

Essential facts about

Covid-19

**The disease,
the responses and
an uncertain future**

**For South African Learners,
Teachers and
the General Public**



Commissioned by the Academy of Science of South Africa (ASSAf)



The **Academy of Science of South Africa** (ASSAf)

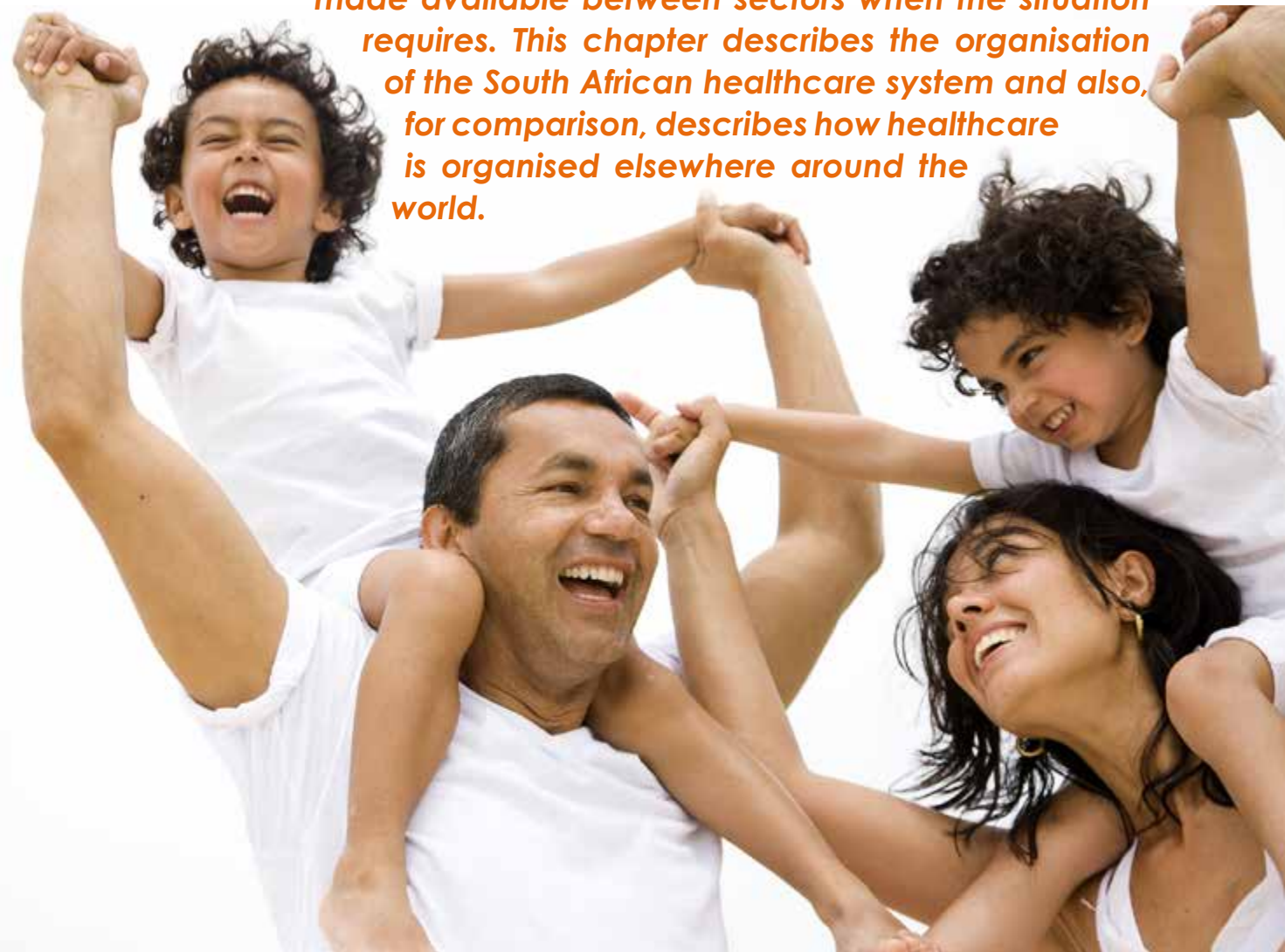
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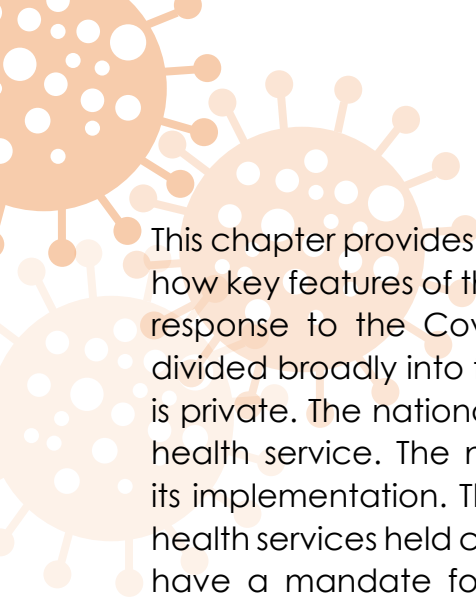
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The South African Healthcare System and Covid-19

South Africa has a dual healthcare system. For the majority of South Africans, healthcare is provided for by the state, through the national, provincial and local healthcare systems. Healthcare is provided at tertiary (academic teaching hospitals, for example Groote Schuur, Tygerberg, King Edward VIII and Baragwanath teaching hospitals), secondary and regional hospitals and local clinics. A parallel private healthcare system is based on an insurance scheme and is funded by medical schemes (such as the Discovery Health). Private healthcare is available to more affluent South Africans able to pay the premiums for these schemes. All systems are regulated by the Health Ministry. The state system is overstretched and struggles to provide adequate healthcare for the majority of South Africans unable to afford medical insurance. The coronavirus pandemic has aggravated this situation. A further development during the pandemic is the public-private healthcare mix in which beds were made available between sectors when the situation requires. This chapter describes the organisation of the South African healthcare system and also, for comparison, describes how healthcare is organised elsewhere around the world.





This chapter provides an overview of the South African healthcare system explaining how key features of this system have both supported or detracted from an effective response to the Covid-19 pandemic. The South African health system may be divided broadly into four parts, three of which are governmental and one of which is private. The national, provincial, and local governments work together to deliver health service. The national government defines a national policy and oversees its implementation. The provincial government has the constitutional mandate for health services held concurrently with the national sphere. Finally, local governments have a mandate for health functions not involving clinical healthcare services, including environmental health, sanitation, and aspects of population health.

The fourth part of the health system consists of private healthcare providers and is funded by private health insurance (referred to as 'medical schemes'). This private sector is, however, also governmentally regulated, mainly through national legislation falling under the jurisdiction of the Minister of Health. All health professionals, medicines, medical products, medical devices, pharmacies, and medical schemes are regulated. A regulator, the Council for Medical Schemes, which reports to the Minister of Health, supervises medical schemes. Private hospital licensing, however, occurs at a provincial level (Figure 9.1).

The emergence of provincial governments and medical schemes as the predominant vehicles for the delivery of health services in South Africa is an outcome of the incremental interplay between the changing needs of the population and policy over a period of 200 years. The present institutional context is, consequently, quite entrenched.

Financing the health system

The public health system can be divided into five elements: general government (national and provincial); local authorities; the health system of the national defence force; social insurance arrangements (compensation for occupational injuries and diseases, compensation for occupational diseases affecting mineworkers, and the Road Accident Fund); and subsidies to medical scheme members. The focus of this section is on the main elements: the financing of publicly delivered services through national, provincial and local government structures; and the private health system funded by medical schemes.

The Constitution broadly establishes a multi-level general government system, with significant autonomy allocated to the three spheres of Government. While the system is subject to continuous legislative development, which influences the distribution of functions and the relative degrees of autonomy, broadly speaking the financial architecture of the South African public system corresponds to what is termed 'fiscal federalism'.

The bulk of government revenue is raised through national taxes and allocated to national, provincial and local government through the Division of Revenue Act (DORA). The allocations to national departments by the National Legislature take the form of voted budget allocations. The voted allocations to both provincial and local governments, however, become revenue for these structures. Their legislative structures subsequently vote on final allocations, taking account of both their own revenue sources and that derived from national government. (See Figure 9.2 for an illustration of the flows).

Transfers from national government take two basic forms: a formula-based unallocated block grant, which provides general revenue to both provincial and local authorities; and conditional allocations, which, where required, seek to achieve convergence between national, provincial and local governments. These allocations and the relevant conditions are specified in the DORA each year. Provincial governments, in particular the health function, provide subsidies to local authorities to render services falling within the functional responsibilities of the province.

In this system, each sphere of government is able to receive funds as revenue from their own taxes, user fees and inter-governmental transfers. While revenue transfers can technically go in any direction, to date they tend to flow from the higher sphere to lower spheres.

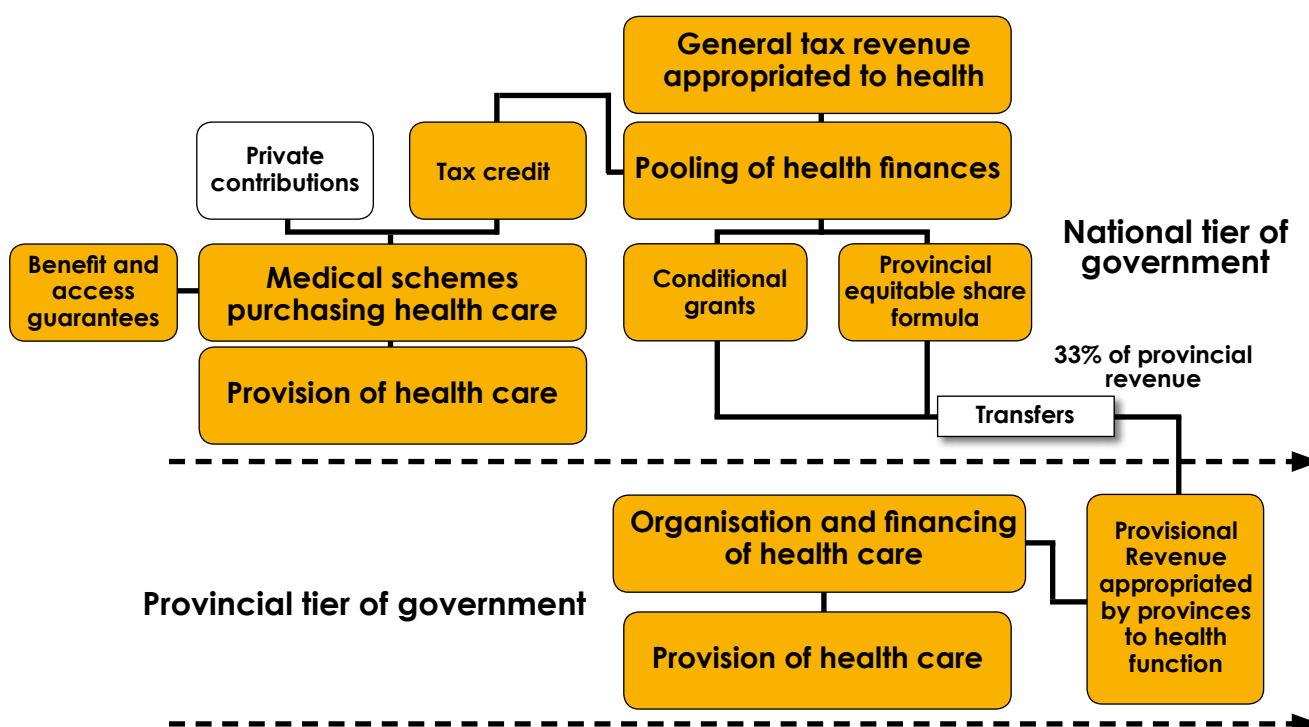


Figure 9.1: High-level overview of South Africa's present universal health coverage framework.
Credit: Alex van den Heever

The distribution of national government expenditure is heavily weighted to national government and the provinces, which was at 47.7% and 43.3%, respectively, in 2018. Local government only received around 9% in 2018, with most of their budgets financed through their own taxes, utility fees and transfers from provincial governments.

For provinces, the formula-allocated unconditional provincial equitable share grant (PES) accounts for the bulk of their revenue, which was 82.4% of the national allocation in 2018. Conditional grants, the largest share of which are for health functions, stood at 17.6% of their nationally sourced revenue in 2018. Overall, the national allocation to provinces came to R571 billion in 2018.

National revenue flowing to local government is made up of three transfers: the unallocated local government equitable share grant (53.0% in 2018); conditional grants (much of which is for the health function) (36.5% in 2018); and a distribution of the revenue raised from the fuel levy (10.5% in 2018). In 2018, the overall allocation to local governments from national government amounted to R118.5 billion.

The largest conditional grants relating to the health function for expenditure in 2018 were the Comprehensive HIV, AIDS and Tuberculosis Grant at R19.9 billion; the National Tertiary Services Grant (NTSG) at R12.4 billion; and the Health Professions

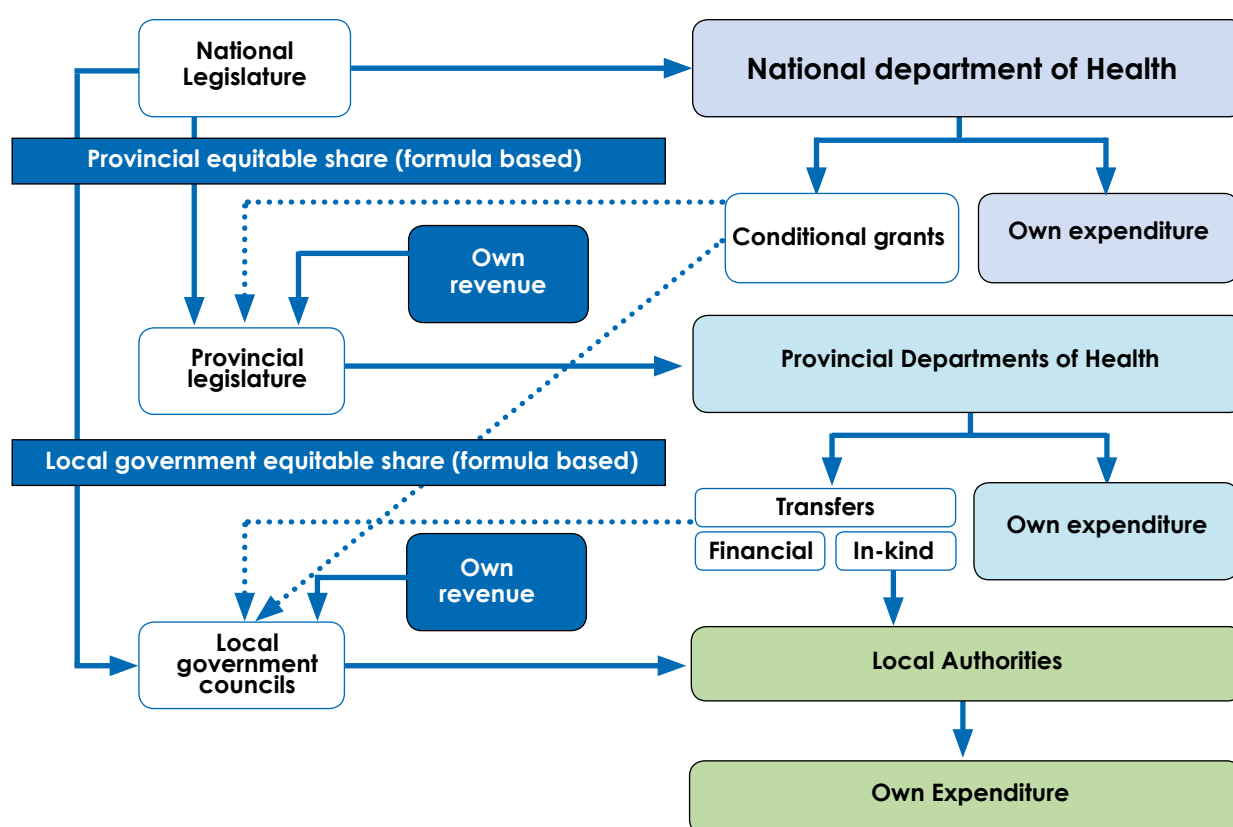


Figure 9.2: Organisation of public health financial flows—revenue and expenditure.

Credit: Alex van den Heever



Training and Development Grant (HPTDG) at R2.8 billion. Capital transfers in 2018 for the Health Facilities Revitalisation Grant involved an additional R5.8 billion. In total, health conditional grants in 2018 came to R35.3 billion.

Two conditional grants are of particular importance for the provinces of Gauteng and the Western Cape. These are: the NTSG, which theoretically funds cross-boundary flows from other provinces for the use of highly specialised services concentrated in these provinces; and the HPTDG, which theoretically funds the additional costs to the health service for the teaching and research functions carried out by academic complexes concentrated in these provinces. In the absence of these grants, both these provinces would be unable to sustain their more complex services and educational functions.

The relationship between these grants and the services they are supposed to fund has never been built into the funding model and both the provincial and national departments appear to lack the capacity to properly negotiate the values and specificity of the grants. Despite numerous reviews by the Financial and Fiscal Commission, culminating in a published report in 2006 (van den Heever, Nthite, & Khumalo, 2006), no changes have been made to the grant designs. Due to the failure to adjust these grants, or provinces to properly negotiate their value, both the Western Cape and Gauteng are likely to face growing financial constraints in maintaining their highly specialised services over the next ten years.

The public-private mix

When expressed as a percentage of Gross Domestic Product (GDP), public and private health system expenditures have remained relatively stable over a long period. However, both the public health systems and medical schemes saw a structural increase from 2.8% and 3.2%, respectively, in 2000 to 3.9% and 3.9%, respectively, in 2018. Out-of-pocket expenditure, at least as reflected by the World Health Organisation, stood at an estimated 0.6% of GDP in 2014 (World Health Organisation, 1995 to 2014), which is fairly good by international standards.

While the expenditure trends have remained stable and rising, the populations served by the two systems have not. Dramatic cost increases in the medical schemes system appear to have constrained increases to below overall population increase (a drop from 19.8% of the total population in the late 1990s to around 16% at present), with the public sector catchment population increasing slightly faster. By 2018 the public sector needed to protect 48 million people while medical schemes offered coverage to 8.9 million people (Table 9.1).

While the amount spent on the private sector via medical schemes has remained fairly constant (as a percentage of GDP) over time, there has been a dramatic shift in hospital services away from the public sector.

Until 1986, most people covered by medical schemes purchased their hospital services from the public sector, as higher-income groups and medical scheme members have always needed to pay for public hospital services. From 1986 to 2010, the number of private acute hospital beds in the private sector increased from 6,125 to 31,067, while beds in the public sector declined from 117,842 to 88,920 (Table 9.2). In the period after 2000, the public sector explicitly de-prioritised hospital-based services in favour of primary care or district health services. Within the public health budget, there has also been a substantial diversion of resources to HIV and AIDS funding.

Table 9.1: Health expenditure in South Africa from 2000 to 2018

	2000	2005	2010	2015	2016	2017	2018
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Public health compared to medical schemes expenditure (2018 prices)

Public health	75 913	102 094	157 255	183 090	185 529	191 167	197 142
Medical schemes	84 471	119 915	154 792	178 423	181 462	189 384	193 332
Total	160 384	222 009	312 047	361 513	366 991	380 551	390 475

Catchment populations for the public and medical schemes sectors

Public health	32 119	36 140	39 566	44 555	45 648	46 832	48 030
Medical schemes	6 454	6 836	8 316	8 792	8 865	8 872	8 891
Total	38 573	42 976	47 882	53 347	54 513	55 704	56 922

Public health compared to medical schemes expenditure: % of GDP

Public health	2.8%	3.0%	3.7%	3.8%	3.8%	3.9%	3.9%
Medical schemes	3.2%	3.5%	3.6%	3.7%	3.7%	3.9%	3.9%
Total	6.0%	6.5%	7.4%	7.5%	7.5%	7.8%	7.8%

Public health compared to medical schemes expenditure: Per capita (2018 prices)

Public health	2 364	2 825	3 975	4 109	4 064	4 082	4 105
Medical schemes	13 087	17 543	18 614	20 293	20 470	21 346	21 744
National average	4 158	5 166	6 517	6 777	6 732	6 832	6 860

Source: Alex van den Heever

The South African hospital system

The public sector presently has 86,579 usable beds, down from the 88,920 beds in 2010, as shown in Table 9.2. Of these, 30,265 are district hospital beds; 9,086 are central (academic) hospital beds; 5,810 are provincial tertiary hospital beds; and 24,096 are regional hospital beds (see Table 9.3 for the public hospital definitions). Overall, this implies a bed to 1,000 population ratio (public sector) of 1.8. This is not too far off from (national) country comparators such as Chile (2.1), Brazil (2.3), United Kingdom (2.6), with most countries also showing a downward trend over time. It is, however, significantly lower than the ratio of 4.4, corresponding to the private sector medical schemes population.

Table 9.2: Private and public hospital and bed estimates (from 1976 to 2010)

YEAR	PRIVATE		PUBLIC	
	Hospitals	Beds	Hospitals	Beds
1976	25	2,346		
1986	65	6,125 (est)		117,842 (est)
1989	101	10,936		
1998	162	20,908	343	107,634
2010	216	31,067	410	88,920

Source: Alex van den Heever, 2012

Strategic decisions regarding the direction of public hospital beds are made by provinces and are subject to their specific constraints without regard to an explicit national policy framework. Although it would be possible for national government, via the National Department of Health, to use conditional grant allocations to achieve such an alignment, options along these lines have not been exercised to date, despite recommendations to do so by the Financial and Fiscal Commission (van den Heever et al., 2006).

Table 9.3: Public sector hospital types

Hospital type	Description
Central hospitals (academic)	Hospitals with teaching responsibilities containing a high concentration of subspecialist services. These hospitals serve populations beyond the province in which they are located.
Provincial tertiary hospitals	Hospitals with little or no teaching responsibilities that contain subspecialist services, but which only serve the province in which they are located and can draw patients from the entire province.
Regional hospitals	Hospitals with a strong focus on general specialisations such as obstetrics and gynaecology, paediatrics, and orthopaedics and only serve the provinces in which they are located.
Psychiatric hospitals (acute)	Acute psychiatric hospitals offer specialised psychiatric care beyond the provinces in which they are located.
Specialised hospitals	Include mainly rehabilitation and infectious disease hospitals.
Tuberculosis (TB) hospitals	Due to the high incidence of TB in South Africa, the public system offers an extensive system of TB hospitals. While the principal focus is on ordinary TB cases, they must increasingly cater for various forms of drug resistant TB.
Specialised chronic hospitals	Long-term chronic psychiatric care has typically been offered in either public facilities or contracted private facilities.

Source: Alex van den Heever

Although some private hospitals are specialised (e.g. maternity, psychiatric, day, etc.), many are general hospitals with a mix of specialisations available. Data on private hospitals is, however, not routinely published by either the public or private sector, with information often available only from unverifiable proprietary data sources. However, data is available on request from various hospital groups and associations. Based on these sources, a dataset has been compiled by the author. The estimates for 2016 (and broadly consistent with 2020) by bed type are provided in Figure 9.4.

Hospital systems response to the COVID-19 pandemic

An important concern with respect to the COVID-19 outbreak in South Africa was whether the hospital system as a whole could accommodate the peak demand for critical care beds. By the time the first cases were detected in South Africa in March 2020, it had become clear that a consistent proportion of infected individuals become so severely ill that they require access to critical care services. In particular, a need arises for intensive nurse supervision, oxygen, and, in case of further deterioration, ventilation. Ventilation is typically only available to intensive care unit (ICU) beds. The ICU bed count, therefore, serves as an approximate proxy for the availability of ventilators.

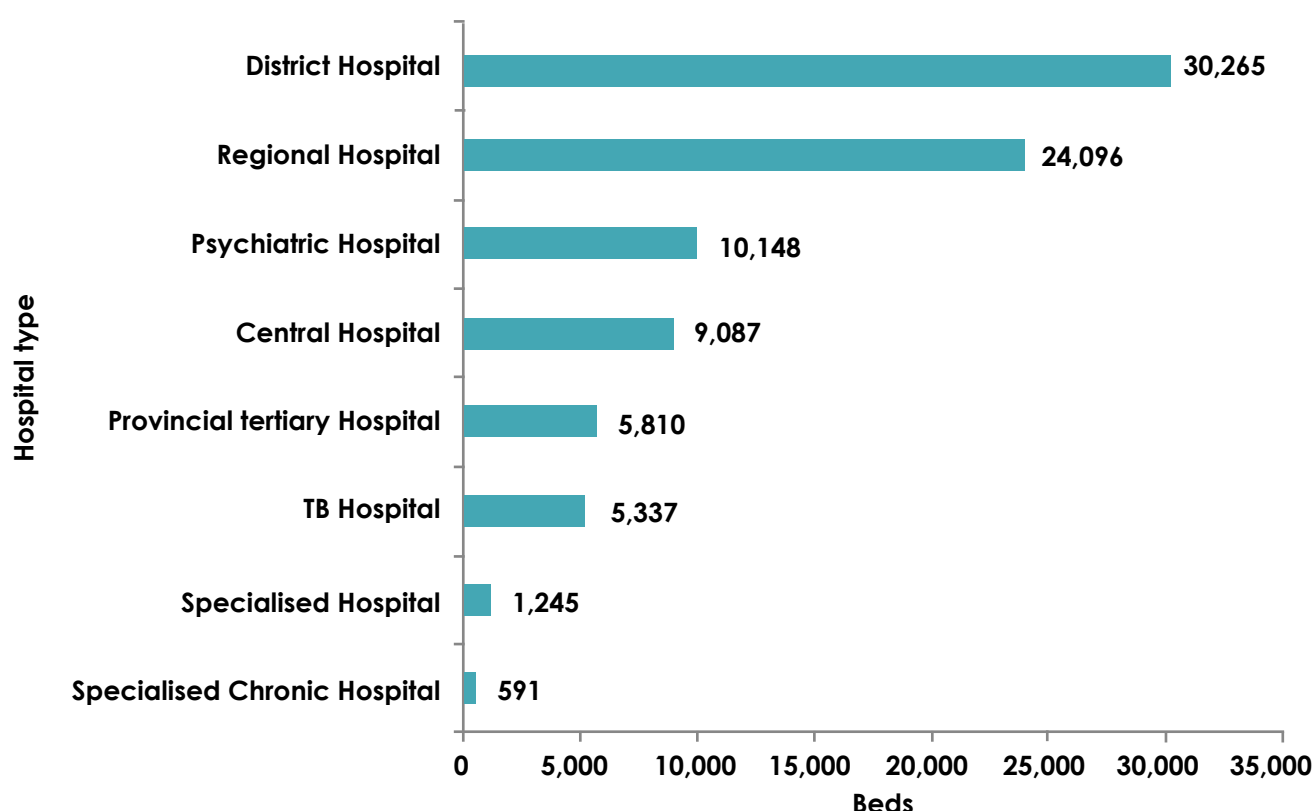


Figure 9.3: Public hospital beds by type of facility—usable beds in 2013

Source: Based on (National Department of Health, 2013). Credit: Alex van den Heever

While South Africa's overall bed levels appeared sufficient to cope with less severe admissions, it was initially unclear whether sufficient critical care beds, and especially ventilators, would be available to cope with peak demand.

Without accounting for occupancy for non-Covid-19 cases, at the beginning of the outbreak in March 2020, South Africa had roughly 93,295 acute care beds available in private acute care facilities (41,954) and in public regional, tertiary, and academic hospitals (51,341). The total number of ICU beds (i.e., those potentially with ventilators) stood at 3,318, with 2,140 in the private sector and 1,178 in the public sector. High care beds, which have similar nurse intensity to ICU beds and access to oxygen but not necessarily ventilators, stood at around 2,722 in March 2020, with 1,640 in the private sector and 1,082 in the public sector (Table 9.5).

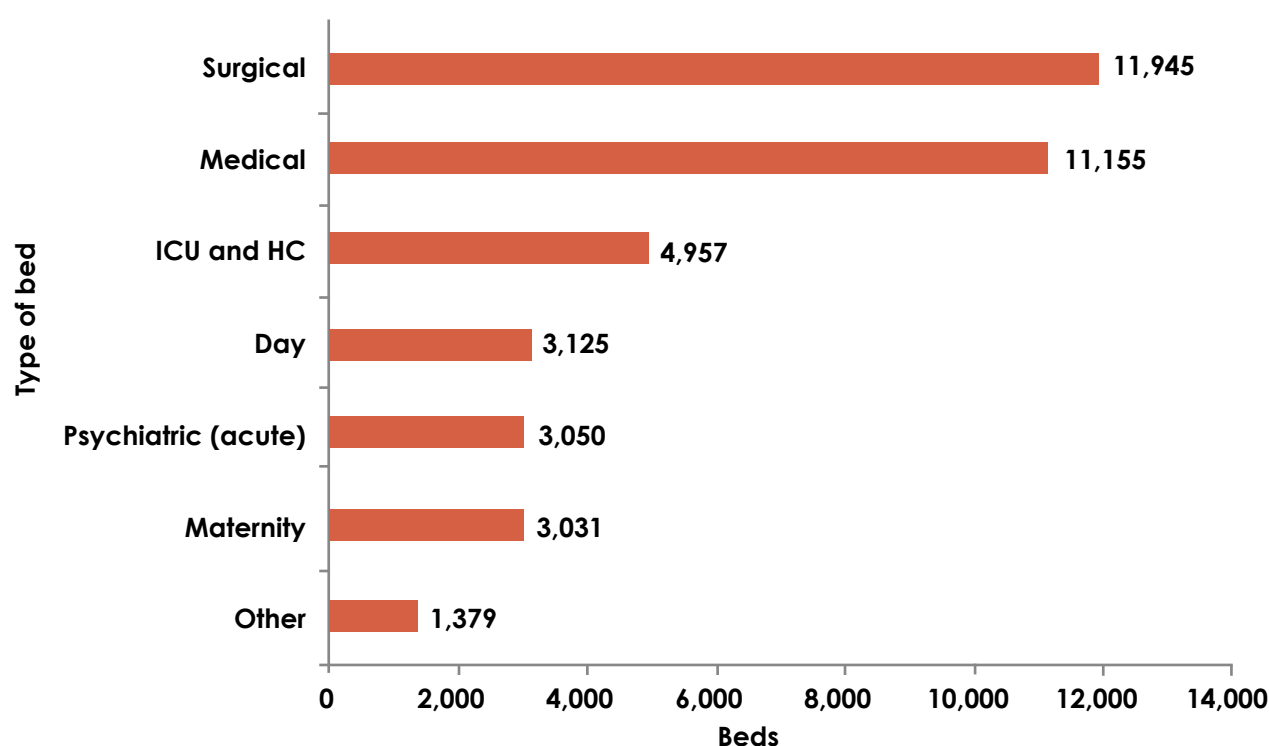


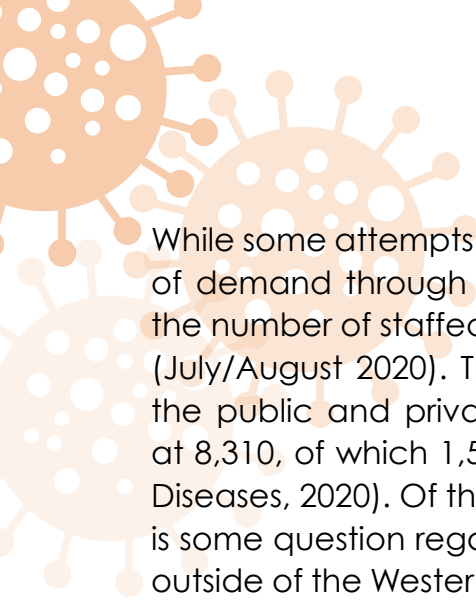
Figure 9.4: Private sector hospital beds by bed type (2016 estimate)

Source: Alex van den Heever, 2018

Table 9.5: Acute bed availability in the South African health system in March 2020

Sector	Province	Acute beds	Total critical care	ICU beds	HC beds
Private	EC	2 145	159	93	66
	FS	2 708	310	114	196
	GP	18 094	1 871	1 132	739
	KZN	6 152	516	305	211
	LP	741	44	28	16
	MP	1 846	97	63	34
	NC	918	34	27	7
	NW	2 230	197	87	110
	WC	7 119	552	291	261
Private Total		41 954	3 780	2 140	1 640
Public (regional, tertiary and academic)	EC	6 029	241	110	131
	FS	3 394	184	109	75
	GT	13 170	819	330	489
	KZ	13 097	386	273	113
	LP	3 501	69	34	35
	MP	1 579	51	25	26
	NC	929	34	21	13
	NW	3 251	81	54	27
	WC	6 391	395	222	173
Public Total		51 341	2 260	1 178	1 082
Grand Total		93 295	6 040	3 318	2 722

Source: Data from (National Department of Health, 2013; Alex van den Heever, 2018)



While some attempts were made to expand capacity to deal with the peak periods of demand through the construction of field hospitals, there is no evidence that the number of staffed beds changed significantly during the peak demand periods (July/August 2020). The highest recorded number of Covid-19 admissions to both the public and private sectors occurred on 1 August 2020, with total admissions at 8,310, of which 1,520 required critical care (National Institute of Communicable Diseases, 2020). Of those requiring critical care, 799 required ventilation. While there is some question regarding the accuracy of Covid-19 admissions in public hospitals outside of the Western Cape and the private sector, these numbers appear broadly consistent with the tracked new infections. Total Covid-19 admissions, therefore, never exceeded the combined capacity of the public and private systems, even after accounting for non-Covid-19 occupancy. Many hospitals in both the public and private sectors cancelled elective surgery from April through to August to ensure that critical care beds would be available for Covid-19 patients.

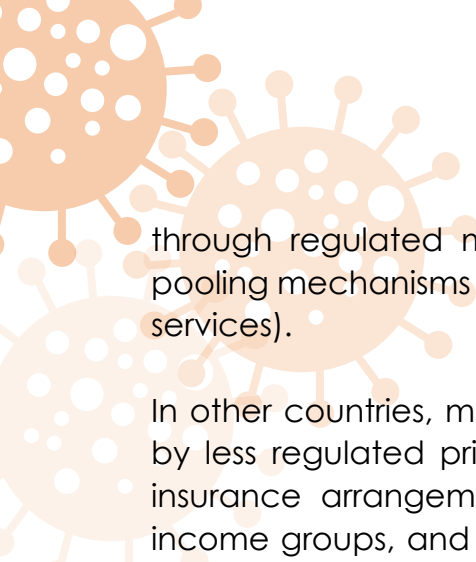
Out of all the provinces, only the Western Cape entered into an agreement with the private sector to access critical care beds if required. Ultimately, the agreement was not required as access to oxygen was expanded within the public sector and only a small number of public patients accessed private beds in the Western Cape.

Comparative healthcare systems

Having described the current healthcare system in South Africa, we now turn to describing briefly some of the different ways in which healthcare is organised elsewhere around the world.

Most of Europe, the United Kingdom, Canada, and a number of other countries have what is often described as ‘universal healthcare’, where everybody is able to access more or less the same services without distinction. The precise details of the organisation differ considerably from country to country, but the end result is much the same. The United Kingdom, for example, has a general tax-funded system, where doctors and hospitals are reimbursed directly for their services by local trusts (government organised decentralised purchasing units) using funds raised through taxes. In France, as another example, doctors and hospitals are in part reimbursed through the government, or the *Sécurité Sociale*, and in part by supplemental insurance whose terms are largely defined by legislation, with minimal co-payments by the patient. The system is set up so that everyone receives largely the same basic coverage. The organisation of services (often referred to as purchasing) is organised largely at local levels. In Germany, the Netherlands and Belgium, purchasing occurs

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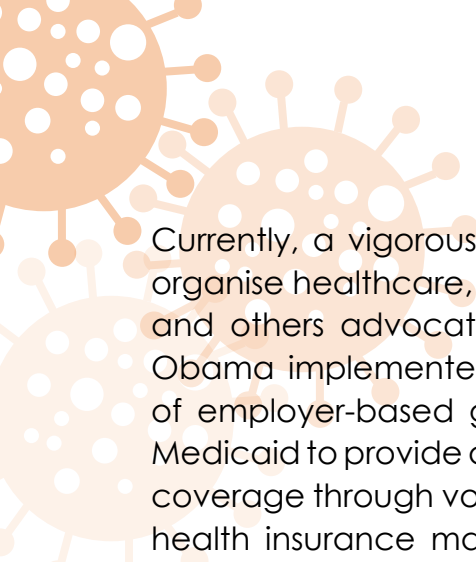
through regulated markets by private mutual funds supported by government pooling mechanisms (to account for differences in income and the need for health services).

In other countries, most notably the United States, healthcare is largely organised by less regulated private markets for insurance and healthcare provision. Social insurance arrangements involve Medicare, which provides healthcare to low-income groups, and Medicaid, which provides coverage to people over the age of 65. For people falling outside of the means test for Medicare and below the age of 65, coverage is precarious if not part of a group health insurance arrangement offered through an employer. The end result is highly unequal access to healthcare and, also, substantial inequality in quality of the healthcare received. While the United States leads the world by far in spending per capita on healthcare, the indicators of the results do not lead the world. For example, infant mortality (defined as dying before the age of one year) is 5.9 per 1000 live births in the US, whereas the corresponding figures for a sampling of other countries are as follows: 2.2 in Japan; 3.1 in Germany; 3.3 in France; 11.65 in China; 38 in South Africa; and 76 in Nigeria.

Life expectancy provides another useful performance indicator. Here are some numbers from a few selected countries:

Hong Kong	84.7
Japan	84.5
Italy	83.6
France	82.5
UK	81.2
Costa Rica	80.1
US	78.9
Cuba	78.6
Mexico	75.0
China	72.9
Russia	72.4
Rwanda	68.7
India	69.4
Senegal	67.7
South Africa	63.9
Zimbabwe	61.2
Nigeria	54.3
Central African Republic	52.8

Source: United Nations



Currently, a vigorous debate is taking place in the United States on how best to organise healthcare, with some advocating a system closer to the European model and others advocating maintaining the status quo. Former US President Barack Obama implemented reforms, expanding coverage to individuals falling outside of employer-based group coverage. The current debate centres on expanding Medicaid to provide default coverage for people unable to access proper insurance coverage through voluntary health insurance arrangements. Unregulated voluntary health insurance markets structurally fail to provide proper coverage to people with pre-existing medical conditions and those with inadequate incomes. Opposition to an expansion of Medicaid comes from private commercial health insurers, who would lose significant business to public coverage. Healthcare was one of the key issues of the 2020 US presidential election.

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how to organise
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Many third world countries have a hybrid system with a minimal public offering for the majority at no or minimal charge, and another parallel private system for the middle and upper classes, which is financed by insurance premiums for those who can afford them.

Throughout the world, how to organise healthcare will continue to be a vigorous subject of debate. As a general trend, healthcare costs are rising faster than inflation as new treatments are becoming available. Another challenge is the inequality with urban and rural areas, which have a lack of doctors and less advanced care.

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