INTRODUCTION

An epidemic occurs when (typically) an infectious disease becomes widespread. This therefore excludes many health conditions that are not infectious. In fact, most prevalent health conditions in South Africa today are not infectious, or at least not thought to be. A health system must, however, cater for all conditions, including emergency care, conditions associated with lifestyle, ageing, maternity, and all the associated support services and functions. A health system encompasses multiple sub-systems which have complex interactions and requirements. Responding to epidemics forms only a part of the large range of its functions.

An epidemic is considered to have occurred when a particular disease demonstrates a significant increase in prevalence (or ratio of existing
occurrences) over and above some stable baseline (which can be zero occurrences). This can be distinguished from an outbreak, which typically refers to a limited (both in terms of geography and time) change in prevalence. A pandemic, by way of contrast, refers to an epidemic that stretches over wide geographic areas (multiple countries and continents). Although an epidemic is typically associated with infectious diseases, it refers equally to any significant change in the prevalence of any disease.\textsuperscript{1}

Epidemics therefore reflect significant health threats with many potential causes, not all of them predictable or even preventable. A health system must also focus on reducing pre-existing stable prevalence rates for all diseases, the only difference being that in the former instance the health system needs to respond to a change in the threat levels while in the latter it must focus resources on minimising an existing or known threat.

A health system that responds poorly to known threats can reasonably be expected to respond poorly to unexpected changes in circumstances with complex response requirements. More straightforward threats can, however, be addressed through focused one-off interventions that are not as reliant on a resilient health system. This is where the distinction between an outbreak and an epidemic is important. Whereas the latter may be addressed through a limited and focused intervention, the former may only be mitigated through integrated support from a working health system.

To better understand a country’s ability to respond to epidemics, rather than outbreaks, first requires an assessment of the capabilities of the health system as a whole. This chapter begins with a review of the current health system in South Africa through the use of proxy indicators of general capability. This is followed by a review of the extent to which the National Health Insurance (NHI) proposals, as presented to date (early 2019), are likely to influence the responsiveness of the health system to a general systemic threat such as an epidemic. This is followed by a discussion on the implications of the two assessments.

\textsuperscript{1} For a discussion of the distinction between outbreaks, epidemics, and pandemics see Centers for Disease Control and Prevention (CDC), 2006, 1-72.
Epidemics and the Health of African Nations

METHODOLOGY

Two assessments are offered in this chapter. The first reviews the capabilities of South Africa’s health system, while the second examines the extent to which the capabilities of the health system will be improved by the proposed NHI framework under consideration for the country. The assumption made is that indicators of capability are suggestive of the likely level of preparedness for any change in the health risks facing South Africa. Specific public health arrangements for responding to epidemics are therefore not assessed.

Capabilities of the health system

South Africa usefully generates a fair amount of data and information on the health system each year. While the various sources of data and information are not integrated, it is nevertheless possible to structure the information to provide a picture of the capabilities of the health system.

To avoid errors in attribution this analysis focuses on health indicators that are attributable principally to the capabilities of the health system rather than those that may derive from wider socio-economic conditions. Whereas the latter reflect challenges for the health system, the former relate to the responsiveness of the health system to challenges, whether known or unknown. To avoid distortions that may arise from historical high or low health performance, indicators will in certain instances be compared to benchmarks taken from peer countries rather than from baseline data.

Performance-related indicators could take the following forms: inputs, suggestive of the adequacy of resourcing; outputs, which could provide an indication of aspects of system efficiency; and outcomes, which offer a picture of what the system is able to achieve in relation to existing health challenges. Due to weaknesses in the usefulness of output data generated in South Africa, at least for the purposes of this analysis, the focus in this chapter is on input and outcome data of various forms.ii

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ii For an assessment of health data availability for hospitals in South Africa see Ranchod et al., 2017. (For a general discussion on indicators used to evaluate health systems performance see Cylus et al., 2016.)
Input information will rely on the most recent information (that for 2016/17) supplied by South Africa’s Office of Health Standards Compliance (OHSC) which provides evaluations of process-related indicators that may be suggestive of performance (OHSC, 2016/17). This information is based on inspections of public health facilities carried out over a period of time, resulting in scores which can be used both for comparison between facilities (league tables) and against a performance benchmark. In the latter instance this is set by the OHSC in its report at 80 per cent of the maximum possible score (OHSC, 2016/17). Data is available by facility and can also be weighted up to a provincial score.

Two outcome measures are considered: maternal mortality ratios (MMRs) (or the number of women per 100,000 live births who die as a result ofchildbearing during the pregnancy or within 42 days of delivery or termination of pregnancy during a given year) at a particular facility (Health Systems Trust, 2012: 1); and Auditor-General findings on financial performance.iii Both measures are regarded as objective (i.e. measures that are not susceptible to manipulation by public health facility managers) proxy indicators of managerial capability within the health sector. While there are potentially more accurate indicators for facility-based performance, when applied at a provincial and national level they are regarded as appropriate measures for provincial-level performance.

The assumption is that poor facility-based outcomes in maternity services are strongly suggestive of overall managerial capability, rather than just a weakness specific to maternity services. This is consistent with the use of mortality indicators for elective services used in other settings with better data. Similar assumptions have been made using 30-day acute myocardial infarction rates (Cooper et al., 2011).

While financial performance is technically an input indicator, it is assumed in this chapter that an inability to properly manage finances is an outcome indicator indicative of managerial (in)competence. This

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iii The Auditor-General of South Africa has the power to examine and report on the financial activities of government. The office of the Auditor-General audits national and provincial government departments, identified public entities, municipalities, and municipal entities. The Auditor-General is accountable to the National Assembly.
data is used principally to determine whether there is any consistency with the MMR results at a provincial level and for the country as a whole. The data source is the most recent Auditor-General report published in 2018 for provincial and national government (Auditor-General, 2018).

**National Health Insurance**

Although South Africa’s NHI proposals have been circulating for over ten years (Van den Heever, 2016), no implementation of any form has occurred to date. The review of NHI will consequently assess whether any of the proposals will address any of the system weaknesses identified through the analysis of capabilities. This assessment will rely on official texts, grey literature published on the NHI, and relevant scholarly literature. An important constraint in this review is the limited extent of any literature of substance on the NHI proposals. The Department of Health (DoH) has only produced superficial proposals, while National Treasury has published no financial analysis.

**CONTEXT**

This section provides a contextual overview of the South African health system for the more specific analyses that follow. Two features are covered: first, the organisation of the health system; and second, the burden of disease. The former offers an overview of the formal decision-making structures of the health system, and its expenditure levels and trends. The latter offers a profile of the prevailing disease patterns in South Africa at a national level, with an additional focus on the two most rapidly changing metropolitan regions, Johannesburg and Cape Town.

**Organisation of the health system**

South Africa’s health system has evolved over the past 100 years into two distinct sub-systems. The first is the public health sector which effectively provides coverage for around 84 per cent of the population (in 2016) (Council for Medical Schemes, 1980 to 2016; Statistics South Africa, 1980 to 2017) and which is largely provided and managed at a provincial level, with strategic aspects the responsibility of the DoH.
The constitution establishes health services as a concurrent function of national and provincial governments (Republic of South Africa, 1996). While local government does play a role in public health, this is not mandated by the constitution and occurs only when provincial health departments make use of local authorities on an agency basis. These mainly involve primary care services and emergency medical services in the major metropolitan areas (Van den Heever, 2016).

Figure 1: Health expenditure in South Africa expressed as a percentage of Gross Domestic Product 1995 to 2014


Sum of government expenditure: Total general tax funded expenditure by general government departments.

Sum of social security: Total contributory social insurance coverage for medical expenses (inter alia, the Compensation Fund for Occupational Injuries and Disease and the Road Accident Fund).

Sum of private pre-paid: Total contribution income to private medical schemes.

Sum of OOP: Total out-of-pocket expenditure.

The second sub-system is the regulated medical schemes which cover families (on an individual basis – often referred to as beneficiaries) with relatively high income earners, encompassing roughly 16 per cent of the national population (Council for Medical Schemes, 1980 to 2016;
Statistics South Africa, 1980 to 2017). A relatively minor source of coverage occurs through the Compensation Fund for Occupational Injuries and Diseases and the Road Accident Fund; these are indicated as ‘social security’ in Figure 1. However, both these schemes combined are responsible for less than 1 per cent of GDP in expenditure, compared to 4.1 per cent for the public sector and 4 per cent for medical schemes (see Figure 1; Department of Social Development et al., 2017). Out-of-pocket expenditure, a sign of coverage failure in health systems, forms a relatively minor 0.6 per cent of GDP and is mainly incurred by higher income groups on medical schemes and overall does not substantially involve catastrophic health expenses (Van den Heever, 2016).

When expressed as a percentage of GDP, health expenditure patterns in South Africa have been relatively stable over time, which is indicative of the long-term stability of the major institutional frameworks for financing and delivering health care in South Africa (Van den Heever, 2012; 2016).

**Burden of disease**

South Africa has faced a number of health care challenges over the past 30 years. Consistent with international trends, South Africa was facing declines in the prevalence of infectious diseases, together with increases in non-communicable disease. Both trends could be attributed to increased urbanisation, which tends to improve access to health services and population-based prevention programmes (i.e. vaccinations), but negatively alters lifestyles, which increases morbidity due to smoking, alcoholism, motor vehicle accidents, and obesity. However, prevalence rates for infectious diseases such as HIV/AIDS and tuberculosis (TB) began to increase substantially from 1997 (Coovadia et al., 2009; Development Bank of South Africa, 2008; Karim et al., 2009). This was largely due to the HIV/AIDS epidemic which, through attacking the immune system of infected individuals, caused TB infections to rise. From 2009, however, a downward trend in the burden of disease, measured as potential years of life lost (YLLs) due to premature deaths, can be observed for HIV and TB (Figure 2). It should be noted that prior to 2000 the YLL due to HIV/AIDS was negligible and TB was in decline (Karim et al., 2009).
While there are slow structural declines in the burden of disease from ‘social’ (communicable, maternal, perinatal, and nutritional) causes and ‘HIV/TB’ from 2009, both are from a very high, arguably unacceptably high, base. Maternal and child deaths, which form part of the ‘social’ category, are at unusual levels for a country with South Africa’s per capita income and health infrastructure (Schaay et al., 2011; National Planning Commission, 2011; Development Bank of South Africa, 2008). South Africa in fact failed to achieve any of its health-related Millennium Development Goals (MDGs) (WHO, 2018).

The very high HIV/AIDS and TB infection and prevalence rates in South Africa could also reasonably be attributed to the general failure of the HIV prevention programmes in the 1990s, for which both the pre- and post-apartheid governments are accountable through poor leadership and stewardship of the health system (Coovadia et al., 2009; Karim et al., 2009). Post-2000 the failure rapidly to introduce treatment programmes affected both mortality and new infections. The latter was because treatment with antiretroviral drugs reduces the viral load in infected individuals, thereby reducing their probability of infecting other individuals (Attia et al., 2009). A structurally lower HIV prevalence rate would, by reasonable inference, have had important implications for the burden of disease and the burden on the public health system. The actual trajectory of the disease into the 2000s as measured in the Actuarial Society of South Africa’s AIDS model (Actuarial Society of South Africa, 2008) in fact follows the ‘non-intervention’ scenario (i.e. where government does nothing) of the modelling analysis published early on in the epidemic in 1991 (Doyle et al., 1991). Whatever the South African health system implemented in the 1990s had no apparent effect on the worst epidemic to face South Africa in the 20th and 21st centuries. Related to these trends is the increase in drug-resistant TB which results from the poor management of TB treatment programmes, i.e. when patients do not complete their drug therapy (Karim et al., 2009).
Figure 2: Burden of disease for South Africa from 2009 to 2015

Source: Analysis used data from Health Systems Trust, 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Social</th>
<th>Garbage</th>
<th>HIV/TB</th>
<th>Ill-def</th>
<th>Injuries</th>
<th>Non-com</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>11,585,712</td>
<td>10,810,710</td>
<td>9,476,043</td>
<td>9,076,269</td>
<td>8,763,555</td>
<td>8,513,769</td>
<td>8,379,377</td>
</tr>
</tbody>
</table>

Social YLLs due to communicable, maternal, perinatal, nutrition causes.
Garbage YLLs due to garbage code deaths (not attributable).
HIV/TB YLLs due to HIV and TB.
Ill-defined YLLs due to ill-defined deaths.
Injuries YLLs due to injuries.
Non-com YLLs due to non-communicable diseases. iv

The increased YLL due to non-communicable diseases also represents an emergent epidemic that South Africa is not yet effectively able to address. While the YLLs expressed at a national level are relatively unchanged over time (Figure 2), those for fast-growing cities such as Johannesburg (Figure 3) and Cape Town (Figure 4) show that early mortality for NCDs is high and rising (although Johannesburg shows a decline to 2012 and then a sharp rise again to 2015). The very rapid population growth in provinces such as the Western Cape and Gauteng imply a moving target from a population health perspective.

iv Note that this includes all the diseases of lifestyle, e.g. diabetes and hypertension, which result from poor eating habits.
Preparedness for Epidemics in South Africa

Figure 3: Burden of disease trend for Johannesburg from 2009 to 2015
Source: Analysis used data from Health Systems Trust, 2017

Figure 4: Burden of disease trend for Cape Town from 2009 to 2015
Source: Analysis used data from Health Systems Trust, 2017

HEALTH SYSTEM CAPABILITIES

This section provides insights into the capabilities of the South African health system using three approaches. Maternity mortality ratios contrasted with benchmarks of appropriate performance; the quality
assurance assessments of health facilities as performed by the OHSC; and the audit outcomes produced by the Auditor-General. All three indicators offer insights into the general capabilities of the health system, seen individually and in combination.

**Maternal mortality ratios**
Maternal mortality ratios offer some insight into the capabilities of health services when compared to reasonable benchmarks based on the performances of other peer countries. South Africa’s facility-based MMRs at both a provincial and national level are far in excess of what occurs elsewhere for countries with a similar or lower level of economic development (Development Bank of South Africa, 2008; WHO, 2015). Figure 5 provides provincial averages of MMRs for three time periods: 2000–2004, 2005–2009, and 2010–2012.

These show that South Africa performs poorly relative to the appropriate benchmark of 19 (roughly consistent with the lowest estimate of performance by Chile, as indicated in Table 1). Apart from the Western Cape, which is slightly higher than international averages for peer developing countries, South Africa’s eight other provinces demonstrate very poor performances. The worst performers are the Free State and the Northern Cape, both of which have MMRs in excess of 200 (Figure 5).

When South Africa is compared to other countries it performs poorly relative both to peer countries (those with a roughly similar level of economic development) in general, and against benchmark countries (those with a roughly similar or lower level of development with good achievements in lowering MMRs) in particular (Table 1).

Chile, for instance, has an average MMR of 22 compared to 138 for South Africa, as reflected in Table 1. China and Costa Rica are 27 and 25 respectively. Even poorly performing peer countries such as Brazil (44), Colombia (64), and Ecuador (64) perform better than the best performing province in South Africa, which is the Western Cape at 77.

Industrialised countries have MMRs that are below 10, except for the United States of America (Table 1). It is worth noting that the health systems arrangements in these countries vary widely. For instance, Brazil, Chile (Velasco et al., 2018), Argentina (Cotlear et al.,
Preparedness for Epidemics in South Africa

2015), Colombia (Bauhoff et al., 2018), Belgium (Schokkaert et al., 2018), Israel (Brammli-Greenberg et al., 2018), and the Netherlands (Schut and Varkevisser, 2017) have regulated private insurance systems that either form the basis of their universal coverage model or a substantial part of it. All the developing country health systems have mixed private and public sector regimes with industrialised countries either dominated by regulated private markets (most of the instances in Table 1) or a public regime, e.g. United Kingdom (Böhm et al., 2013), Australia (Paolucci et al., 2018).

Figure 5: Facility-based maternal mortality ratios by province compared to international benchmarks for countries at an equivalent level of development to South Africa

Legend: EC = Eastern Cape; FS = Free State; GP = Gauteng; KZN = KwaZulu-Natal; LP = Limpopo; MP = Mpumalanga; NC = Northern Cape; NW = North West; WC = Western Cape.

Table 1: Maternal mortality ratio estimates for South Africa and relevant comparator countries (2015)

<table>
<thead>
<tr>
<th>Country</th>
<th>MMR</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing countries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>138</td>
<td>124</td>
<td>154</td>
</tr>
<tr>
<td>Argentina</td>
<td>52</td>
<td>44</td>
<td>63</td>
</tr>
<tr>
<td>Country</td>
<td>MMR</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>Developing countries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>44</td>
<td>36</td>
<td>54</td>
</tr>
<tr>
<td>Chile</td>
<td>22</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>China</td>
<td>27</td>
<td>22</td>
<td>32</td>
</tr>
<tr>
<td>Colombia</td>
<td>64</td>
<td>56</td>
<td>81</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>25</td>
<td>20</td>
<td>29</td>
</tr>
<tr>
<td>Cuba</td>
<td>39</td>
<td>33</td>
<td>47</td>
</tr>
<tr>
<td>Ecuador</td>
<td>64</td>
<td>57</td>
<td>71</td>
</tr>
<tr>
<td>El Salvador</td>
<td>54</td>
<td>40</td>
<td>69</td>
</tr>
<tr>
<td>Malaysia</td>
<td>40</td>
<td>32</td>
<td>53</td>
</tr>
<tr>
<td>Romania</td>
<td>31</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>30</td>
<td>26</td>
<td>38</td>
</tr>
<tr>
<td>Vietnam</td>
<td>54</td>
<td>41</td>
<td>74</td>
</tr>
<tr>
<td><strong>Industrialised countries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>6</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Austria</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Belgium</td>
<td>7</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Canada</td>
<td>7</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Israel</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Netherlands</td>
<td>7</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Spain</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>9</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>United States of America</td>
<td>14</td>
<td>12</td>
<td>16</td>
</tr>
</tbody>
</table>

*Source: WHO, 2015*

**SOUTH AFRICA’S UNDERPERFORMANCE**

The data presented here would suggest that the South African public sector is poorly managed relative to other developing countries, with the strongest management performance in the Western Cape and the weakest in the Free State and Northern Cape. The consistency of the results over time suggests that management weaknesses are structural and unresponsive to existing accountability regimes, whether administrative or ultimately political in nature. An analysis of the confidential enquiry maternal
mortality data reports that while HIV-related mortality has seen a slight downward trend, haemorrhage-related facility-based mortality rates are increasing (Moodley et al., 2014), which is indicative of a worsening of service provision. They also identify the following preventable aspects of maternal mortality, most of which fall within the domain of the health services to resolve: 49 per cent of maternal deaths are patient related ‘and include delays in seeking care, problems with transport to facilities, and also some women who accessed unsafe termination of pregnancy by unregistered providers. Administrative problems occurred in 35% of maternal deaths. This included problems with transport between facilities; access to intensive care units; availability of blood and inadequate staff numbers/competence. Healthcare provider problems occurred in 14–38% of maternal deaths with more episodes at district and regional hospitals than tertiary. This included not assessing patients properly, delays in referral, failure to recognise the problem; not following standard protocols and poor monitoring.’ (Moodley et al., 2014: 58).

Office of Health Standards Compliance and the achievement of core quality assurance norms and standards

The Office of Health Standards Compliance (OHSC) is a statutory body established at the national level of government to audit the quality assurance levels of all health facilities. To date it has focused only on public facilities and will eventually expand to private facilities. Its functions include:

- ‘Monitoring and enforcing compliance by health establishments with norms and standards prescribed by the Minister of Health in relation to the national health system’;
- ‘Ensuring consideration, investigation and disposal of complaints relating to non-compliance with prescribed norms and standards for health establishments in a procedurally fair, economical and expeditious manner.’
- ‘The term health establishment refers to both public and private healthcare services and facilities.’
Epidemics and the Health of African Nations

- ‘It includes hospitals and primary healthcare clinics and extends to emergency medical services, hospices, private medical practices and institutions offering frail care.’ (OHSC, 2018).

To assess capabilities of the South African health system the data from the 2016/17 audit of the OHSC has been weighted provincially using hospital bed data provided by the DoH (DoH, 2013). Table 2 presents the results and compares them to the MMR provincial averages for the period 2010–2012. Although the data is from two different time periods, they are regarded as sufficiently close in time to draw meaningful conclusions.

Table 2: Office of Health Standards Compliance scores for hospital facilities weighted up to a provincial level compared to provincial MMRs for 2010–2012

<table>
<thead>
<tr>
<th>Province</th>
<th>Weighted average quality score from the OHSC (2016/17) (highest score = 100)(benchmark = 80)</th>
<th>MMR (2010–2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Cape</td>
<td>74.52</td>
<td>77.13</td>
</tr>
<tr>
<td>Gauteng</td>
<td>72.23</td>
<td>141.07</td>
</tr>
<tr>
<td>Eastern Cape</td>
<td>59.00</td>
<td>167.23</td>
</tr>
<tr>
<td>North West</td>
<td>73.57</td>
<td>179.23</td>
</tr>
<tr>
<td>Limpopo</td>
<td>61.43</td>
<td>182.67</td>
</tr>
<tr>
<td>KwaZulu-Natal</td>
<td>71.25</td>
<td>185.23</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>58.40</td>
<td>194.17</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>46.28</td>
<td>202.60</td>
</tr>
<tr>
<td>Free State</td>
<td>63.00</td>
<td>209.37</td>
</tr>
</tbody>
</table>

Source: The OHSC data is based on the OHSC Annual Report 2016/2017. The MMR data is from Table 1 and repeated for comparison with the OHSC. Usable public hospital bed data by province was sourced from the NDOH, 2013.

While the results show a degree of consistency between the two proxy indicators of managerial capability, it appears that the OHSC potentially overstates the capabilities in some provinces, assuming that the MMR is a better indicator of performance. Western Cape scores best on the OHSC and the MMR, and Northern Cape and Free State score very low on the OHSC and the lowest on the MMR.
Outliers in the scoring are Gauteng, North West, and KwaZulu-Natal, all of which score above 70 on the OHSC (suggesting they are in the same range of performance as the Western Cape) but very poorly on the MMR (much lower than the Western Cape MMR).

The two forms of analysis shown in Table 2 are, however, potentially incompatible as the features of hospital performance are too distant (or upstream) from health outcome measures, as argued by Van Biljon (2018). This facility-based study that compared perinatal mortality rates with the OHSC assessments found very poor correlations, consistent with the general picture reflected in Table 2, as the OHSC reviews are effectively not measuring factors important to outcomes. Another finding was that of no improvements in perinatal mortality linked to the accreditation process. It is therefore argued that the OHSC is not truly measuring quality, raising the possibility that hospitals may improve their OHSC scores while facing worsening outcomes.

Even with the potential over-estimate of expected performance in some provinces, the OHSC results are consistent with a poorly performing public health system, with all provinces, barring Western Cape, considerably below the benchmark requirement of 80. Only 16 hospitals out of a total of 135 assessed scored 80 and above, i.e. are at an acceptable standard of performance. This equates to 11.9 per cent of all public hospitals and 18.8 per cent of all public hospital beds. Overall this is suggestive of a poorly performing public health sector even with the potential overstatement of performance in some provinces by the OHSC.

**Auditor-General**

The most recent Auditor-General report applies to the 2016/17 financial year (Auditor-General, 2018) and offers overview results by province and for major government functions. As the health function forms roughly 30 per cent of overall provincial spending, the performances of the provincial governments is broadly indicative of the capabilities of the health functions. This section provides two results: first, the summarised provincial results (Table 3); and second, by assessments of the health departments (Table 4).
The ‘clean audit’ results (‘where the financial statements are free from material misstatements and there are no material findings on reporting on performance objectives or non-compliance with legislation’ (Auditor-General, 2012: 4), by province are broadly consistent with the MMR and the OHSC results. The Western Cape achieves an 83 per cent result, with the next nearest province Gauteng at a relatively poor 52 per cent. No other province achieves more than 24 per cent. Irregular expenditure also stands at a relatively minor R44 million for Western Cape while the other provinces range from R860 million to R9.917 billion. Although these results are not health department specific, they suggest that the management weaknesses are influenced by governance at the wider provincial level. The Free State, KwaZulu-Natal, and North West all have irregular expenditure in excess of 8 per cent of their levels of expenditure – at 11.9 per cent, 9.0 per cent, and 8.2 per cent respectively.

Table 3: Provincial overview of findings by province (2016/17)

<table>
<thead>
<tr>
<th>Province</th>
<th>Clean audits (%)</th>
<th>Financially unqualified financial statements (%)</th>
<th>No findings on performance reports (%)</th>
<th>No findings on compliance with legislation (%)</th>
<th>Irregular expenditure with the percentage of expenditure in brackets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Cape</td>
<td>83</td>
<td>94</td>
<td>89</td>
<td>94</td>
<td>R44 million (0.1%)</td>
</tr>
<tr>
<td>Gauteng</td>
<td>52</td>
<td>100</td>
<td>68</td>
<td>57</td>
<td>R6.367 billion (5.9%)</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>24</td>
<td>76</td>
<td>71</td>
<td>24</td>
<td>R2.218 billion (5.3%)</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>23</td>
<td>85</td>
<td>69</td>
<td>23</td>
<td>R1.050 billion (6.7%)</td>
</tr>
<tr>
<td>Eastern Cape</td>
<td>19</td>
<td>86</td>
<td>57</td>
<td>19</td>
<td>R860 million (1.2%)</td>
</tr>
<tr>
<td>Free State</td>
<td>13</td>
<td>47</td>
<td>36</td>
<td>0</td>
<td>R3.860 billion (11.9%)</td>
</tr>
</tbody>
</table>
### Preparedness for Epidemics in South Africa

<table>
<thead>
<tr>
<th>Province</th>
<th>Clean audits (%)</th>
<th>Financially unqualified financial statements (%)</th>
<th>No findings on performance reports (%)</th>
<th>No findings on compliance with legislation (%)</th>
<th>Irregular expenditure with the percentage of expenditure in brackets</th>
</tr>
</thead>
<tbody>
<tr>
<td>KwaZulu-Natal</td>
<td>12</td>
<td>79</td>
<td>64</td>
<td>12</td>
<td>R9.917 billion (9.0%)</td>
</tr>
<tr>
<td>North West</td>
<td>5</td>
<td>37</td>
<td>35</td>
<td>5</td>
<td>R3.065 billion (8.2%)</td>
</tr>
<tr>
<td>Limpopo</td>
<td>5</td>
<td>60</td>
<td>45</td>
<td>10</td>
<td>R2.471 billion (4.1%)</td>
</tr>
</tbody>
</table>

*Source: Auditor General, 2018; National Treasury, 2018*

When the Auditor General compared the financial health of the health and education departments with other departments it is clear that while both health and education perform poorly, health departments stand out as the worst performing. Overall only one health and one education department achieve a ‘good’ result, defined as having fewer than 30 per cent unfavourable indicators. For health departments 37 per cent raises concerns, and 50 per cent requires an intervention. Other departments achieve a ‘good’ result in 42 per cent of cases, with 8 per cent requiring an intervention. The Auditor General in fact notes that urgent action is required to prevent a collapse of health services:

*The financial health of provincial departments of health and education needs urgent intervention to prevent the collapse of these key service delivery departments. In comparison with the other departments, these sectors (particularly the health sector) are in a bad state. (Auditor General, 2018: 76).*
Table 4: Financial health and unauthorised expenditure for health, education, and other departments at a provincial level (number of departments relevant to the outcome in brackets)

<table>
<thead>
<tr>
<th>Departments</th>
<th>Good</th>
<th>Of concern</th>
<th>Intervention required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health departments</td>
<td>13% (1)</td>
<td>37% (3)</td>
<td>50% (4)</td>
</tr>
<tr>
<td>Education departments</td>
<td>11% (1)</td>
<td>78% (7)</td>
<td>11% (1)</td>
</tr>
<tr>
<td>Other departments</td>
<td>42% (60)</td>
<td>50% (72)</td>
<td>8% (12)</td>
</tr>
</tbody>
</table>

Source: Auditor-General, 2018: 76

Note: Explanation of headings in Table 4:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>Fewer than 30% unfavourable indicators.</td>
</tr>
<tr>
<td>Of concern</td>
<td>30% or more unfavourable indicators.</td>
</tr>
<tr>
<td>Intervention required</td>
<td>Significant doubt that can continue in future (vulnerable position) and/or where auditees received a disclaimed or adverse opinion, which meant that the financial statements were not reliable enough for analysis.</td>
</tr>
</tbody>
</table>

Source: Auditor-General, 2018: 72

Discussion of results

All three sets of indicators presented in this section support the finding that the South African public health system is poorly managed and is operating below its potential. The health outcome indicator, in the form of facility-based MMRs, directly implicates the health services, rather than wider socio-economic factors, as the source of higher than normal mortality. Countries of a similar level of development to South Africa and with comparable or lower levels of fiscal support for public health services achieve better MMR results (also see Development Bank of South Africa, 2008). There is no evidence that suggests that South Africa’s public health services are improving. The contrary appears to be more accurate.

When these results are compared with the weak responses to the HIV/AIDS and TB epidemics from 1994 to 2002, the evidence supports the view that the public health system is in a fragile state and is suggestive of systemic governance failures. The failure of the health system adequately to prevent both HIV and TB during the 1990s has resulted in a more severe AIDS and TB epidemic than would otherwise
have been the case. This has added to the strains on an already fragile system, diverting resources away from the emergent epidemics in non-communicable diseases.

An important indicator of governance failure is the evidence of endemic corruption that has been widely reflected in almost every sphere and organisation of the public sector. Evidence of this can be found in the high levels of irregular expenditure identified by the Auditor General as well as in the extensive moonlighting by key public sector staff such as nurses (Rispel et al., 2014). The causes of governance failure in the public health sector have not, however, been systematically researched to date. As with other state institutions, institutionalised systems of patronage (networks based on familial relationships and quid pro quos) operating through incumbent political parties represents the most reliable explanation of failure (Public Protector, 2016; Von Holdt, 2013).

When patronage is combined with centralised decision-making, the capture of strategic functions such as staff appointments, the issuing of licences and associated regulation of various entities both public and private, and procurement is potentially inevitable. Governance reform within the public health system therefore needs to consider all avenues to eliminate the structural occurrence of systems of patronage while implementing institutional frameworks that incentivise good performance and responsiveness to the served community. These systems weaknesses are structural because they derive from the current institutional framework; they can only be removed through an adjustment to the institutional framework.

While the relatively devolved nature of the public health system offers opportunities for increased accountability to the served population, in the absence of institutional frameworks that address conflicts of interest and that localise accountability, it is inevitable that principal-agent problems will arise (i.e. where the principal in the form of the served community will not be able to steer the conduct of the agent in the form of health service providers and administrators). As far as possible, therefore, principal-agent problems must be addressed structurally to address any misalignment of incentives by agents. However, governance redesign through the distribution of mandates and accountability structures is complex and needs to consider carefully existing structures
Emerging health systems designs involve the following key features consistent with a multi-level governance framework (Abimbola et al., 2014; Maino et al., 2007; Östergren et al., 2007): the separation of political decision-making from operational decision-making; the centralisation of strategic resource allocation decisions to ensure the equitable distribution of resources; the distribution of health service decision-making to the most appropriate level (with strategic decisions more central, and operational decisions closest to the ground); and the introduction of accountability frameworks such that each level of decision-making is accountable to the most relevant role-players and stakeholders such that the public interest is served. A careful mix of mandates, accountability regimes, institutional flexibility, financing mechanisms, and quasi and actual contracting approaches is an inevitable feature of a well-functioning health system.

It is within the context of South Africa’s health system weaknesses and reform imperatives that consideration must be given to the adequacy of the proposed NHI as a means to improve the system’s capabilities.

ADEQUACY OF REFORM PROPOSALS – NATIONAL HEALTH INSURANCE

Overview
The government process to consider a NHI began in 2009 with the establishment of a ministerial advisory committee with Dr Olive Shisana as the chairperson (DoH, 2009). Various reports have outlined the NHI policy framework to date. These include a Green Paper and two White Papers (DoH, 2011; DoH, 2015; DoH, 2017).

The official government processes have therefore run from November 2009 to 2019 (the present) – a period of 10 years. During this period all incremental structural reforms of the health system were halted until such time as the NHI policy could be finalised and implemented (Van den Heever, 2016). This included the halting and withdrawal of all structural reforms of the private health system which were in the process of implementation during 2008 (Van den Heever,
2016; Beresford, 2008). Furthermore, no consideration was given to achieve governance reforms of the public system.

The apparent reason for blocking incremental reforms was due to the assumption that the complete NHI framework could be implemented in a single year, i.e. over the period 2009 to 2010 (Van den Heever, 2011). However, even when it became clear that this was not possible, the de-prioritisation of incremental reforms remained in place.

While there has been an extensive public discourse on the NHI over this period, research papers, technical reports, implemented systems, or even a business case have not been taken into account. Most proposals are descriptive in form with no systematic evaluations forming the basis for technical reforms.

Some research was attempted through the implementation of 11 NHI pilot projects from 2012. However, there is no evidence of what they were meant to research or what they achieved (Section 27, 2016; Khan, 2016; Magubane, 2017; Botha, 2018). In fact, no independent evaluation has ever been made public on the pilot project outcomes.

What is proposed?
The main motivation for the NHI framework can be reduced to a simple statement indicating that South Africa has a two-tier health system and must implement a single-tier health system (DoH, 2011). The general narrative argues that South Africa must implement universal health coverage (UHC) on the implied (but never stated) assumption that universal coverage does not exist.

\emph{NHI will provide coverage to the whole population and minimize the burden carried by individuals of [sic] paying directly out of pocket for healthcare services. This model of delivering health and healthcare services to the population is well accepted, described and widely promoted by the World Health Organization as universal coverage.} (DoH, 2011: 5)

The NHI is motivated as a financing scheme in which the functions of ‘pooling’ (which is the achievement of cross-subsidies from rich to poor and from those who don’t need health care today to those
who do) and ‘purchasing’ (which refers to contracting or buying health services) are consolidated into a single national organisation, the National Health Insurance Fund (NHIF). Combining pooling and purchasing involves a considerable departure from the current health system where (what can be regarded as) purchasing is the function of provincial governments and medical schemes.

Although somewhat unclear between the various government papers, the NHI proposals involve the introduction of general tax increases roughly equal to 3 per cent of GDP (DoH, 2011) in an attempt to redirect all health spending through the NHIF. As the central idea behind the NHI is to establish a single-tier system, inter alia the feasibility of such a tax increase is therefore a cornerstone of the entire scheme. However, to date no official analysis has been produced of the viability of such a proposal and the Minister of Health has announced to the media that no such analysis will be produced (Mail & Guardian, 2012).

Government already achieves a substantial degree of pooling via the tax system and the prevailing system of unconditional and conditional transfers to provincial governments and medical schemes (via the tax credit that can be claimed for medical scheme contributions). However, pooling is considerably less onerous as a function than purchasing, which requires a combination of administration, regulation, and contracting. The idea that the purchasing function will in future be consolidated in a single organisation, the NHIF, therefore has significant institutional and governance implications which have not been officially assessed. It is questionable whether a superior degree of pooling will be achievable relative to the current framework. A substantial transfer from rich to poor is implicit in the public health system as high-income earners are removed from coverage (i.e. they are either covered by medical schemes or must pay for public hospital services).

A key thematic idea arising in the NHI proposals is the (assumed) superior purchasing efficiencies that will be derived from the introduction of a ‘purchaser–provider split’. This institutional approach distinguishes between the organisation that buys and those that offer health care services. The present public health system, by way of contrast, is characterised by vertical integration, where the
purchaser is also the provider of health services. For instance, a public hospital merely forms part of the provincial administrative hierarchy, falling ultimately under a single accounting officer in the form of a provincial head of department (HOD). The shift to a purchaser-provider approach consequently requires the full decentralisation of health services so that they can be contracted individually, together with private sector services. The (constitutional) role of provincial health administrations in organising context-specific health strategies is not discussed or evaluated in the various official papers or in the draft NHI bill (DoH, 2018). No strategy to decentralise health service decision-making has to date been articulated, evaluated, or initiated.

The proposals also envisage that the entire population of South Africa would need explicitly to enrol as beneficiaries of the system, along the lines of medical scheme members. In addition, individuals would need to choose actively a primary health care provider to be pre-funded by the NHIF on their behalf. Therefore, not only would the NHIF need to administer 56 million enrollees, who could technically not receive benefits without being enrolled, but also manage their self-assignment to health facilities. At present, however, to receive free public services no one needs to enrol. Enrolment with an insurer is typically only required where a need exists to determine an entitlement to benefits (i.e. exclude non-contributors) in exchange for a contribution – such as a social insurance fund and a private medical scheme. This proposal is therefore a considerable undertaking for which no precedent exists in South Africa.

It is also proposed that the financing of hospitals be activity based (i.e. payment per individual medical activity), using diagnostic related groupers (DRGs) (a grouper is a group of diagnoses with a similar average cost). This would require that patient utilisation be matched with enrollee information so that reimbursable admissions can be validated against a diagnostic code (i.e. a hospital admission associated with a diagnostic code triggers a payment based on the cost associated with the group of diagnoses into which a diagnosis falls). This form of reimbursement would also require authentication against service use to prevent hospitals from misrepresenting the diagnostic codes to increase their revenues. Treatment validation would require the
universal (public and private sector) implementation of electronic patient records and associated business processes at a very high standard at all levels of care. Some form of ongoing costing analysis would need to be maintained constantly to re-weight the DRGs. To date the DoH has not managed to produce a domestically costed DRG schedule or to establish a system to institutionalise it.

To prevent the excessive use of private sector hospitals (proposed to form part of the NHI network of provider services), which are perceived to be of a higher standard than public hospitals, public sector hospitals would need to be governed, managed, staffed, and equipped at similar levels to private hospitals before the implementation of the overall system. This would require more than the achievement of OHSC core standards, which only 18.8 per cent of public hospital beds by 2018 were able to attain. By early 2019 no strategy to upgrade the public hospital system has been evaluated or proposed.

The NHI proposals envisage that an internal market be created for hospital services as in the English National Health Service in the United Kingdom. Here funding follows patients (consistent with the DRG approach). However, this results in the systemic underfunding of smaller hospitals and the risk of closure or public hospital mergers (Gaynor et al., 2012). The proposals, however, do not elaborate on this complex reliance on competition as a governance and accountability regime or how it would form part of a complete system of governance and accountability. No technical report or assessment of how this could be applied in the South African context has ever been presented.

The policy framework also envisages the implementation of a standard minimum package of health services. This would require the statutory specification of some package of services, diagnoses and/ or treatment protocols that are guaranteed as a right. By early 2019 no such package has yet been articulated or costed. While measures such as an essential drugs list (EDL) are relatively straightforward to determine, and already exist, to specify a positive set of hospital and out-of-hospital services (which includes all clinic-based primary care and public health interventions) would require considerable effort if attempted as a national top-down process. To date no technical report has ever been presented on how this approach may be implemented.
Preparedness for Epidemics in South Africa

The NHI proposals also propose the central (national) determination of referral networks, with possible bypass fees. As with a number of NHI proposals, the legal framework already exists to allow this with existing public services. It has, however, never been implemented due to the systemic unfairness that would exist if low-income communities were penalised for bypassing poorly performing public services in their area (from personal experience of the author as the finance director of the Gauteng Department of Health in 1998 to 2000). It is worth noting that the DOH has up to early 2019 not been able to establish an organised system of referrals in the public sector.

The governance model for the NHIF, which is intended (at least as stated) to procure all health services in South Africa for the entire population (including those currently on medical schemes), is effectively appointed and removed by one person, the Minister of Health (MOH). The board members are recommended by the MOH and appointed by cabinet and also removed by the MOH (DoH, 2018: Section 14). The MOH also has wide discretion to appoint acting board members and to remove them.

While the NHIF board gets to shortlist and nominate a candidate for the position of chief executive, the actions must be approved by the MOH. Although the bill refers to an independent board, ample scope exists for the MOH to influence the membership and tenure of the board (in particular concerning acting members), and thereby the board’s material decisions, including the shortlist of chief executive candidates.

This approach to governance leaves wide scope for extracting patronage, through the person in the position of MOH. Such practices have resulted in the failure of provincial health services and in South Africa’s state-owned enterprises (SOEs). No technical review has been performed to justify the governance approach and explain how it will appropriately align incentives throughout the health system. No justification is provided for why the MOH should have such powers of appointment and removal within a domestic context where the experience demonstrates that it runs counter to the public interest.

It is also proposed that sub-regional contracting structures will be implemented by the NHIF. However, these appear to be subordinate structures within the NHIF administrative hierarchy. It is worth
noting that this is quite different to the NHS in the United Kingdom (Vrangbaek, 2007) and the Canadian health system (Martin et al., 2018), both of which have established fully decentralised and genuinely independent regional structures (trusts) that organise the services and purchasing for their areas.

The NHIF is proposed as a national structure in which no structural decentralisation is envisaged. It is not specified how the NHIF will hold the massive administration accountable or how it will cooperate with provinces on spatial and public health strategies. It merely states that they should coordinate. No guiding vision has been provided. Therefore, it is unclear how the transition will be affected from what exists to an untested and sparsely articulated institutional framework.

A complaints and appeals regime is also proposed, with a tribunal that is appointed by the MOH with a secretariat provided by the chief executive of the NHI (an MOH appointee). The bill also allocates powers to this tribunal equivalent to those of the high court. By early 2019 no policy document or evaluation has been produced to demonstrate why this approach was adopted and why a truly independent structure was not preferred.

**Discussion of proposals**

With a few qualifications, South Africa does have a system of UHC, although, as discussed above, it is plainly degrading in both the public and private systems due to structural weaknesses which are likely to weaken coverage and the quality of services further over time (Van den Heever, 2016; Health Market Inquiry (South Africa), 2018).

However, South Africa has one of the lowest levels of out-of-pocket expenditure in both the developing and developed world (Van den Heever, 2016) (also see Figure 1), which suggests that the coverage problem is not serious. The rationale for NHI and UHC appears to have been *lifted* from contexts where UHC strategies are needed to close gaps in coverage rather than to address weaknesses in the institutional framework and governance. As South Africa has a free public service for those who cannot contribute to their own health care, coverage is less of a problem than the quality and sustainability of coverage. All three major government reports on NHI are in fact silent on the extremely
complex questions of governance and institutional coherence and their relationship to the alignment of incentives, the key areas essential to addressing the quality of coverage (National Department of Health, 2011; 2015; 2017).

The three major government reports furthermore blur the lines between the concepts of NHI and UHC. While the former is merely a mechanism to achieve UHC, there are in fact multiple approaches (mechanisms) for achieving the objective of UHC (Kutzin, 2001; McPake and Hanson, 2016) and all but a handful of industrialised countries involve some form of single-tier centralised insurance model. Countries do not adopt particular models. Rather, their systems evolve in accordance with the opportunities offered from their institutional context. The conflation of the ideas of UHC and NHI was explicit in the Green Paper stating that ‘this model of delivering health and healthcare services to the population [NHI] is well accepted, described and widely promoted by the World Health Organization as universal coverage’ (DoH, 2011: 5). The choice of mechanism to achieve UHC is a complex reform with the result that changes are invariably incremental, path-dependent (or significantly constrained by past decisions) and context-specific.\(^v\)

The NHI proposals do not offer an answer to the failures of either the public or private health systems, while not actually demonstrating concretely that the key features of the system are in fact implementable. The draft bill offers no certainty that any aspect of the NHI will be operational in the foreseeable future. Even if the NHI were to be fully implemented, it still does not address the systemic weaknesses of the public and private health systems which have been identified to date in numerous inquiries and official processes (DoH, 1995; DoH, 1997; DoH, 2002; Taylor Committee, 2002; Armstrong et al., 2004; Ministerial Task Team on Social Health Insurance, 2005; Council for Medical Schemes, 2006; Health Market Inquiry (South Africa), 2018).

On the grounds of feasibility the following proposals, which are critical to the success of NHI, are also unlikely ever to be implemented:

- The financing of the NHI at a level that would result in coverage

\(^v\) See Hayes, 2006: for an extensive discussion on the limits to non-incremental policy reform when faced with complexity.
for the full population within a single scheme, with the proposal for general tax increases of up to 3 per cent of GDP.

- The substitution of existing ‘purchasing’ functions from provinces and private medical schemes into a single national public entity.
- The enrolment of the entire national population onto a single registry, which also administers beneficiary allocations to primary care providers.
- The implementation of a purchaser-provider split in the public health system.

The most concerning aspect of the NHI reforms, however, has been the obstruction of incremental reforms to long-existing systems in both the public and private sectors that would enhance the capabilities of the health system to deal with major health-related threats, such as epidemics. No legislative development of any substance has occurred from 2004 to the present day in either the public or private sectors. As a consequence basic systems of governance have not been upgraded nor resource allocation mechanisms updated, despite accumulating evidence of system weaknesses that are amenable to intervention. The flawed governance frameworks that are exposed to patronage have been retained and, furthermore, in the NHI framework it is proposed that they be maintained.

Given the above, the most probable scenario for the South African health system going forward involves the maintenance of the status quo with the possible implementation of an NHIF which is unlikely to become fully operational. As a consequence all the weaknesses in the public and private systems apparent to date are likely to persist and thereby continue incrementally to weaken health coverage in South Africa. The ability of the health system to both anticipate and address complex health-related threats such as epidemics is therefore likely to deteriorate rather than improve.

CONCLUSIONS

This chapter sought to review the current capabilities of the South African health system with a view to forming a view on its readiness to
address epidemics. The results suggest that the health system is fragile and is weakening over time. Three major epidemics have impacted on the system from the 1990s to the present, HIV/AIDS, TB, and non-communicable diseases. The initial weaknesses of the health system have allowed the epidemics to stabilise at very high levels, further increasing the fragility of the health system. Evidence of public health system capabilities through input and outcome indicators suggests considerable underperformance relative to reasonable benchmarks. This can largely be attributed to the prevailing governance framework which exposes health services to patronage systems and the resulting institutionalised corruption. Presently there are no proposals emanating from the South African government to address these weaknesses. In the absence of meaningful reforms to the governance framework, health coverage is likely to deteriorate incrementally. Not only does this imply that existing epidemics will not be adequately addressed, but that new epidemics will be poorly managed.

While the NHI proposals could be argued to address the structural weaknesses of the health system, when the detail is examined, all the prevailing systemic weaknesses are retained, with the added confusion of an attempt to implement an untested reform that is not evidence based. Based on the failure to implement incremental reforms over the past 10 years, it is quite likely that the pursuit of the NHI policy framework will continue to obstruct the consideration of workable reforms that address the fundamental challenges in the health system. It is a well-understood feature of policy change over time that non-incremental complex policies rarely succeed (Pierson, 2000; Hayes, 2006) and that most policy change is incremental and of necessity acknowledges existing implemented policy as the starting point. The NHI reforms, however, presume a blank sheet and ignore all existing implemented policies. The overtly political nature of the proposals (Van den Heever, 2016) has removed the checks and balances that normally constrain unrealistic policy proposals and has allowed them to obstruct real reform. If permitted to continue, the capabilities of the health system will further deteriorate and reduce its capacity to respond to complex threats – which include epidemics.
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The ability of national health systems to detect and respond to disease threats is the difference between containing an outbreak and facing a calamity. Strong systems for the monitoring and detection of diseases are crucial as they provide countries with the necessary mechanisms to effectively manage disease outbreaks. Yet in many African countries, which shoulder a disproportionate burden of disease, the systems required to enable decisive action are on the brink of collapse or are accessible only to some population groups.

The International Health Regulations (IHR)\(^i\) (2005) state that countries should be able to detect, assess, and respond to all incidents that may lead to public health emergencies of international concern (PHEICs) and report them to the World Health Organization (WHO, 2008).

\(^i\) The IHR are an international legal instrument that is binding on 196 countries across the globe, including all the Member States of WHO. Their aim is to help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide.