation to determine the overall sentiment of the full news article. The procedure is aimed at accounting for the subtlety in expressions of sentences in news articles (Ravi and Ravi, 2015; Serrano-Guerrero *et al*., 2015). Further, decomposing the articles into their constituent sentences and then determining the sentiment polarity of each sentence could help to identify the themes and subthemes relating to the rationale and mechanical aspects of the NHI that drive sentiment. It is from these sentences, which were treated as atomic units, that the overall polarity of the entire news article is determined (Zhang *et al*., 2009)

Figure 5.4 below exhibits the procedure followed in determining the sentiment from news articles. Before polarity calculation, there is a need to construct dependency trees as simply predicting the polarity of a sentence based on the subjective words it contains may not be sufficient due to the subtlety of language expression (Che *et al*., 2008; Zhang *et al*., 2009). A more thorough analysis of the syntactic structure is, therefore, necessary. This was achieved using a grammar dependency parser as one of the annotators. Subsequently, sentence polarity prediction followed based on the constituent words' sentiment polarities. According to Wilson *et al*. (2009), a word's polarity can take three forms - prior polarity, modified polarity, and dynamic. Prior polarity – where polarity information is obtained from a specific dictionary of subjective words predefined based on a domain of sentiment-bearing adjectives – was used.

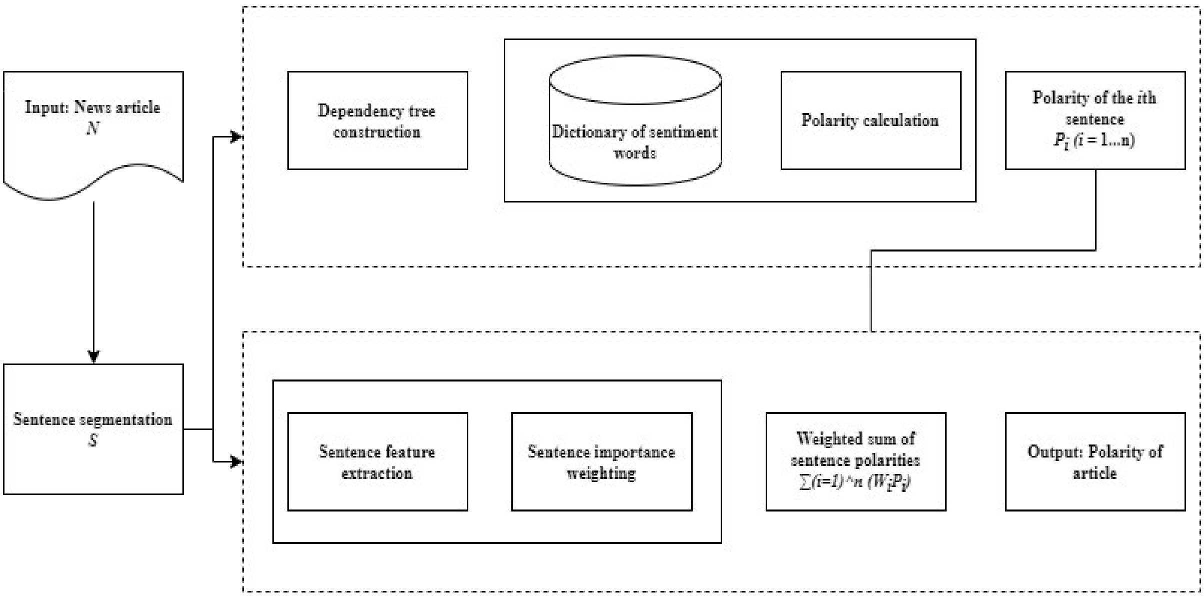


Figure 5. 4 Procedure to calculate the sentiment polarity of sentences and articles

Source: Adapted from Zhang et al. (2009)

For article-level sentiment analysis, shown in Figure 5.4, there is a need first to determine the importance of the weighting of constituent sentences in an article (Zhang *et al*., 2009). While there are several methods to determine article-level polarities and scores, some of them do not consider the context of a sentence (Pang *et al*., 2002; Tsou *et al*., 2005), while some require manual annotation of a training dataset (Mao and Lebanon, 2006; McDonald *et al*., 2007). Thus, following Zhang *et al*. (2009), different weights were assigned to the sentences to account for variations in their importance and contribution to the overall article polarity. This was based on five features, namely, the position of the sentence, the sentence's term weights, the similarity between the sentence and the title, the occurrence of keywords, and the first-person mode. This was achieved by employing a sentence weight parser in the sentiment annotator.

The procedure above was achieved using the Stanford CoreNLP, a Java-based annotation pipeline framework. CoreNLP enables users to derive various linguistic annotations for text, including sentiment (Stanford CoreNLP, 2021). While there are several alternatives for natural language analysis, Stanford CoreNLP remains one of the most used toolkits. Its architecture is also basic and straightforward: the raw text is put into an annotation object, and then a sequence of annotators adds information in an analysis pipeline (Bloch, 2008). This basic architecture has proven to be successful because it allows for quick linguistic annotations for text and has a minimal conceptual footprint using plain Java objects. These are attractive qualities when analysing sentiment from news articles. Stanford CoreNLP (2020) recommends batch processing for more efficient text analysis. Accordingly, the new articles were processed in a batch.

For it to function, Stanford CoreNLP comes with many annotators that can work with any character encoding using Java's Unicode support. Figure 5.5 shows the annotators employed, identified as necessary to process text in sentences and gauge polarity. The *tokenize* annotator was used to convert text into a sequence of tokens using the Penn Treebank-style tokenizer, extended to handle noisy and web text. The ssplit annotator was used to split the token sequences into sentences, while the parse annotator, the grammar dependency parser, provided a full syntactic analysis, including both constituent and dependency representation, based on a probabilistic parser (Klein and Manning, 2003; de Marneffe *et al*., 2006). Finally, the sentiment annotator executed the sentiment analysis with a compositional model over the binarized trees using deep machine learning (Socher *et al*., 2013).

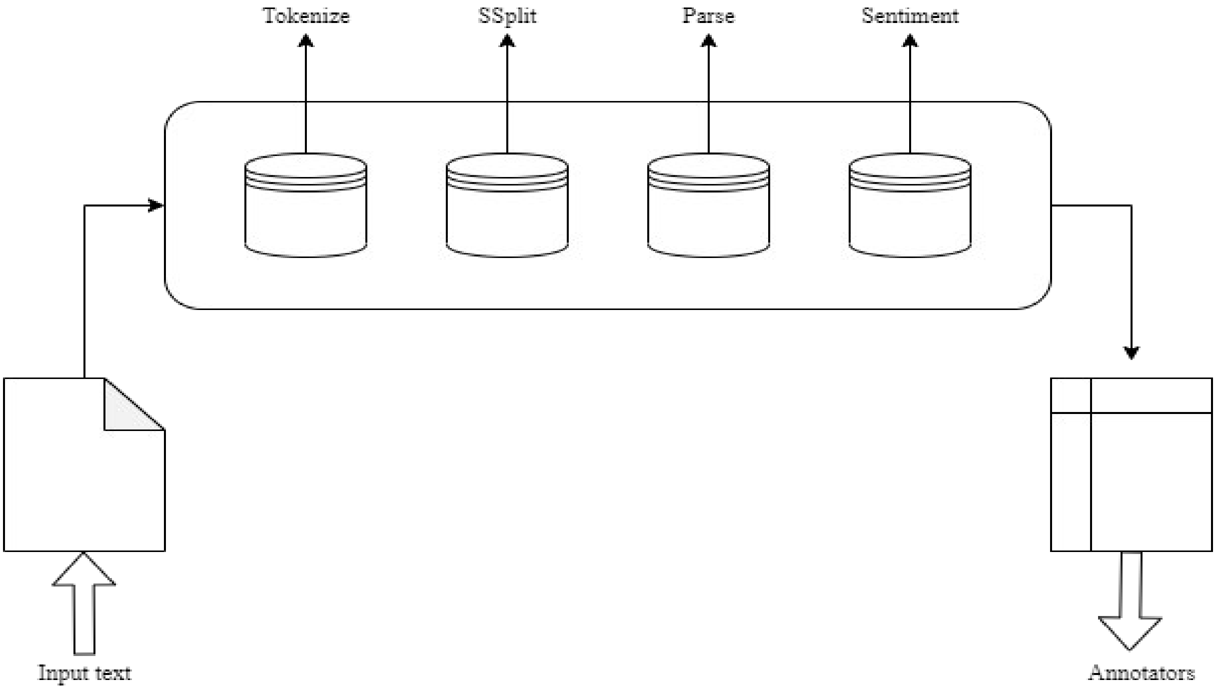


Figure 5. 5 CoreNLP pipeline for sentiment analysis

Source: Adapted from Stanford CoreNLP (2020).

Nodes of a binarized tree of each sentence, including the root nodes, are given a sentiment score. According to Socher *et al*. (2013), the sentiment treebank on which the sentiment annotator depends includes fine-grained sentiment labels for phrases in the parse trees. These enable the sentiment annotator to assign different weights to the sentences to account for variations in their importance in an article and adjust their contribution to the overall polarity, as suggested and done by Zhang *et al*. (2009). However, it remains a challenge for sentiment compositionality. As such, Socher *et al*. (2013) introduced the Recursive Neural Tensor Network, which significantly improves single sentence classification, prediction of fine-grained sentiment labels for phrases and the capturing of the effect of contrastive conjunctions as well as negation and its scope at various tree levels for both positive and negative phrases.

Finally, the possibility that the covid-19 pandemic's impact on the healthcare system and how the government managed it from a policy perspective may have impacted various stakeholders' sentiments towards the NHI was explored. The pandemic's implications for healthcare systems are wide-ranging and well-documented (Blumenthal *et al*., 2020; Fiorillo and Gorwood, 2020). Accordingly, among the same articles selected for analysis, the sentences that referred to "covid-19", "coronavirus", or "pandemic" were extracted and analysed separately to determine their sentiment polarity and scores. This approach follows many studies that have explored the need and opportunities for reform and health systems' preparedness and resilience to shocks using the pandemic as a case study (King, 2020; Gerke *et al*., 2020; Maulik *et al*., 2020; Sundararaman, 2020; Watt, 2020; Assefa *et al*., 2021, Haldane *et al*., 2021).

Overall, the use of news articles and the natural language processing technique to understand stakeholders' sentiments is in line with how natural language processing is apt in structuring narrative information in healthcare (Rumshisky *et al*., 2016; Young *et al*., 2019; Koleck *et al*., 2019). It can capture unstructured healthcare information, analyze its grammatical structure, and determine its meaning to be used in decision-making (Iroju and Olaleke, 2015). This is particularly important because the healthcare system is knowledge-driven, consisting of vast and growing volumes of narrative information, all typically stored in unstructured and non-standardized formats. It is, therefore, not surprising that natural language processing has gained popularity in clinical evidence-based research and quality improvement (Uzuner and Stubbs, 2015; Névéol and Zweigenbaum, 2015, Yim *et al*., 2016).

5.4 Results and analysis of sentiment in news articles

As highlighted above, in this chapter, stakeholders' sentiments were examined using news articles and a natural language processing technique that allowed article and sentence-level analysis. Accordingly, this section presents the results of article-level sentiment analysis and sentence-level analysis – article sentences in general and the sentences relating to the current pandemic. Finally, the themes identified in the articles are presented and discussed.

5.4.1 Aggregate sentiment from news articles

The aggregate sentiment polarities and the polarity scores at the news article level are presented in Figure 5.6 below. Most articles fell into the neutral sentiment category (51 percent). This resulted from a dilution between negative and positive polarity scores of sentences. There are some aspects of the NHI that some stakeholders have accepted and others to which they are opposed, consistent with reports from previous studies (McIntyre *et al*., 2009; Matsi, 2015; Govender, 2016; Booysen and Hongoro, 2018; Molokomme *et al*., 2018; Gaqavu and Mash, 2019; Murphy and Moosa, 2021). Most of these studies reported a general acceptance and need for reform due state of the current healthcare system and the general unaffordability of quality services. However, they are concerned about the structure of the proposed scheme and its ability to bring about the necessary reform (Govender, 2016; Murphy and Moosa, 2021).

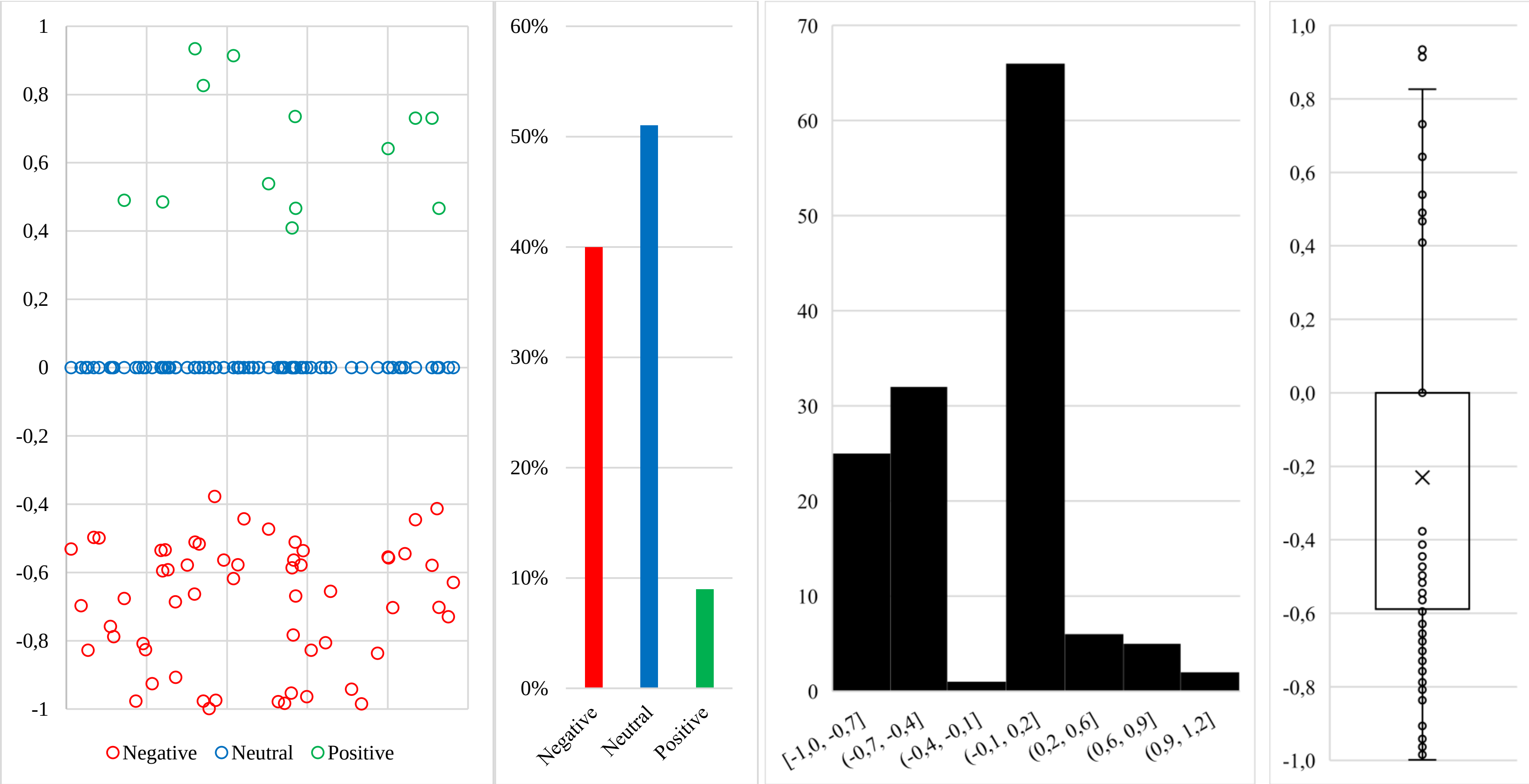


Figure 5. 6 News articles' aggregate sentiment polarity and polarity scores

Source: Author's own estimations (2022)

However, the news articles were more likely to be negative (40 percent) than positive (9 percent). The histogram – particularly its skewed distribution and the bin -0.1 – 0.2 exhibiting the largest frequency – highlights this observation. The accompanying box plot shows that the mean value is just below -0.2 (-20 percent), indicating a greater magnitude of negative polarities than positive ones. This is also highlighted in the scatterplot where a significant number of articles' polarity scores plotted between -0.8 (-80 percent) and -1.0 (-100 percent). Such a result, which is in line with some pre-implementation studies (Weimann and Stuttaford, 2014; Matthew and Mash, 2019), should concern South African policymakers tasked with bringing the NHI into full function in the South African healthcare system.

Weimann and Stuttaford (2014) found that political will for the policy was low due to competing priorities and lack of resources while Matthew and Mash (2019) concluded that implementing a social health insurance system was the most viable option as it would generate sufficient revenue and contribute to the goal of achieving universal health coverage. However, this option would require significant political will and administrative capacity to overcome implementation challenges. Both studies highlight the importance of political will and feasibility in the successful implementation of the NHI policy in South Africa.

Further, the few articles with positive polarities mainly focused on the rationale of the scheme and some had government officials as the respondents. Aspects such as the unsustainability of the current system, the need for cross-subsidisation and inequities and inequality dominated these articles. However, they did not contain much detail on the technical aspects of the scheme. In literature, studies that reported positive views, perceptions, attitudes and sentiments towards the scheme also focussed on the same aspects relating to the rationale as the driver of that positivity (Shisana *et al*., 2006; Harris *et al*., 2011; Goudge *et al*., 2012; Evans and Shisana, 2012; Murphy and Moosa, 2021). It should be a cause for concern if the government cannot convince people about the scheme's viability based on its technical aspects but on the rationale.

5.4.2 Constituent sentiment from news article sentences

The high percentage of neutral polarity designation from the article-level sentiment analysis was attributed to the possibility of dilution between the negative and positive polarity scores. Therefore, sentence-level sentiment analysis was conducted, the results from which are presented in Figure 5.7 below. As in the case above, the sentence polarities were grouped into three sentiment categories – positive in green, negative in red and neutral in blue. There was a significant change in the distribution of sentiment polarities and scores relative to the article-level analysis. A significant portion – a total of 65 percent – of the sentences fell into the negative sentiment category, up from 40 percent previously. Likewise, the positive sentiment polarity sentences constituted 28 percent, up from 9 percent. The neutral sentiment polarity sentences were only 8 percent, down from 51 percent.

This indicates that there was a significant number of negative sentences in articles with positive and neutral aggregate polarities and polarity scores than vice versa. Without dilution of polarity scores, as in the article-level analysis, both negative and positive sentiment polarity percentages went up while the neutral percentage went down. This observation highlights the demerits of aggregation when examining sentiment. Overall, these results are in line with the negative sentiments reported in South African studies (Bateman, 2010; Weimann and Stuttaford, 2014; Matthew and Mash, 2019; Matsi, 2015; Govender, 2016; Booysen and Hongoro, 2018; Molokomme *et al*., 2018; Gaqavu and Mash, 2019; Murphy and Moosa, 2021). Judging from these results at face value, there is a possibility that the sentiment towards the NHI could be significantly negative to the extent that it threatens the scheme's success.

Examining the distribution of the polarity scores paints an even more negative picture. From the scatterplot, most negative scores were concentrated between -80 percent and -99 percent, while most positive scores were between 5 percent and 25 percent. This indicates that, on average, the magnitude of negative sentiment was much higher than that of positive sentiment. Likewise, the histogram is significantly weighted towards the negative side, with the highest frequency between -99.93 percent and -86.62 percent. Higher frequencies for the positive sentiment category were generally below the 33.23 percent mark. The box plot of the sentence sentiment polarity scores also exhibited a mean value close to -30 percent. This suggests that most negative statements were more directly and strongly stated than positive ones.

The differences in the magnitude of the polarity scores could resulted from having two distinct sources of sentiment – the rationale and the technical aspects of the scheme. Stakeholders against the NHI as currently conceived mainly point out its technical flaws (Bateman, 2010; Pienaar, 2016; Moosa *et al*., 2016; Grewar, 2017; Hannah, 2017; Molokomme *et al*., 2018; Matthew and Mash, 2019). This group comprises private healthcare groups with special interests in how the healthcare system will look after the scheme has been implemented fully. These include the Private Practitioners Forum, the Psychology Society of South Africa, the Radiological Society of South Africa, the Democratic Nursing Organisation of South Africa, the South African Medical Association and the Pharmaceutical Society of South Africa (Mash, 2019; Kleintjes *et al*., 2021; Christmals *et al*., 2021).

On the other hand, the stakeholders in favour of introducing the scheme in South Africa mostly point out its rationale. This group of stakeholders may be dominated by individuals who only have an idea of what the scheme constitutes but lack the details of technical aspects. This supposition is consistent with some studies that showed that several stakeholders in South Africa lacked awareness of the operational aspects of the scheme (Mathe, 2015; Matsi, 2015; Oladimeji *et al*., 2017; Booysen and Hongoro, 2018; Tandwa *et al*., 2020). Surprisingly, some healthcare providers and personnel with significantly essential roles in implementing the scheme do not understand what their role will look like in the scheme. Yet, many of them have expressed support for the scheme (Grewar, 2017; Tshitangano and Olaniyi, 2018).

There is also the issue of dominant political interests in proposed reforms (Gilson, 2019). The proposed healthcare reforms are quintessentially political, especially given the size of the scheme. Thus, interests will compete as the current institutional status quo is challenged. Unsurprisingly, the NHI reform is being contested primarily by the private sector actors. Most of them view the government as antagonistic to the private sector because the former blames the latter for problems in the healthcare system, such as unsustainable pricing and gross inequities (Matthew and Mash, 2019). As such, the influence of that view on the news articles and the potential for biases from the private sector cannot be ignored as they attempt to defend themselves while highlighting the complicity of the government in healthcare problems by highlighting inadequacies and faults in the policies and reforms proposed.

In addition to examining the distribution of the aggregate sentiment polarity and polarity scores at the article and sentence levels, polarity scores were also examined over time, as reported in Figure 5.8, to see whether their distribution was changing over time as new information was becoming available. This approach follows several studies examining the change in sentiments, views and opinions regarding the covid-19 pandemic over time (Aslam *et al*., 2020; Ahmed *et al*., 2021; Rustam *et al*., 2021). Based on the headlines, the skewed distribution of polarities and polarity scores seen in Figure 5.6 above was confirmed. There was evidence of slight changes over time, most of which were between negative and neutral polarity. The same examination using the news article sentences showed more dominance of the negative polarities over time, punctuated here and there by positive ones.

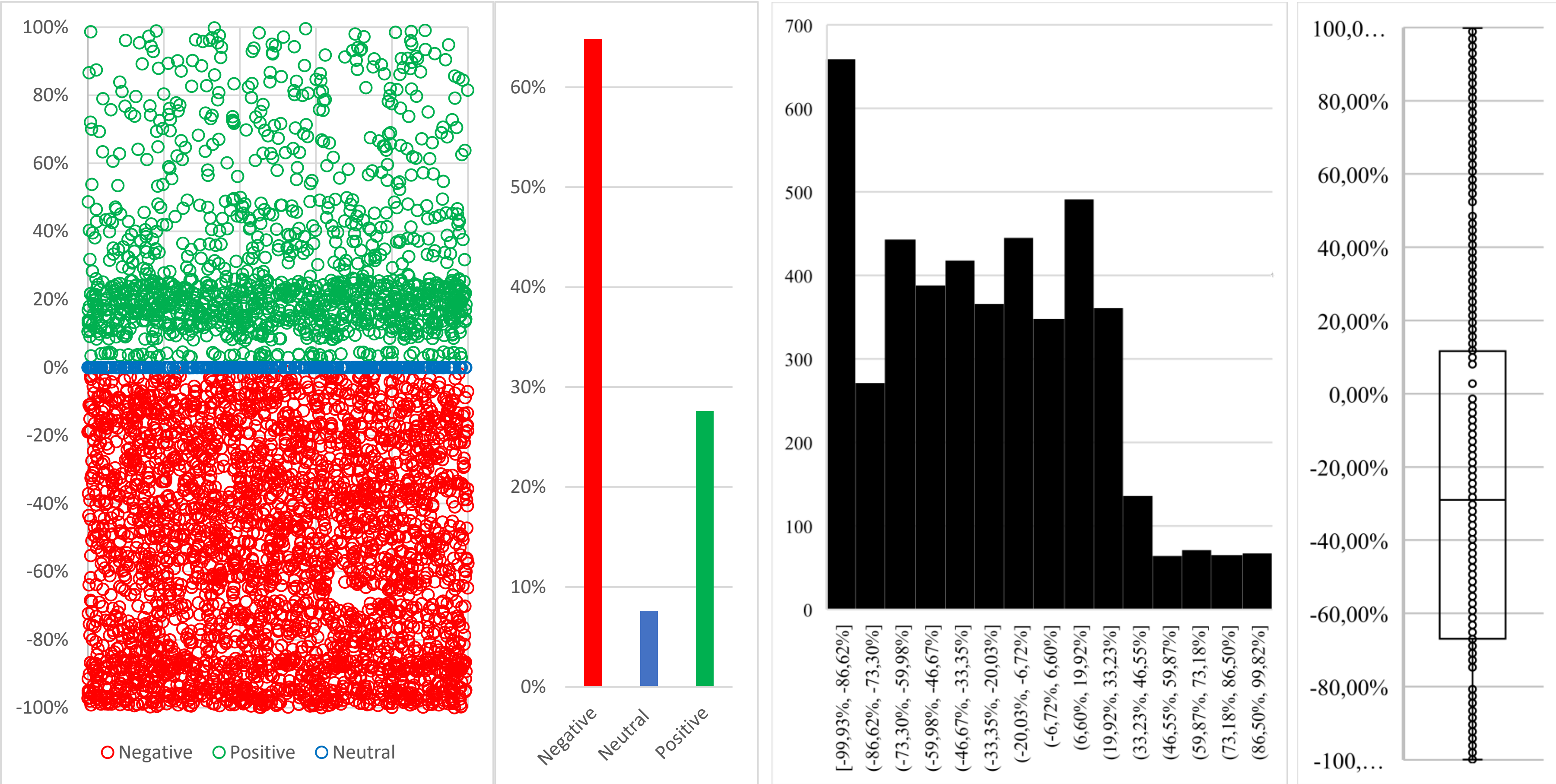


Figure 5. 7 Constituent sentences' sentiment polarity and polarity scores

Source: Author's own estimations (2022)

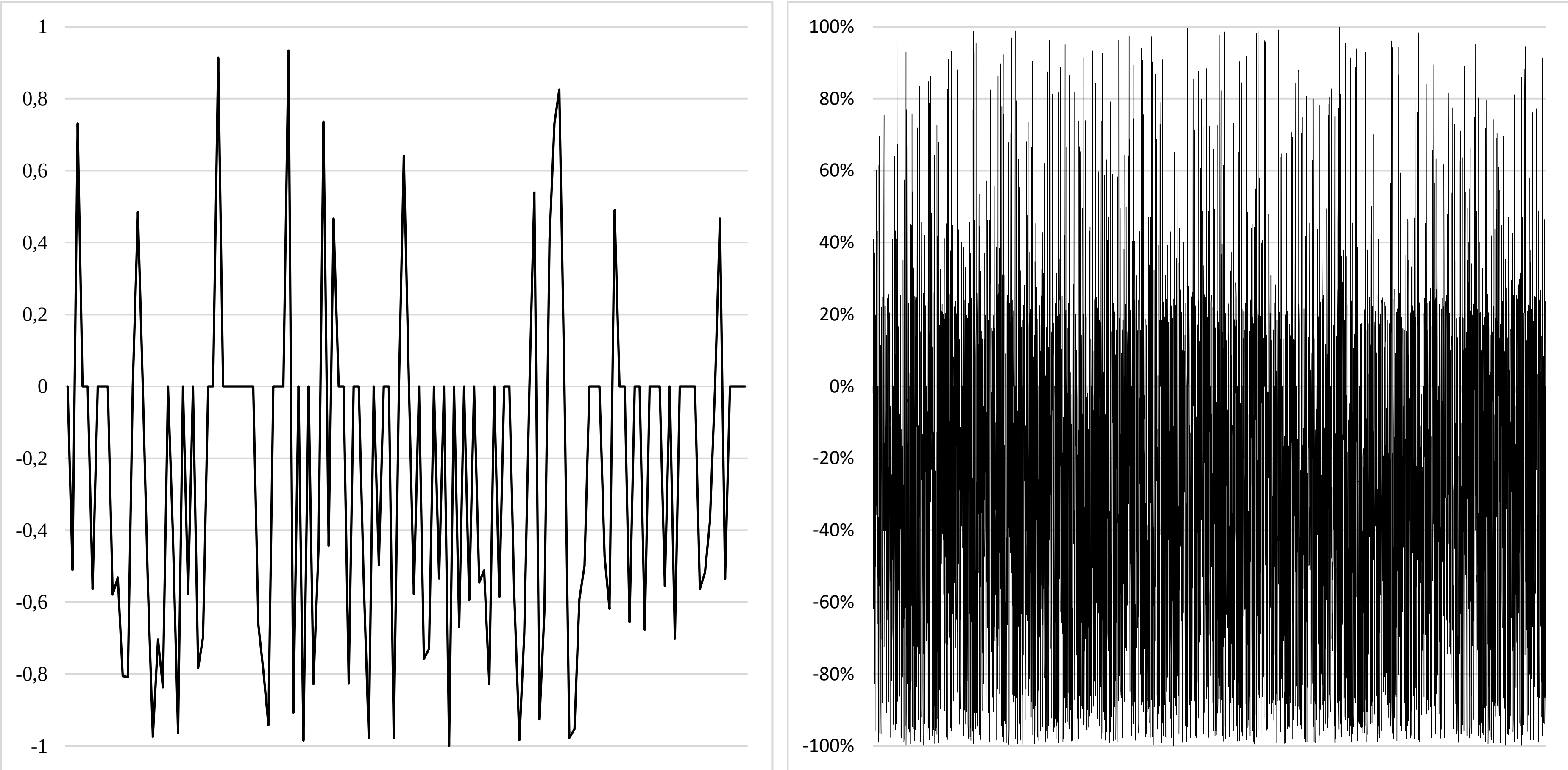


Figure 5. 8 Polarity scores of article headlines and sentences over time

Source: Author's own estimations (2022)

These observations suggest that the government has improved in availing relevant information to essential stakeholders. This could be in terms of engagement and consultations with the stakeholders, which is in line with some studies that reported low awareness among stakeholders in South Africa (Mathe, 2015; Matsi, 2015; Oladimeji *et al*., 2017; Booysen and Hongoro, 2018; Tandwa *et al*., 2020). It could also be in terms of the failure to provide important information on vital aspects of the scheme itself. This includes the tax instruments to be used or the definition of the benefits packages. Therefore, as long as that information is still missing, most stakeholders may oppose the scheme. This matches recent reporting of negative sentiments, attitudes and opinions towards the scheme even after its gazetting by the government (Murphy and Moosa, 2021).

In addition to poor awareness of the scheme, there is also the issue of political interests mentioned above. Some stakeholders will likely remain opposed to the scheme; the private sector, especially medical insurance schemes, will be permanently affected by the introduction of the scheme in terms of the way it operates and the level of profits for providers therein (Okorafor *et al*., 2012; Passchier, 2017). However, it should be noted that the government's success in implementing the NHI depends profoundly on the willingness of the private sector to participate in the scheme (Ramjee *et al*., 2013). The public sector is ill-equipped to deal with the sharp increase in demand for healthcare services that will come with the scheme (Moosa *et al*., 2016; Smith *et al*., 2018). Therefore, the significantly negative sentiment from the private sector should concern the government.

5.4.3 The covid-19 pandemic effects on stakeholder sentiment

As mentioned above, the possible impact of the covid-19 pandemic on stakeholders' sentiments towards the NHI was also examined based on the possibility that the pandemic may have impacted stakeholders' sentiments positively by highlighting the inadequacies in the healthcare system and the need for reform that has been proposed in the scheme (McKinney *et al*., 2020; Hiam and Yates, 2021). On the other hand, the pandemic may have highlighted the poor ability of the government to manage and reorganise the healthcare system as the root cause of the inadequate response to the pandemic (Mosam *et al*., 2020; Stiegler *et al*., 2020). The latter supposition, if true, means that the government may not be able to run the proposed scheme effectively. Therefore, polarity and polarity scores of sentences that referenced the pandemic were examined to determine its impact, as reported in figure 5.9 below.

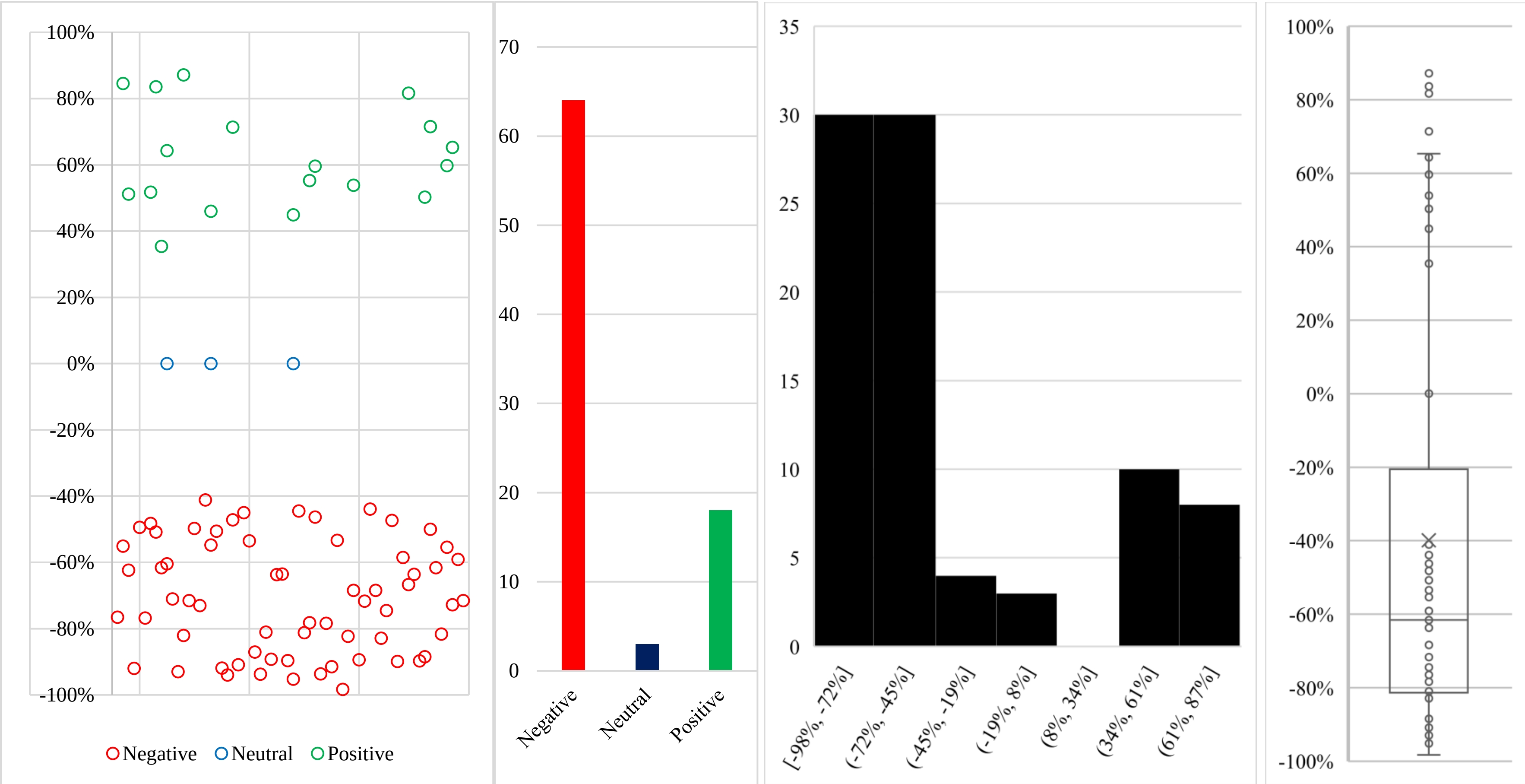


Figure 5. 9 Sentiment polarity and scores of sentences that referred to the pandemic

Source: Author's own estimations (2022)

Notably, most statements that referred to the pandemic (75 percent) were negative; the histogram is significantly weighted towards the negative side, and the highest frequency was between -98 and -72 percent and between -72 and -45 percent. The box plot also exhibits a mean value close to -60 percent. A further examination of the negative sentences showed that concern mainly was in how the government responded to the pandemic or the prospect of the NHI in its ability to deal with the South African healthcare system challenges. This is in line with studies that pointed out the poor administrative capacity in South Africa (Rusch *et al*., 2012; Marten *et al*., 2014; Twala, 2014; Pillay-van Wyk *et al*., 2016; Passchier, 2017; Blecher *et al*., 2019). Only 21 and 4 percent of the sentences had positive and neutral sentiment polarity, respectively.

A majority of the positive sentiment polarity sentences emphasised how the pandemic had exposed various systemic inadequacies. This is in line with studies that found that support for the scheme was mainly linked to its rationale (Matsi, 2015; Govender, 2016; Moosa *et al*., 2016; Surender *et al*., 2016; Aluko, 2018; Gaqavu and Mash, 2019; Murphy and Moosa, 2021). However, the skewed distribution and the mean value close to -60 percent on the box plot of the sentiment scores show that the negative polarity scores were generally higher in magnitude than the positive ones. The scatterplot also highlights the same observation. This suggests that how the pandemic was handled and how it affected the healthcare system may have cast doubt on the perceived viability of the scheme. It also highlights the need for government to address its administrative capacity to get stakeholders' support.

5.4.4 The thematic analysis of issues identified in the text

In the preceding sections, article and sentence polarities were examined to determine the sentiment towards the NHI. The findings from these sections revealed that sentiment towards the scheme was generally negative. This should concern the government in its efforts to introduce a successful scheme. This section attempted to examine the drivers behind the sentiment polarities and polarity score patterns observed in these previous sections. While mapping out the sentiments of stakeholders was the first and critical step, addressing the threats posed by significantly negative sentiment or promoting positive sentiments towards the scheme to enhance support requires determining the explanations behind the observed sentiment polarities and polarity scores distribution.

Several themes were identified in this regard. The first one is policymaking, in which issues relating to the various government actions, responsibilities and decisions are grouped. In the second theme, issues relating to the NHI's impact on the private sector in terms of how it operates were identified. The third theme, financing and funding issues of the scheme, contained issues relating to the sufficiency and sustainability of funding for the scheme. The fourth theme is on issues relating to the requisite regulations and constitutionality thereof, while the fifth is on the issues relating to the current healthcare system status and its implication for the scheme. Finally, the sixth theme is on the healthcare system governance and is centred on the ability of the government to run the scheme. Issues relating to the rationale of the scheme and the covid-19 pandemic were grouped as two additional themes.

(a) Policy issues as stakeholders' sentiment drivers

From the sentences, several policy issues listed in Table 5.1 were identified. One relates to the inadequacy and complexity of the accreditation processes for private sector providers. These processes have not been implemented despite the imminency of the NHI and the extent to which it will rely on private sector providers. It is consistent with the finding by Gaqavu and Mash (2019) that the lack of clarity regarding the accreditation processes and how the government plans to persuade the private sector to work for the fund contribute to negative perceptions. It will not be easy to convince private-sector doctors to work more for less pay. This also accords with Matthew and Mash (2019), who reported that many private-sector physicians were less inclined to join the scheme due to the prospect of higher workloads with reduced quality of care and remuneration.

Further, the government is perceived to be antagonistic to the private sector, as seen from the scapegoating of the latter for the many healthcare system ills, such as the unsustainable pricing of services. Matthew and Mash (2019) reported a similar finding which they noted as contributory to the negative sentiment towards the NHI. The private sector is also reluctant to work with the government because the government has failed to engage the private sector. Consequently, opportunities for cooperation through public-private partnerships are constricted, made worse by the fact that they require buy-in from a wide variety of people who are not used to working together. Therefore, reluctance to work together due to the lack of trust between the government and the private sector complicates the entire process.

The perception of being excluded in NHI design is also shared by key constituencies, even those from the public sector. Community health workers — considered the backbone of the primary healthcare and foundation of the NHI — have not been given the needed platform to contribute to policy. This is consistent with Murphy and Moosa (2021), who reported on the district health managers' view that they lacked clarity on the scheme's implementation strategies due to a lack of opportunities for engagement in policy formulation. There is some expectation that the scheme will exacerbate some healthcare ills due to poorly designed policies. These could include the overprovision and under-provision of healthcare in some areas and poor competitiveness, which may lead to soaring prices and poor service quality.

Table 5. 1 Policy issues as stakeholders' sentiment drivers

1.	Inadequate and complex accreditation processes for private providers
2.	Lack of market for demand assessment will lead to over- and under-provision of services
3.	Poor engagement of key constituents in policy design and consultation
4.	The government's mistrust of the private sector constrains the scope of a partnership
5.	Rife complexities in marrying the private and private systems
6.	Challenging to convince the private sector to work more for less pay
7.	Lack of competitiveness, leading to unaffordable prices and inferior quality of care

Source: Author's compilation (2021)

Taken together, these findings indicate a general lack of trust and confidence in the government's ability to enact apt policies. This needs to be resolved by the government itself before introducing the scheme. Its success is highly dependent on it. Some stakeholders feel that the scheme confers too much authority over to the government as a publicly run entity. This puts the healthcare system at the mercy of what they view as an incapable government. If stakeholders see the government as incapable of handling such a vital scheme, they may oppose it. The government should also consider improving policy communication with the relevant stakeholders. Much of the push against the scheme may result from poor communication by the government and, consequently, low awareness among stakeholders.

(b) Funding issues as stakeholder's sentiment drivers

As in the case of policy issues, some funding issues were identified, as reported in Table 5.2 below. One such issue relates to the rising and ageing population. These trends mean that resources will start spreading thin at some point. The concerns relating to sufficiency were also reported in studies by Matsi (2015) and Passchier (2017). This is especially concerning for most stakeholders because, in addition to the unfavourable demographic dynamics, there is concern that a corrupt and incompetent government is controlling the system. The current pandemic has exposed the government's lack of capacity and integrity to manage finances, further eroding all the trust that various stakeholders had in the system. This is consistent with the findings by Molokomme *et al*. (2018) relating to the concerns about the mismanagement of funds and irregular expenditure by the government and its officials.

The obscurity of funding sources has been translated as the government's refusal to deal with the possible unaffordability of the NHI. It is still pushing on with implementing the scheme despite knowing it is unaffordable. This may explain the unrealistic expenditure projections, which could lead to catastrophic spending decisions. This concern is consistent with Passchier's (2017) concern about government projections and Omarjee's (2018) assertion that the scheme lacks a fiscal rule that links spending to the available resources, which means that expenditure may spike once the scheme is introduced. Further, there is an expectation of poor ring-fencing of funds earmarked for the scheme. With no assurance that the revenues raised from scheme taxes will be used for the scheme's purposes, there is no guarantee that the government will honour its commitment to the scheme.

Poor economic growth in the country is also expected to affect the scheme's sustainability. Currently, the South African economy is performing below the growth rate assumed in the revenue projections and has a negative outlook (Rolland *et al*., 2021). This is worsened by the country's very narrow tax base. It is thought that a sharp decline in high-income taxpayers over the recent years has significantly reduced the tax buoyancy and ability to raise enough funds for the scheme reforms. This is in line with Ataguba and McIntyre (2018), who noted that most financing sources, such as indirect taxes, are either regressive or insufficiently broad to finance the NHI. Further, the significant budget shortfall that will come with the scheme's introduction will be hard to fill as the country cannot afford more debt to fund this deficit. The country is already significantly indebted, a debt that increased sharply due to the pandemic.

Table 5. 2 Funding issues as stakeholder's sentiment drivers

1. A rising and ageing population and other demographics will constrain resources
2. Reluctance to deal with affordability issues and unrealistic costing in the scheme
3. Poor ring-fencing of finances will lead to the diversion of funds for other purposes
4. Economic growth that determines the fiscal purse has been poor
5. The government lacks the capacity and integrity to manage finances
6. The narrow tax base has reduced buoyancy and the ability to raise funds
7. The high indebtedness of the country limits its borrowing capacity

Source: Author's own compilation (2021).

Overall, the government seems determined to reform healthcare through the NHI. While there are other prominent issues to consider, ensuring funding efficiency is at the core of the NHI. This could be achieved by considering other funding sources, such as new taxes and the diversion of funds from other uses in the budgets to cover the expanded services provision. Alternatively, some of the proposed reforms could be scaled down only to bring affordable reform. The government also needs to weed out corruption and mismanagement of funds. This is because, in addition to the general insufficiency of financial resources, the lack of capacity and integrity to manage finances continues to concern the various stakeholders. The government's record in healthcare and other sectors does not inspire strong confidence.

(c) Regulatory issues as stakeholders' sentiment drivers

Any new policies require the backing of the constitution. In Table 5.3 below, the subthemes concerning regulations are reported. One of the issues raised was that the unconstitutionality and illegality of some of the regulations that are necessary for the scheme to be built and rolled out nationally open it up for legal challenges and significant delays. This is especially so for the distinct phases of the scheme's development. It could explain why the government drastically rushed to gazette the NHI bill. Further, the scheme introduces a range of untested structures and regulations into law. This has been done without any transitional provisions to allow for learning; most of the ones introduced have no way to turn back if they fail. Added to the unconstitutionality of some aspects, it is clear why different stakeholders would be concerned about these untested structures.

There is also the perception that the government has unconstitutionally limited the choice for private healthcare providers by constraining them to either be employed by the NHI itself versus compulsory contracts with the state in which the latter determines tariffs, workplace, diagnostics, medication and treatment. The state is seen as intending to control every action of the private providers beyond its normal scope using newly created regulations. Further, the government's proposed rechanneling of private medical schemes' assets and reserves is perceived as unethical, illegal, and unconstitutional. As private entities, the assets and reserves owned by the medical aid schemes belong to the subscribers of those schemes. This is another aspect that may face a significant challenge in the courts of law.

There is also the perceived lack of adequate regulations to control the private sector and assist in the transition to the NHI. The government is perceived as failing to create regulations ensuring less legal opposition and challenges. This is the stakeholders' perception that supports the scheme's introduction. The private healthcare sector has become inefficient, uncompetitive, and marred by rising costs. This required apt regulation to control expenditure drivers before the NHI implementation to avoid the scheme's immediate failure and a waste of resources. Overall, the view is that of a lack of intentionality and clarity regarding the scheme's regulations. The legal minefield covering the current processes and the mistrust between the government and the private sector add a layer to the regulatory concerns.

Table 5. 3 Regulatory issues as stakeholders' sentiment drivers

1.	Unconstitutionality of some regulations in distinct phases of implementation
2.	Introduction of untested structures into law without transition provisions
3.	Lack of adequate regulations to control the private sector and transition to the scheme
4.	The limitation of choice for providers and the control of every aspect of care by the state
5.	Rechanneling assets and nationalizing the reserves of private medical schemes
6.	Poor regulation to control various expenditure drivers in the system
7.	Lack of clarity and intentionality in the regulations

Source: Author's own compilation (2021).

Looking at all these concerns raised, it is clear that the government needs to carefully consider the constitutionality and sufficiency of regulation to protect the scheme. Unconstitutional regulations may expose the scheme to delays due to legal contestations in the courts of law, mainly by the private sector and any other special interest groups. On the other hand, insufficient regulations may weaken the sustainability of the operations of the scheme, especially so if the government fails to control the actions of private actors in the healthcare system that are to the detriment of the scheme. Per Gray and Vawda (2019), the radically transforming healthcare terrain demands a high degree of policy coherence and visionary stewardship from the government in a participatory and inclusive national effort. This would ensure sufficient and constitutionally sound regulation to protect the scheme.

(d) Systemic challenges as stakeholder's sentiment drivers

The healthcare system and challenges therein have also been noted as a cause for concern for the NHI. There seems to be a consensus that the resources the NHI consume on a decrepit foundation far outweigh what is needed to fix the system itself. In Table 5.4 below, one issue relating to the current system is the maldistribution of resources between the public and private sectors. If not addressed, there is a strong possibility that inequities may be exacerbated. This is consistent with Bateman (2010), who reported a strong concern regarding the current healthcare system upon which the NHI would depend. Further, the prospect of being forced as the whole country to depend on the state has sparked concern. It could be more beneficial for the government to reform the current public health system first.

The inadequacy of the scheme as a mechanism to address the fundamental issues may be worsened by its failure to acknowledge the healthcare system's dysfunction fully. Failure to appreciate the size and significance of the problems in the healthcare system means that whatever measures are put in place would be inadequate. The likely result would be the wastage of scarce resources at best as the scheme fails to achieve its goals. For instance, some stakeholders believe that there is no working system that unifies both the public and private healthcare systems defined in the scheme. However, the division between these two sectors is identified as the cause of the many problems and should be addressed. Some of those problems include the unsustainable pricing propagated by the private sector.

Many stakeholders contend that the government should focus on upgrading the public health sector. There is poor infrastructure and equipment therein. Various public healthcare facilities at both district and provincial levels are not ready to implement the scheme. They lack personnel and infrastructure due to underinvestment in maintaining critical infrastructure and resources. With such an undermined healthcare system, there is simply no strong enough foundation to introduce the scheme. It is thus unsurprising that the perceived lack of commitment on the part of the government to build the public system before the scheme's introduction in favour of going ahead with the scheme has enraged some stakeholders who cannot see how the scheme will succeed.

Table 5. 4 Systemic challenges as stakeholder sentiment drivers

1.	Inadequacy of the mechanism to address private-public sector financial imbalances
2.	Failure of the scheme to acknowledge the level of dysfunction in the healthcare system
3.	The possibility of worsening the private-public sector maldistribution of resources
4.	The current system lacks sufficient personnel, infrastructure and resources required for the scheme
5.	Introducing the scheme on a decrepit foundation will consume more resources than fixing the system
6.	The government lacks the commitment to build the public system before the scheme's introduction
7.	Absence of a working system to unify the public and private healthcare sectors

Source: Author's own compilation (2021).

Many studies continue to advocate for effective priority setting in South Africa as it is a country beset with the challenge of constrained resources (Hofman *et al*., 2015; Weale *et al*., 2016; Li *et al*., 2016; Tugendhaft *et al*., 2020; Solanki *et al*., 2021). Regarding the NHI, the government must ensure that the scheme has the best possible chance of succeeding. That includes the prioritisation of fixing the healthcare system. Maphumulo and Bhengu (2019) describe the healthcare system in South Africa as ruined and in serious need of repair. The government should only consider introducing some of the reforms contained in the scheme after repairing the system. Further, the government should allow more time to address systemic challenges before implementing the scheme. This is because the healthcare system is too complex to fix quickly.

(e) The scheme's private sector impact as stakeholders' sentiment driver

The status quo will undoubtedly change when the NHI is implemented, and the private sector will likely be the most affected. Table 5.5 contains the issues relating to the impact. The first relates to the perceived unjust pressure the government is exerting on the private sector. This is in line with Matthew and Mash's (2019) finding that the private sector perceives the government as antagonistic to them. Thus, in its bid to control how the sector operates, the government has been seen as taking unjustifiable measures mainly in the form of prescriptive regulations that infringe on their rights as they will not be able to decide for themselves how they want to operate. So, they are perceived as unconstitutional, making challenges in the courts of law inevitable. This is consistent with Surender *et al*.'s (2015) finding that the government would face significant opposition and legal challenges from the private sector.

Many stakeholders deem private sector reforms necessary for the NHI to stand a chance in South Africa. Even though they do not put all the blame for the dysfunction in the healthcare system on the private sector, they recognise its complicity. However, there is a view that some of the proposed reforms could reduce some private sector capacity. This could seriously compromise the healthcare system (Surender *et al*., 2016; Hannah, 2017). Considering that the private healthcare sector has been at the forefront of public health concerns such as the current pandemic, such developments are likely to be seen negatively. Further, the effects of such disturbances in private healthcare capacity are expected to spill to the whole healthcare system and the economy.

The same applies to the limit being placed on private medical aid schemes. There is a strong and growing view that it is counterproductive to the NHI as the scheme's major threat is the lack of sufficient funds. The government's goal is to ensure that medical aid schemes will eventually only provide top-up coverage. However, limiting private medical schemes will drain the resources that must be used for people in most need and add to the strain on the resources. This is in addition to the shift of people from the private sector to the public sector as some medical aid for complementary services becomes very unaffordable. These findings could explain why Booysen and Hongoro (2018) found that private healthcare sector users with private medical insurance were more pessimistic about the scheme than public healthcare sector users without medical aid.

Table 5. 5 The scheme's private sector impact as stakeholders' sentiment driver

1.	Unconstitutional regulations that infringe on the right of private practitioners
2.	Regulations will make private health unaffordable, causing a significant sector shift
3.	Overexertion of unjust pressure on the private sector by the government
4.	The necessary reforms for the scheme may destroy some existing private sector capacity
5.	Medical aid schemes are allowed only to provide supplementary cover
6.	Restrictions on private healthcare and medical schemes will impact the economy at large
7.	Limiting medical schemes reduces the resources available for those in need

Source: Author's own compilation (2021).

There seems to be a consensus that the government's attitude to the private sector is antagonistic, leading to low from the private sector. However, this sector is crucial to the NHI's success. The importance of public-private partnerships cannot be overemphasized. Therefore, how the government engages with the private sector will determine the success or failure of the scheme. South Africa is fortunate in having notably high-quality healthcare resources in the private sector – primarily financial and personnel (Heunis *et al*., 2019). Therefore, these resources must be deployed appropriately to accomplish the ambitious objectives of the NHI in a timely and comprehensive manner (Ramjee *et al*., 2013). The government needs to properly engage and incentivise the private sector to improve the scheme's chances of success.

(f) Governance issues as stakeholders' sentiment drivers

Concerns relating to governance have also been raised. Table 5.6 below contains some of the issues raised as far as healthcare system governance is concerned. One of the most significant concerns relates to the placement of total administrative authority over funds in the hands of the state. The state is perceived as possessing poor financial management controls, a legacy of looting and corruption, a disregard for supply chain management legislation, an inability to manage projects effectively, and a lack of accountability in its different sectors. Various state-owned companies' failures have been cited as examples of this observation. What most stakeholders note as even more concerning is that the NHI will be significantly more extensive and complex and, therefore hard to manage than all the parastatals that have already failed or have become huge black holes for taxpayers' money through bailouts.

Thus, the lack of government managerial capacity and its legacy of mismanagement of institutions is an issue of concern. This is worsened by the territorial tensions between provincial health governments and the state due to the increased centralization of some health functions. Provincial health departments have a constitutional role in organising healthcare services at their local level. However, this constitutional role is perceived to be at odds with the increasing centralisation of primary healthcare functions that will come with the NHI. The centralisation may also foster poor cooperation from the private sector. Further, the seemingly hurried NHI implementation could result in excessive administrative red tape. Legal challenges may also ensue, leading to an erosion of very scarce resources and costly delays in the scheme's implementation while people are paying for healthcare they are not receiving.

There is also the issue of governance structures. There is a consensus that the foundational structures of the scheme incorporate groups with strong vested interests in how the scheme will run. The special interest groups may use their positions to protect their privilege in a structure that leaves broad scope for extracting patronage. This would be at the expense of the egalitarian objectives of the scheme. There is also a concern regarding the governing structures' political composition. Vital healthcare stakeholders feel they have been excluded from the governing structures, while those with vested interests are given the power to shape the process. The structures seem to have been developed to win over constituencies whose opposition to the scheme would otherwise be substantial. By eliminating this opposition, there is instead creation of a conflict of interest between operations and accountability.

Table 5. 6 Governance issues as stakeholders' sentiment drivers

1.	The placement of a significant amount of funds in the hands of a state with poor management history
2.	The complexity of the scheme for a government with poor managerial and administrative capacity
3.	The inclusion of groups with strong vested interests and privilege in foundational structures
4.	The political orientation of governing structures causes a conflict of interest and poor accountability
5.	Exclusion of some health workers, communities, and civil society in administrative structures
6.	Tension between provincial governments and the state due to the centralization of health functions
7.	Premature implementation amounts to significant red tape and inefficiencies in the healthcare system

Source: Author's own compilation (2021).

In this regard, the government must ensure that the structures it will set up will be able to ensure relevant policy imperatives are implemented in its bid to reform healthcare (Marais and Petersen, 2015). There is also a need for all the sub-policies in the NHI to have an approach that will strengthen cooperative governance across all spheres of government and relationships between the private and public sectors (Brauns, 2016). However, the first step is to have an open discussion about the nature of leadership required within the South African health system and sustained engagement about how to develop leadership across the system. After such considerations, systematic processes required to improve the competencies of leadership and governance for better healthcare system delivery can then be implemented.

(g) The rationale of the scheme and stakeholders' sentiments

In the introductory part of this chapter, it was asserted that the scheme's rationale and technical aspects might invoke different sentiments. In Table 5.7 below, the issues relating to the rationale are reported. The scheme is perceived to be good for the nation and social justice. Some stakeholders see it as fundamentally about the redistribution of wealth in a society with one of the highest rates of inequality in the world. Its recognition of socioeconomic injustices, imbalances and inequalities of the past and proposed path to a society based on democratic values, social justice and human rights is welcome. The significant inequities in the healthcare system have garnered more support for the scheme. Most stakeholders believe that creating a single pool of funding will transform the system into a people-centred, human rights-based and community-led one.

However, some view the scheme as structured in a way that goes against its principles and rationale. This is especially so with the issue of choice, particularly the lack thereof for the private sector. There is a perception that the scheme will introduce coercive healthcare controls while robbing individuals of choice in many aspects of their care. The scheme has faced much opposition from critics who object to the state prescribing the health institutions people will have to use to access healthcare services. There is also a chance that the inequalities could widen even further as the NHI is seen as lacking strong enough mechanisms to ensure equity and fairness. This is the greatest fear of many stakeholders – ending with a worse healthcare system than what already exists. So, while the rationale for introducing the scheme is noble, the real nobility is in delivering what has been promised.

The absence of platforms for meaningful public participation is seen as taking away from the people-centredness and community-led service delivery approach proposed as one of the founding principles of the NHI. The private sector also views the scheme as a socialist assault on their independence, which underpins all South Africans' liberties. It will give the state a monopoly over healthcare, further shackle the economy and significantly expand the power of that same small group of actors. The scheme is seen as a tool that will be used to advance a destructive socialist revolution and pursue the blatant elite enrichment under the control of the state. This is especially so because it lacks the requisite structural mechanisms of redistribution vital to ensure that the country moves beyond the ideals of transformation towards a society that does benefit everyone who lives in it.

Table 5. 7 The rationale of the scheme as stakeholders' sentiment driver

Positive	Negative
The scheme is fundamentally about the redistribution of wealth in a society with one of the highest rates of inequality in the world	The coercive healthcare controls are counter-equity and equality and will rob individuals of choice and widen inequity and inequality.
The scheme identifies socioeconomic injustices and seeks to redress inequalities that are borne out of historical and current social injustice	The absence of platforms for meaningful public participation in health reforms means that the final version of the scheme will not be people-centred
The number of people dependent on the poorly-financed public healthcare sector far outweighs those in the well-funded private sector	The scheme represents a socialist assault on the independent private sector that underpins South Africa's liberties to give the state a monopoly over healthcare
The creation of a funding pool in a people-centred, human rights-based and community-led service delivery model can build social solidarity	The scheme lacks the requisite structural mechanisms of redistribution vital to ensure a move beyond the ideals of transformation

Source: Author's own compilation (2021).

This discussion indicates that rationale alone cannot ensure enough support for the NHI. This could explain why some stakeholders keep pointing toward the conflict between some of the principles and some of the technical aspects of the scheme. The government needs to make sure that there are practical mechanisms that back those principles. Many stakeholders already view the scheme as a political move disguised as a reform that is not really in the country's best interest (Madore *et al*., 2015; Pauw, 2021). The onus is upon the government to convince these stakeholders that the scheme is meant to reform healthcare provision in the country and not serve political interests. While this is easier said than done, improving policy communication and availing finer details to the most critical aspects of the scheme may go a long way in convincing stakeholders.

(h) **The covid-19 pandemic and stakeholders' sentiment**

As alluded to above, there was an examination of the impact of the covid-19 pandemic on stakeholders' sentiments towards the NHI. Table 5.8 below reports some of the issues identified in this regard. First, the pandemic is seen to have enhanced collaboration between public and private sectors and the vaccine rollout is perceived to have fostered government-business partnerships, both of which are necessary for the scheme to work. Covid-19 exposed the significant inadequacies in the healthcare system that require significant reform as envisaged in the scheme and highlighted interconnectedness across socio-economic classes. It also allowed for testing some mechanisms of the NHI, such as payment systems. Finally, the performance of countries with one national system, similar to the proposed scheme in South Africa, highlighted why South Africa needs the scheme

On the other hand, the way the pandemic was managed may have fortified some of the negative stakeholder sentiments. There is a strong perception of a lack of agility in response to the pandemic, indicative of the absence of government leadership, core competencies and managerial capacity. The pandemic may also have exposed the vulnerability of the healthcare system to corruption, looting and wastage of funds, as well as the ills, complexities and bureaucratic inefficiencies of centralized healthcare. The overly controlling and firm hand of the government on the private sector may also have highlighted the scheme's threat to the latter and how that increases and magnifies the vulnerabilities in the healthcare system. The lack of civil society participation in decision-making worsened, and the perceived willingness of the state to exploit the anxiety and hardship caused by the pandemic

The pandemic was an opportunity for the government to garner support by highlighting a need for reform that the NHI could fulfil. This could have been achieved by ensuring transparent handling of covid-19 relief funds, especially as there was much interest regarding how the government would spend the funds they were securing. This was like a prelude to the additional funds the government would secure through various means for the NHI. However, stakeholders were highly disappointed by allegations and reports of misappropriation and poor management of resources secured to champion the response against the pandemic. The government could also have ensured that the vaccine rollout was impeccable, highlighting its ability to secure and equitably distribute scarce resources. However, a considerable percentage of the population remains unvaccinated.

Table 5. 8 The covid-19 pandemic and stakeholders' sentiment

Positive	Negative
Collaboration between public and private sectors improved significantly, and so did the government-business partnerships	Lack of agility and expedited response indicative of the absence of good leadership and managerial capacity of the government
The exposed inadequacies in the healthcare system and the highlighted interconnectedness across socio-economic classes fortified the necessity of reform	The pandemic and how it was overseen exposed the vulnerability of the healthcare system to corruption, looting and wastage of funds
The pandemic provided an opportunity to assess some of the provisions and mechanisms of the NHI	Covid-19 exposed the ills, complexities and bureaucracy of centralized care, vulnerabilities in the system and the threat to the private healthcare system
The performance of countries with systems similar to the NHI highlighted why South Africa needs the scheme	The lack of civil society participation in decision-making was worsened by the state's willingness to exploit the anxiety and hardship of covid-19

Source: Author's own compilation (2021).

The pandemic also presented the government with the opportunity to build on the goodwill and cooperation from the private sector and businesses and to engage the public and civil society in the healthcare decision-making processes. However, the government has failed in both endeavours. Therefore, despite some positive sentiment drivers, the pandemic represents a missed opportunity for the government to improve stakeholder sentiment towards the scheme. How the government oversees the vaccine rollout and manages the pandemic from now on, with signs of having learnt from the many mistakes in managing the pandemic, will determine the total cost of that missed opportunity. Also, the covid-19 pandemic is far from over. The subsequent variants have prolonged the government's opportunity to show off its ability to run and manage a pandemic, which can be translated into running an NHI.

As mentioned above, the advocacy coalition framework fits policy areas characterised by high-goal conflict (Hoppe and Peterse, 1993). The analysis shows ample evidence of significant goal conflict, especially between the government and the private sector. The framework is also applicable to policies with high technical uncertainty (Hoppe and Peterse, 1993). That was also apparent in the articles examined. The proposed scheme and the structures and policies required to be set up for it to succeed, and the failure of the government to provide the finer details on how the scheme will operate all seem to point out the high technical uncertainty of the NHI.

Thus, the concerns raised regarding the scheme in the articles mainly related to the technical issues and less so the rationale and principles of the scheme

However, it was apparent from the analysis of the themes that there are very few existing coalitions, which represents a departure from the advocacy coalition framework predictions. However, the framework was still applicable as most stakeholders have been banding together and voicing their concerns against the NHI in concert in a manner that mimics coalitions. Further, there was a departure from the enormous number of actors from multiple levels of government, as suggested by Hoppe and Peterse (1993). The stakeholders come from the government, the public healthcare sector and, more overwhelmingly, the private sector. However, these groups satisfied the definition of coalitions based on their active involvement in seeking solutions to the healthcare policy problem, fundamentally driven by their beliefs which they desire to see reflected in policy.

5.5 Chapter summary and conclusions on stakeholder sentiments

Building from the previous analytical chapters on systemic threats to the NHI and its affordability, this chapter assessed stakeholders' sentiments towards the NHI. This analysis was based on the recognition of the importance that stakeholder sentiments and perceptions have on the success or failure of any reforms or policies, especially public ones. Given the South African context, stakeholders’ perceptions were considered particularly important. The amount of resources needed to be pumped into the South African healthcare system through the NHI is enormous. Thus, the country cannot afford any waste from failed policies and reform. The South African healthcare system can also not afford any failure of the scheme because that could leave it worse than it already is. In this section, the objectives and findings are reviewed.

5.5.1 Review of objectives

Three groups were identified – taxpayers, healthcare providers and beneficiaries – to determine whether their sentiments were negative enough to threaten the successful implementation of South Africa’s impending NHI. Further, the impact of the current covid-19 pandemic on stakeholders' perceptions was also examined based on the assertion that how the pandemic was managed could have highlighted the issues likely to be encountered when the NHI is implemented fully. Finally, the most noted issues that could drive or explain stakeholders’ sentiments were examined. As an ex-ante evaluation, these sentiment drivers were considered essential for the policymakers in their quest to ensure support from stakeholders. Remedial action becomes easier to take if the drivers of the observed sentiments are determined.

News articles were employed as the source of data. This is because, while they reflect sentiments, news articles also help shape the sentiments of readers. Further, employing news articles allowed the study to access a wide range of stakeholder sentiments towards the NHI and examine and track changes in stakeholder sentiments over time. The identification of key stakeholders and informants by publishers also influenced the decision to use news articles as the source of information. Using the chosen articles, document and sentence sentiment analysis was conducted to examine the sentiment portrayed by these articles. The Stanford CoreNLP, a Java-based annotation pipeline framework, was employed based on its attributes in core natural language processing.

5.5.2 Review of findings

In examining sentiment at the article level, most news articles fell into the neutral sentiment category, possibly due to dilution between sentences of negative and positive polarity scores. There are some aspects of the NHI that some stakeholders have accepted and others to which they are opposed. Having both these aspects within one article meant that dilution was inevitable. This observation highlighted a limitation of aggregation when analysing sentiments. However, articles were more likely to have negative sentiment polarity than positive sentiment polarity. In terms of magnitude, the negative polarity scores were also generally more robust than the positive ones. This suggested that there were a lot of concerned stakeholders regarding the NHI, especially regarding the technical aspects of the scheme.

At the constituent sentence level, a significant portion fell into the negative sentiment category. Further, the magnitude of the negative polarity scores was much higher than that of the sentences with positive polarities. These results suggest that the negative sentiment towards the NHI could threaten its success. Further, the magnitude of the positive and negative sentiment polarity scores in sentences could be explained by the possibility of having two distinct sources of sentiment – aspects relating to the rationale and aspects relating to the technical aspects of the scheme. A similar pattern was observed in sentences that referred to the covid-19 pandemic, suggesting that how the pandemic was handled may have worsened sentiment towards the NHI. Polarity scores of articles' sentences over time also confirmed the skewed distribution of polarity scores, with only slight changes over time.

After examining news articles' polarities, the drivers of the sentiment towards the NHI were investigated. A total of six themes were identified. These include policy issues, funding issues, regulatory issues, issues relating to various systemic challenges, the impact on the private sector and governance issues. The subthemes under each of these themes were primarily on the technical aspects of the NHI. This indicated that most stakeholders were not worried about the rationale and principles of the scheme but about how it would operate technically. In addition, some issues relating to the rationale behind the scheme and those relating to the covid-19 pandemic were grouped as two additional themes. There were both positive and negative drivers of sentiment under each of the themes.

5.5.3 Conclusion

Considering the importance of the issues shaping stakeholder sentiments towards the NHI, their number should be of great concern to the government. In its bid to successfully roll out the NHI, the government needs to consider the possibility that the scheme is under significant threat due to the significantly negative sentiment of stakeholders. However, there is a positive aspect: identifying a problem is always the first step in solving that problem. By expressing their concerns to the government, stakeholders may be helping the same government in identifying critical issues that threaten the NHI. Based on the concerns raised, the government needs to focus on the technical aspects of the scheme more than the rationale. Most of the stakeholders agree that there is a need for reform. The problem is fundamentally on the kind of reform in terms of its form that has been proposed.

There is also an indication of poor communication on the part of the government, which has cultivated many uncertainties. The government can address this issue by providing more operational details on the NHI. It can also aim to improve the engagement of stakeholders. The government needs to make sure the different stakeholders that have roles to play in implementing the scheme are aware of those roles. The same stakeholders – taxpayers, beneficiaries and providers – need to raise their concerns more vehemently. They are raising good points, and as important stakeholders, they need to make sure that the government listens to and considers their concerns. The government seem to be determined to implement the scheme at all costs despite the significant opposition levelled against it. Coalitions may be beneficial in making sure that the government listens to and considers their concerns.

CHAPTER 6: CONCLUSION ON THE PRE-IMPLEMENTATION EVALUATION OF THE NATIONAL HEALTH INSURANCE SCHEME

6.1 Introduction

The importance of a well-functioning healthcare system, the significance of equity and the attainment of universal health coverage cannot be overstated. This is why any proposed reforms in a healthcare system such as the South African NHI receive significant attention and scrutiny. The state of affairs has further heightened the attention on the healthcare system – precisely the gross inequities that reveal a confluence of apartheid policy legacies, lack of political will towards improving the healthcare system and poor stewardship of the current healthcare system (Mayosi and Benatar, 2014). The scheme has been dubbed an answer to the many ills faced by South Africans in the healthcare system. Optimising the sourcing of revenues, the pooling of funds and purchasing services through the scheme is expected to propel the country towards universal health coverage.

However, any reform as enormous as the NHI needs to be meticulously designed and implemented for several reasons. Firstly, significant alterations in the healthcare system must be made to pave the way for such a scheme, most of which are irreversible or costly to reverse. Secondly, the failure of implemented reforms can worsen some of the challenges in the healthcare system. Thirdly, the scheme's scale means a substantial quantity of resources will be consumed. However, failure would mean significant wastage of resources which are very scarce in South Africa judging by the inadequacies in the healthcare system. Herein, three aspects relating to whether the implementation and operation of the NHI in South Africa would be successful and sustainable were examined.

In the first analytical chapter, an attempt was made to determine whether there were any valid systemic threats to the NHI and whether the provisions to deal with the threats were sufficient. In the second analytical chapter, which took a structure of a case study of the covid-19 pandemic and how it was overseen in South Africa, the objective was to examine further the significance of the threats to the NHI identified in the preceding chapter. The third analytical chapter focused on the scheme's affordability by comparing projected costs that will be incurred to provide healthcare free of charge at the point of service and the revenues to be raised to fund those services. In the fourth analytical chapter, finally, the aim was to determine the extent to which stakeholder sentiments towards the rationale of the scheme and the operational aspects of the same are a threat to its successful implementation.

As alluded to above, the study was structured as long, separate chapters that departed from different theoretical frameworks and employed different methodologies and approaches. For instance, a systematic review of the literature was employed as the method in Chapter 2 and Chapter 3 and Kutzin's (2008) three-pillar framework as the theoretical framework. A simple non-parametric comparative analysis of projected revenues and healthcare expenditure costs and the more complex Monte Carlo simulation approach were used to determine the scheme's affordability in Chapter 4 based on the complex adaptive framework. In Chapter 5, the Stanford Core Natural Language Processing toolkit was used to examine the healthcare stakeholders' sentiment towards NHI, with the chapter departing from the advocacy coalition theory as the theoretical framework.

6.2 Summary of key findings and achievement of study objectives

This study's objectives were based on the overarching research aims for each chapter. This section summarises the key findings from the pre-implementation evaluation of the scheme in terms of systemic threats, the case of the covid-19 pandemic, financial affordability and stakeholder sentiments. Further, a description of how the objectives were achieved is also contained here in this section.

6.2.1 The systemic threats to the South African NHI

In examining systemic threats to the South African NHI in Chapter 2, insufficient administrative capacity was found to be a significant threat to the NHI, especially so due to the size of the scheme and the level of competency required in its administration. Similarly, the lack and inequitable distribution of resources and infrastructure across provinces were also found to be significant threats to the scheme. If left unaddressed, there will be significant variability in the capacity to implement the scheme, which, in turn, could entrench cross-provincial and cross-district inequities. The two-tier system set up in financing healthcare was also noted as a threat in that as long as a parallel to the public tier exists, costs will remain challenging to control, and inequities will worsen, especially if there is an overreliance on the private sector providers. The next step was to examine the provisions made in the scheme to deal with these threats.

Firstly, new administrative and governance structures and supporting operational systems with clearly-stated functions, roles, responsibilities and accountability mechanisms will be set up to run the fund. Central hospitals will become semi-autonomous, with prioritization of the complete decentralisation of their management functions and responsibilities and district health management offices for the management, planning and coordination of district health services. Secondly, having a single funding pool will help support the mobilisation of resources and infrastructure and the strategic procuring of health resources. Prioritising registration and identification of beneficiaries at the point of use would also help deal with resource maldistribution. Lastly, regarding the two-tier setup, the government intends to create a unified health system by reducing fragmentation in funding pools.

From the evaluation of administrative provisions, positive aspects noted include provincial hospital semi-autonomy and the establishment of district management offices, both of which can counter some of the effects of centralised healthcare funding as they facilitate province and district-specific decision-making. However, having a single fund may be a source of inefficiency, poor accountability and corruption. There are also diseconomies of scale, as highlighted in most parastatals. Some of the provisions for the resources and infrastructure may lead to more equitable distribution of resources. Nevertheless, having one purchaser may be inefficient. Regarding the two-tier setup, the positive aspects include the removal of financing fragmentation and the improvement in risk pooling. However, the negative aspects include opposition from private providers and reduced capacity in the private sector.

Overall, in this chapter, the first objective of identifying the systemic threats to the NHI was satisfied as poor government administrative capacity, lack of and poor distribution of resources and infrastructure and the two-tier healthcare setup were noted as valid threats to its successful implementation. The second objective of examining the provisions made to deal with the identified threats to the health scheme was achieved by examining the provisions that referred to the identified systemic threats in the white paper (2017) on the NHI. The third objective of the sufficiency of the provisions was achieved by interrogating the provisions made in the scheme documentation in light of the identified threats. This was done while referring to international literature that documents how other countries have dealt with similar threats to their respective schemes and the extent to which they have been successful.

6.2.2 South African NHI systematic threats and the covid-19 pandemic

From the early months of 2020 to date, all healthcare systems have faced enormous pressure from the covid-19 pandemic, especially the weaker systems. For South Africa, various healthcare inadequacies have made the manageability of the pandemic much more arduous and expensive. This has sparked an argument in which one group argues that the pandemic could have been managed better had the proposed NHI been in place already. Another group, however, argues that had the NHI been in place when the covid-19 pandemic came to South Africa, the healthcare system would have performed much worse. This chapter sought to examine this argument, focusing on the inadequacies in the healthcare system relating to the government's administrative capacity, resources and infrastructure availability and distribution and the two-tier system.

From examining the additional burden on the system from covid-19 and the proposed reforms in the healthcare scheme, it seems likely that having a well-functioning NHI could have helped handle the pandemic. There would have been enough well-trained healthcare personnel to deal with covid-19 cases. More healthcare facilities would have been up to standard and adequately equipped to manage the covid-19 cases. There also would have been proper pharmaceutical infrastructure to cope with the increased demand for medicine and crucial information systems to ensure suitable information-based interventions. The funding could also have been in place, centrally administered via the scheme. Perhaps there would not have been a need for a hard lockdown and strong anti-transmission measures – which came at a steep cost to the economy – had the healthcare system been more prepared.

However, there are arguments that introducing the NHI on a derelict could have introduced some extensive inefficiencies. So, had the scheme been already in place, fighting the pandemic could have been much more challenging. The NHI may have buckled under the increased burden, throwing the whole system into chaos. Add to that, the scheme's possible unaffordability and the likely merging of the private and public sectors into one unit could have further impaired the healthcare system. It is possible that the scheme could have provided a false sense of security, and the anti-transmission measures taken to prevent the collapse of the healthcare system may not have been taken. So, there is a need to advocate for the scheme with caution and understanding that it can worsen the already significant challenges in the healthcare system if not implemented well.

Overall, the objective relating to whether the pandemic could have been managed better under the NHI was achieved by highlighting the inadequacies in the system that adversely affected the manageability of the pandemic, particularly those inadequacies that would have been addressed by having an NHI in existence. The second objective was achieved by looking at the effects of the burden on the healthcare system that came with the pandemic, as the scheme is likely to face that same pressure when services are provided for free at the point of service. Finally, the objective regarding the degree to which the covid-19 pandemic has increased the success of implementing the scheme was achieved by looking at any lessons learnt, any areas of improvement and any weaknesses in the scheme framework exposed by the pandemic.

6.2.3 The affordability of the South African NHI

Determining the affordability of the NHI entailed comparing projected costs and revenues based on certain assumptions and scenarios. This drew from the assertion that the NHI's cost of coverage will be prohibitively high, and South Africa cannot afford it. The current healthcare inadequacies in the system, the expected changes in healthcare-seeking behaviour and poor cost controls have been cited as reasons for the expected unaffordability. Further, there is an assertion that the government will not be able to raise enough revenue to fund the assemblage of reforms that the scheme represents. However, despite these concerns, the South African government looks set and determined to implement the NHI. They seem emboldened by the expectation that the scheme's affordability and sustainability may improve once it is fully implemented as efficiency gains set in.

In examining affordability, various assumptions were made on which to base the revenue and cost projections. These assumptions relate mainly to the calculation of the base costs of coverage, total revenues that may be raised to fund the scheme and their respective growth rates. Two approaches were employed – a non-parametric comparative analysis of revenues and costs and a Monte Carlo simulation analysis. In the non-parametric approach, a determination of whether it would be feasible to raise enough funding to support the new level of expenditure in the first year of the scheme's full implementation was conducted. On the other hand, simulations were run on costs, revenues and the differences between the two in the Monte Carlo approach to determine the scheme's affordability over a more protracted period. Scenario analyses based on costs and growth rate were also conducted.

The conclusion was that the NHI, as currently conceived, is unaffordable for South Africa. This is despite the strong need for reform in the country. The unaffordability stems from costs of coverage that are too high due to a comprehensive benefits package promised by the government and projected revenues that are too low due to the country's poor economic and tax performance. Unless the government ensures that efficiency gains set in quickly and stringently control the providers, the NHI will expose the whole healthcare system to significant risk. There are other ways through which the government can ensure that the scheme is affordable. Measures such as a staggered extension of coverage, the introduction of co-payments with patients, delayed introduction of cover for high-cost services and the reduction of the comprehensiveness of promised benefits packages can be key.

The overarching question of whether the NHI is affordable was answered by comparing its projected costs and revenues based on certain assumptions and scenarios. In this regard, the first objective was to project the healthcare coverage costs of the NHI under certain assumptions. This was achieved by estimating costs based on historical healthcare expenditure, government employees' medical scheme and low-cost medical schemes. The second objective focused on projecting the revenues under certain assumptions. This was achieved using total GDP, tax revenue totals as the source of revenue for governments and historical national budg*et* allocations to healthcare. The final objective focused on assessing the NHI's affordability by comparing the revenues and the costs under different scenarios. This was achieved using a comparative approach and Monte Carlo simulations.

6.2.4 Stakeholder sentiments towards the South African NHI

In Chapter 5, an attempt was made to determine the sentiments of taxpayers, providers and beneficiaries towards the NHI and the drivers of those sentiments. There is a possibility that the stakeholder sentiments may be significantly negative and threats to the successful implementation of the NHI, even if its fundamentals are in place. As an ex-ante evaluation, the results could help gauge the support the government should expect from these stakeholders. Further, this chapter explored the impact of the pandemic and how the government handled it on stakeholders' sentiments towards the NHI. It is conceivable that some stakeholders may have become more opposed to the NHI based on how the government performed. Nevertheless, exposing the healthcare system's inadequacies, the pandemic may have highlighted the need for reform through the scheme.

News articles were employed as a data source to include more than one stakeholder group in the analysis. Their use also allowed for the examination of sentiment over time. Sentiment analysis was carried out at both the aggregate article level and sentence level, with the latter aimed at overcoming the shortcomings of aggregation. The Stanford CoreNLP, a Java-based annotation pipeline, was used to determine the polarity and polarity scores of the articles and sentences. Further, a distinction between the sentiment towards the NHI's rationale and operational aspects was made based on the possibility that stakeholders may be supportive of the idea and justification of having an NHI but unsupportive of how the proposed scheme is structured in terms of its operational aspects. This enabled a more rounded examination of stakeholders' sentiments and their drivers.

From the results, most articles and sentences exhibited negative rather than positive sentiment polarity. The negative polarity scores were also generally more robust than positive ones. This suggests a strong possibility that the sentiment towards the NHI could be significantly negative to the extent that it threatens the scheme's success. As expected, there were differences between sentiments driven by the rationale of the scheme and those driven by the technical aspects of the scheme. A similar pattern was observed in sentences that referred to the covid-19 pandemic, suggesting that how the pandemic was handled may have worsened sentiment towards the NHI. Finally, six themes – policy issues, funding issues, regulatory issues, systemic challenges issues, governance issues and private-sector impact issues – were identified in examining the drivers behind the sentiment observed.

Overall, the objectives set out in this chapter were achieved. By examining the polarity of sentences in the articles selected for analysis, a distinction could be specified between those that made references to the rationale of implementing the NHI and those relating to the technical issues. The objective related to examining how the handling of the covid-19 pandemic impacted stakeholder sentiments towards the NHI was also achieved similarly. The polarity of sentences that referred to the pandemic was determined and analysed. Finally, themes and subthemes of issues raised in these articles were examined to determine the drivers of the sentiment polarities observed at the article and sentence level. The themes, as in the case of the polarities, were also grouped according to whether they related to the rationale of the scheme or the technical aspects thereof.

6.3 Implications of findings on systemic threats, affordability and sentiments

In the previous section, the key findings based on the research objectives and questions from the four analytical chapters above were noted. In this section, the policy implications of those key findings are detailed. These are important as the scheme is still in its infancy, and its various provisions can still be altered. Further, the NHI will alter the healthcare system's functioning significantly and carries with it the possibility of a healthcare catastrophe if it fails.

6.3.1 Implications based on the threats to the South African NHI

The findings from the review of systemic threats suggest that the scheme might collapse if implemented without first addressing the systemic inadequacies, thus confounding the healthcare system challenges. Regarding the inadequate administrative capacity, proper structures that promote accountability are installed at all healthcare system levels. The inadequacies of resources and infrastructure across districts mean that the NHI's success will also vary across the same jurisdictions. Positive discrimination, which takes more effort than just the decentralisation of systems, could be infused into policies to remedy this. Finally, while a robust private healthcare sector threatens the NHI, it can be leveraged in public-private partnerships. This would require transparency between government and private providers and equipping management with the skills to choose partnerships strategic to the NHI.

6.3.2 Implications based on the handling of the covid-19 pandemic

The covid-19 pandemic, as a case study on systemic threats, highlighted how significant they are to the NHI. The added pressure that came with the pandemic foreshadows the demand for healthcare services that the healthcare system will have to deal with once the scheme is fully implemented. Thus, it is pertinent that the government ensures that the healthcare system is ready to accommodate the scheme. Further, the government should consider gradually implementing the scheme based on the available financial resources to avoid sustainability challenges. The government should also create a role for the private sector in financing healthcare. Leveraging some of the strengths of private sector financing in the reformed healthcare system can help ensure that resources are available. Stricter control and proper management can ensure equitable performance between the public and private sectors.

6.3.3 Implications on the affordability of the South African NHI

There are significant policy considerations from the finding that the NHI may be grossly unaffordable. The government should consider scaling the proposed reforms to a reasonable level to avoid collapse. Primary healthcare reforms could be prioritised to bring affordable change to the healthcare system. Alternatively, less comprehensive benefits packages could be offered, or coverage could be extended over a more protracted period. This would allow the scheme to adjust without pressure on resources, allowing for progressive adaptation to population needs in line with an improvement in the NHI's capacity. A fiscal rule that limits expenditure to the available resources and a global budget may ensure that the NHI does not operate on an unsustainable and growing deficit. Co-payments can also be used to ration healthcare services usage, further improving the scheme's sustainability.

6.3.4 Implications of stakeholder sentiments on the South African NHI

The significantly negative stakeholder sentiments towards the NHI should concern the government as the scheme will likely face significant opposition. However, from the issues pointed out, the government can identify the drivers behind their sentiments. Based on the concerns raised, the government needs to focus on the technical aspects of the scheme more than its rationale. Most stakeholders agree that there is a need for reform, but not in the form proposed in the NHI. The government also needs to improve communication and engagement with stakeholders, particularly on the operational aspects of the scheme. This lack of engagement and low awareness drives most of the negative sentiment. This, together with clearly defining the roles that some stakeholders will play in the scheme, could help create more buy-in for the NHI.

6.4 Conclusion

The healthcare system in South Africa faces numerous challenges, including unaffordability, gross inequalities and inequities, and a rising quadruple burden of disease. These challenges persist despite the country spending more on healthcare than the recommended average. The need for reform is apparent, but there are concerns regarding the ability of the proposed NHI to facilitate such reform. This study found that the threats against the NHI are significantly valid, and the provisions set in the scheme to deal with these threats may have unintended consequences. Moreover, the study found that the NHI, as currently conceived, is unaffordable.

The government may fail to raise sufficient funds to cover the expected sharp increase in expenditure once the NHI is fully implemented. The scheme's unaffordability may also be contributed to by deficient administrative capacity that fails to control costs.

Finally, the study reported that stakeholder sentiments towards the NHI may be negative enough to threaten its success. Therefore, there is a need to address the concerns regarding the scheme's ability to deal with systemic threats, financial affordability, and stakeholders' sentiments. Additionally, there is a need to increase administrative capacity and control costs to make the NHI affordable and sustainable. In conclusion, the study highlights the inadequacies and challenges facing the South African healthcare system and the need for reform. The NHI may provide a solution, but its implementation faces significant threats, and its financial affordability and stakeholders' sentiments require attention. The study's recommendations provide a framework for future studies aimed at addressing these challenges to ensure the successful implementation of the NHI and healthcare reform in South Africa.

6.5 Contribution of the study

This study makes notable contributions to the body of knowledge in three key ways. Firstly, by employing a multi-pronged pre-implementation evaluation framework, which enhances the quality of findings and offers a more comprehensive evaluation. Secondly, the study highlights the usefulness of the Monte Carlo simulation technique in assessing the affordability of the scheme, due to the high level of uncertainty and significant dynamism of issues surrounding its affordability. This technique offers a robust and reliable means of evaluation, contributing to the existing literature on evaluation techniques. Lastly, the study shows that natural language processing techniques can be effectively used to analyze stakeholder sentiment from textual data, offering a quick and efficient means of evaluating sentiments, attitudes, and opinions of stakeholders. This finding has important implications for future studies and the evaluation of healthcare policies, where understanding stakeholder sentiment is crucial for the success of policy implementation.

6.6 Limitations to the study

As with all empirical studies, this study had its limitations. For one, this study only focussed on three aspects of an enormous, multifaceted scheme. Several assumptions also had to be made in this ex-ante evaluation of a pending scheme. In some instances, these assumptions were informed by incomplete information. This was especially so in the chapter that explored the affordability of the NHI. Further, as an ex-ante evaluation of an evolving policy on healthcare, conclusions drawn in later studies could change when the scheme is implemented as adjustments to some provisions are made. Notably, the projected economic changes due to the recent development may create additional threats to the scheme, affordability challenges and antagonistic stakeholder sentiments not captured by this study. Finally, using news articles in the sentiment analysis exposed the study to bias. However, despite these limitations, the study achieved its objectives and contributed to the evaluation of the NHI.

6.7 Recommendations for future studies

There are several avenues future studies can consider. For instance, consideration of more than the three systemic threats explored herein could be vital. Future studies can also use more sophisticated methods, such as actuarial estimations and other demand-based approaches to determine the scheme's affordability. Studies on whether a scaled-down version of the NHI is affordable may also be relevant. The examination of sentiment could also be extended methodologically to include interviews and questionnaires for direct analysis of sentiments. Future studies may also consider employing multiple natural language processing toolkits for improved robustness. Ex-post analyses of all the aspects may be considered as information on the vital aspects necessary for analyses would be available. One such ex-post study would be able to evaluate whether the implementation would change sentiment.

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APPENDIX

Appendix A – Turnitin report

14%	8%	8%	4%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to University of KwaZulu-Natal Student Paper	2%
2	bhfglobal.com Internet Source	1%
3	hdl.handle.net Internet Source	1%
4	www.science.gov Internet Source	<1%
5	www.euro.who.int Internet Source	<1%
6	www.hst.org.za Internet Source	<1%
7	www.gov.za Internet Source	<1%
8	worldwidescience.org Internet Source	<1%
9	new.esp.org Internet Source	<1%

Appendix B – Ethical clearance

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

Mr Hilary Tinotenda Muguto (210549918)
School Of Acc Economics&Fin
Pietermaritzburg

Dear Mr Hilary Tinotenda Muguto,

Protocol reference number: 00006684
Project title: The National Health Insurance Scheme in South Africa: A pre-implementation evaluation of systemic threats, financial affordability and stakeholders sentiments

Exemption from Ethics Review

In response to your application received, your school has indicated that the protocol has been granted **EXEMPTION FROM ETHICS REVIEW.**

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

PLEASE NOTE:
Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours sincerely,

[redacted]

Prof Mabutho Sibanda
Academic Leader Research
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