Chapter 4
Health Resources

Health resources (hospitals, doctors nurses, and other health professionals) are in noticeable scarcity in African countries. According to the target set by the World Health Organization (WHO), there should be at least two hospitals per 100,000 inhabitants, and 20 doctors per 100,000 inhabitants. Most countries studied in this book achieve the target of having at least two hospitals per 100,000 population, but only nationally not regionally. Most health resources are concentrated in the urban areas, leaving the rural areas less accessible to the resources. Furthermore, healthcare in most countries is divided into private and public. Public healthcare is often funded by the government and offered to all citizens, and private healthcare facilities are used mostly by people with more access to funds. In countries in North Africa, where the government provides a stronger healthcare budget, the healthcare facilities are mainly run publicly rendering less financial burden on patients. While in other countries, public hospitals are often less funded and more crowded, many patients with more sufficient financial ability would seek treatment through private hospitals. The loss of healthcare professional personnel is also a crucial issue existing in the healthcare system in Africa. South Africa reported an increasing resignation trend in the medical professions between 2011 and 2015 due to unsatisfactory salary and working conditions in the public hospitals, where they received their medical training after graduation. After resignation, these professionals often relocate themselves to private sectors, other provinces, or abroad, causing a lack of providers in the public sector. This chapter aims at investigating this phenomenon, as well as the reasons behind it, such as the lack of medical students, brain drain in the health professions, and the lack of resources to support people receiving higher education.

4.1   Hospital Distribution

Health center density reflects the number of health centers relative to population size. It is an effective indicator of patients' physical accessibility to outpatient healthcare services. The target set by WHO is two health facilities per 100,000 inhabitants. The countries studied in this report have achieved this target nationally or at least regionally. Hospital distribution is often correlated with regional population density and urbanization, which means cities with more resources tend to have more healthcare facilities and more complete healthcare systems. Therefore, hospital distribution also identifies the key healthcare regions of countries.

Côte d'Ivoire measures its health system capacity using the hospital distribution (Fig. 4.1) or the number of energy-saving performance contracts (ESPCs) of healthcare facilities per 10,000 population, rather than the density of facilities (Fig. 4.2).

The data collected considers primary healthcare or first-contact healthcare facilities as level-2 facilities. The target proposed by WHO is one ESPC per 10,000 people. Côte d'Ivoire had 2,479 ESPCs in 2018. Despite a 10.08% increase of 227 ESPCs in 2017, its national ratio of one ESPC per 10,164 inhabitants remains below the WHO target (Fig. 4.2).

The national ratio of level-2 hospitals reached 0.7 in 2018, which is also below the WHO target of one ESPC per 10,000 population (Fig. 4.3).

In Ghana, the healthcare system comprises about 60% public facilities (1,625 of which are run by the government) and 40% private facilities. The Christian Health Association of Ghana has 928 private hospitals and 220 private health facilities. The Ashanti region has the most health facilities in Ghana, followed by the Greater Accra and eastern regions. The two northern regions have the least (Figs. 4.4 and 4.5).

Kenya achieved the WHO goal on a national level in 2018, when health facility density reached 2.2 per 100,000 population. However, many countries are still below this target, especially in the eastern part of the country (Fig. 4.6).

In Nigeria, healthcare services were delivered at over 40,110 health centers included on the Federal Ministry of Health's master facility list in 2020. Two-thirds of the services were publicly administered; the remaining third was run by private firms. Of the total, 88.15% were primary facilities, 11.6% offered secondary services, and 0.25% engaged in tertiary care (Fig. 4.7).

Around 73% of Nigerian hospitals and clinics are in the public sector, and 27% are private. Many have long wait times, old facilities, antiquated equipment, and shortages of health workers. Private healthcare, although more expensive, offers shorter wait times, better facilities, and superior care in terms of service delivery (Fig. 4.8).

South Africa has over 3,000 public clinics and over 470 public hospitals, as well as over 1,500 private clinics and over 260 private hospitals. Among all the provinces, Gauteng has the most healthcare facilities due to its large population and major economic activity (Fig. 4.9).

Hospital Distribution by District (2018)
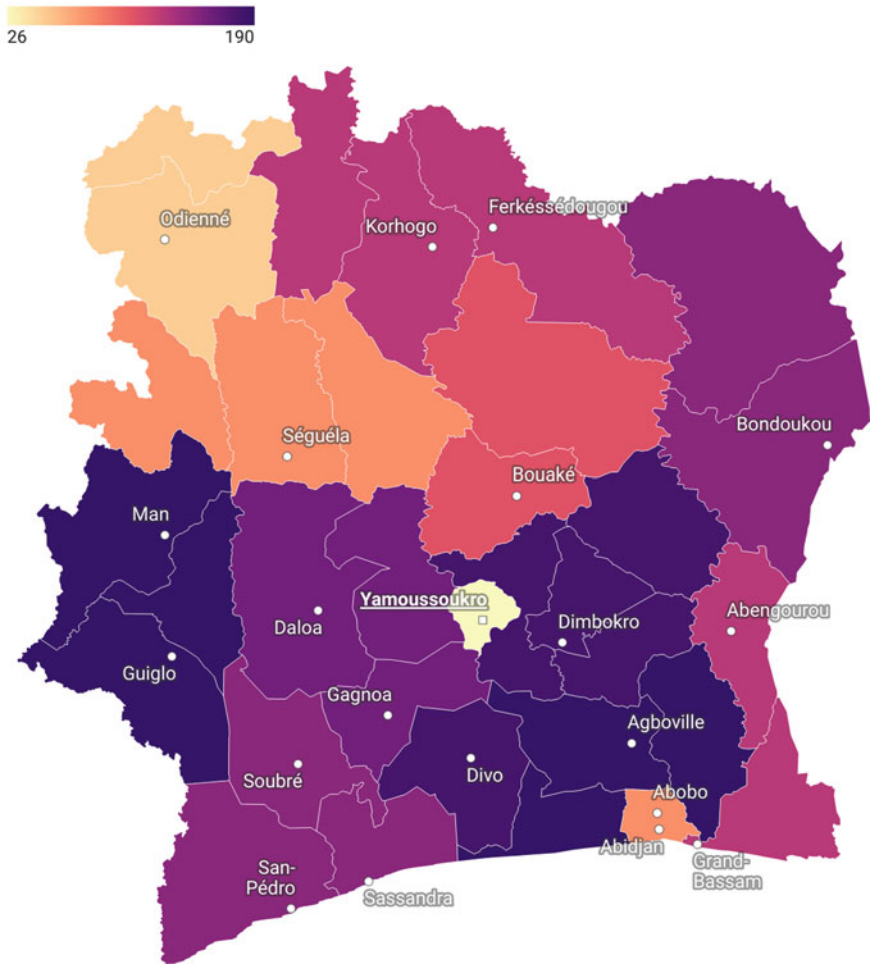
Fig. 4.1 Hospital distribution in Côte d'Ivoire, by district (2018) (*Data source* Syndicat National des Médecins Privés de Côte d'ivoire. *Map source* the author)
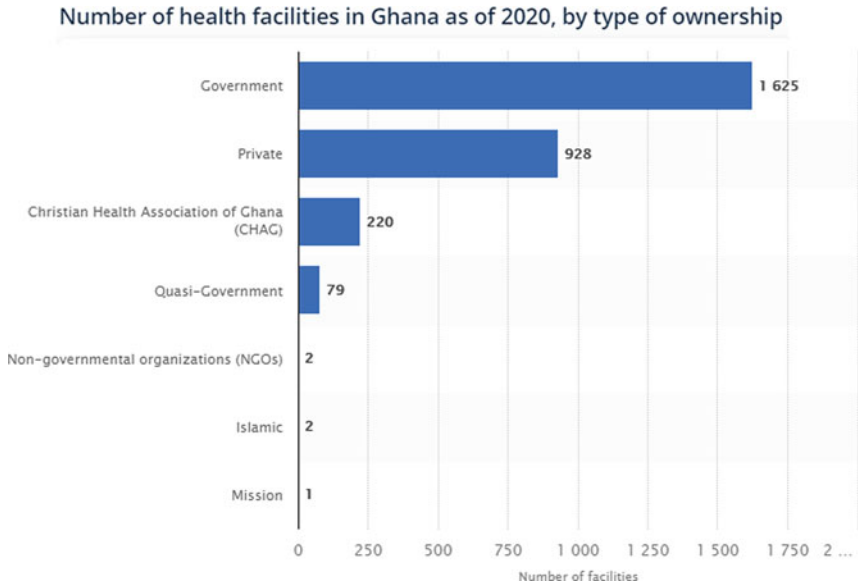
4.2 Health Provider Distribution

Health provider density reflects the number of health centers relative to a population size of 100,000. Countries with fewer than 10 doctors or 40 nurses and midwives for every 10,000 people are considered underserved.[1] As of 2020, over 55% of WHO Member States reported having less than 20 medical doctors per 10,000 inhabitants

---

[1] https://apps.who.int/iris/bitstream/handle/10665/311696/WHO-DAD-2019.1-eng.pdf?ua=1.

Fig. 4.2 Ratio of ESPCs in Côte d'Ivoire (2018) and the ratio of first-line health facilities in Côte d'Ivoire (2018) (*Data source* Syndicat National des Médecins Privés de Côte d'ivoire). *Map source* (left) the author and *Table source* (right) Syndicat National des Médecins Privés de Côte d'ivoire)

Fig. 4.3 Level-2 hospitals in Côte d'Ivoire (2018) and Level-2 hospitals in Côte d'Ivoire, by population (2018) (*Data source* Syndicat National des Médecins Privés de Côte d'ivoire) (left) the author (right) Syndicat National des Médecins Privés de Côte d'ivoire) (*Map source*)

Number of health facilities in Ghana as of 2020, by type of ownership

Fig. 4.4 Number of health facilities in Ghana in 2020, by type of ownership (*Data source* Ghana Statistical Service. *Graph source* Statista)

(almost 40 countries in the WHO African region). Africa has access to only 3% of health workers, a crucial issue in this region.

In Côte d'Ivoire, the national ratio was one healthcare provider per 7,354 inhabitants (1.4 doctors per 10,000 inhabitants) in 2018. Eight health regions (40%) reached the WHO target of one doctor per 10,000 inhabitants. Abidjan had 2.1 doctors per 10,000 inhabitants, Sud Comoé had 1.8, and Aries had 1.6 for two consecutive years. Cavally-Guémon and Gboklè-Nawa San-Pédro fell below the goal with 0.5 doctors per 10,000 inhabitants, and Poro-Tchologo-Bagoue had only 0.6 doctors per 10,000 inhabitants (Fig. 4.10).

At the national level, the WHO target of one nurse per 5,000 inhabitants has been reached with a ratio of 2.3 nurses per 5,000 inhabitants (Fig. 4.11).

The health regions of Sud Comoé (3.2 nurses per 5,000 inhabitants), Bélier (3.0 nurses per 5,000 inhabitants), and Indenie-Djuablin (2.9 nurses per 5,000 inhabitants) had the highest ratios. Cavally-Guémon and Gboklè-Nawa-San Pedro (1.3 nurses per 5,000 inhabitants) and Poro-Tchologo-Bagoue (1.4 nurses per 5,000 inhabitants) had the lowest ratios.

According to a World Bank survey conducted between 2015 and 2017, Ghana had only one doctor for every 10,450 patients, far below the WHO goal of 1:1,320. As shown in Fig. 4.12, doctors in Ghana are spread far across different regions, with much less dense coverage in the Greater Accra and Ashanti regions.

The current nurse-to-patient ratio according to the same report stands at 2.352, which exceeds the WHO's recommended one nurse-to-1,000 ratio. Figure 4.12 shows

Number of health facilities in Ghana as of 2020, by region

Region	Number of facilities
Ashanti	530
Greater Accra	438
Eastern	331
Upper East	211
Volta	210
Central	200
Western	184
Upper West	125
Bono	120
Northern	120
Western North	105
Oti	82
Bono East	70
Savannah	51
Ahafo	44
North East	36
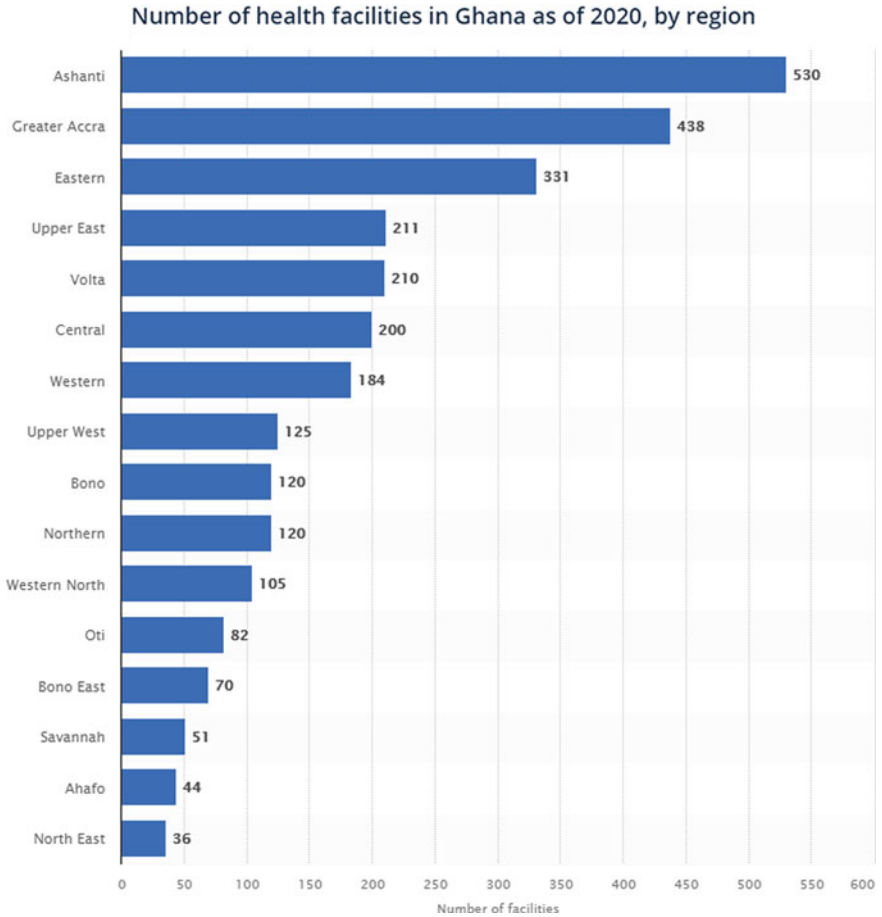
Fig. 4.5 Number of health facilities in Ghana in 2020, by region (*Data source* Ghana Statistical Service. *Graph source* Statista)

the distribution of nurses across Ghana, showing highly concentrated Volta, Eastern, Ashanti, and Western regions and less concentrated Upper East and Upper West regions.

According to a 2016 report by the Ghana Health Service, healthcare providers largely consist of nurses (37,582), physicians (3,527), and dentists (573; Fig. 4.13).

In Kenya, the physician density per 10,000 population is 0.2, nursing and midwifery personnel density is 0.8, pharmaceutical personnel density is 0.2, and other health workers' density is 0.1 (Figs. 4.14 and 4.15).

The specific density heat map is shown below.

In Nigeria, there were 75,000 doctors licensed by the Medical and Dental Council of Nigeria in 2018, but only 42,000 were practicing, leaving only one doctor for
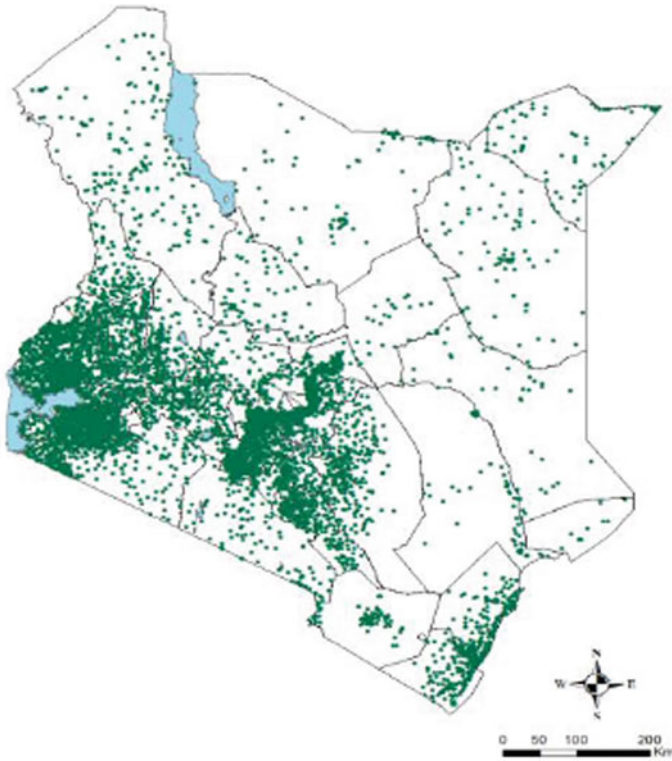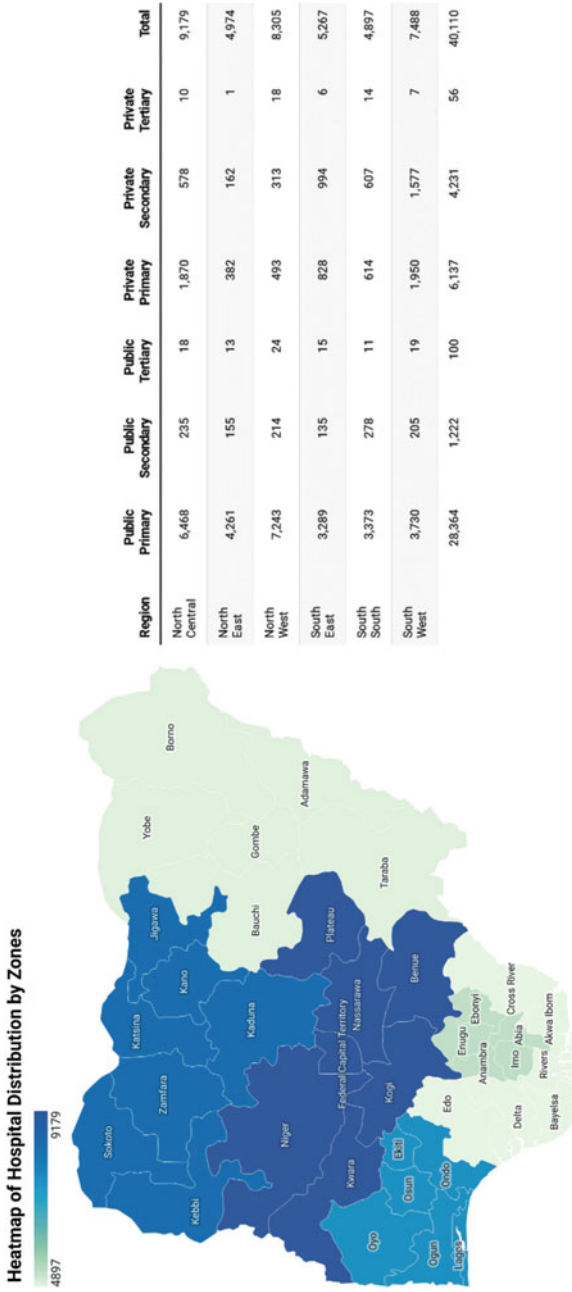
Fig. 4.6 Hospital distribution in Kenya (*Data source* Ministry of Health, Kenya. *Map source* Ministry of Health, Kenya)
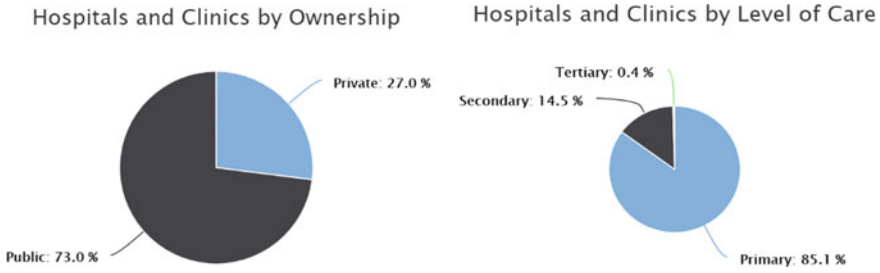
every 4,800 people. The large discrepancy between licensed and practicing doctors is predominantly because most health professionals choose to work in Lagos and other urban areas in the south, leaving an acute shortage of health professionals in the northern part of the country. Of the country's 164 universities, only 41 are accredited to teach medicine, and they cannot train personnel quickly enough to replace those that emigrate. Statistics show that approximately 2,300 medical doctors graduate each year.

The Health Professions Council of South Africa has 72,207 registered professionals on the Medical and Dental Board. Most medical officers in 2015 were men, and most of them were based in Gauteng province, with a few in the Northern Cape province (Fig. 4.16). South Africa has one public health doctor for every 2,457 people and one private-sector doctor for every 429–571 people (Fig. 4.17). Because 48% of registered nurses are over 50 years old and only 5% are under 30, South Africa may encounter a resource drain as older nurses retire (Fig. 4.18).

Heatmap of Hospital Distribution by Zones

Region	Public Primary	Public Secondary	Public Tertiary	Private Primary	Private Secondary	Private Tertiary	Total
North Central	6,468	235	18	1,870	578	10	9,179
North East	4,261	155	13	382	162	1	4,974
North West	7,243	214	24	493	313	18	8,305
South East	3,289	135	15	828	994	6	5,267
South South	3,373	278	11	614	607	14	4,897
South West	3,730	205	19	1,950	1,577	7	7,488
	28,364	1,222	100	6,137	4,231	56	40,110

Fig. 4.7 Heatmap of hospital distribution in Nigeria, by zone and Distribution of healthcare facilities in Nigeria, by zone (*Data source* Federal Ministry of Health in Nigeria. *Table source* (left) the author (right) Ademola Olokun)

Hospitals and Clinics by Ownership   Hospitals and Clinics by Level of Care

Private: 27.0 %

Tertiary: 0.4 %

Secondary: 14.5 %

Public: 73.0 %

Primary: 85.1 %

Fig. 4.8 Hospitals and clinics in Nigeria, by ownership and by the level of care (*Data source* Federal Ministry of Health in Nigeria. *Table source* Ademola Olokun)

Province	Public clinic	Public hospital	Private clinic	Private hospital	Community Health Centre	Total
Gauteng	329	44	657	95	32	1157
Eastern Cape	732	101	102	22	37	994
KwaZulu-Natal	609	79	233	46	22	989
Western Cape	194	77	347	42	9	669
Limpopo	453	42	90	14	26	625
Mpumalanga	232	32	70	13	57	404
North West	256	31	56	16	45	404
Free State	209	34	64	18	9	334
Northern Cape	127	38	26	10	32	233
South Africa	3141	478	1645	276	269	5809

Fig. 4.9 Public and private healthcare facility distribution in South Africa (*Data source* Department of Health, Republic of South Africa. *Table source* Funani Mpande)

The resignation trend among medical officers is also a major concern in South Africa, especially in Western Cape. In 2015, Western Cape had the highest number (729) of medical officer resignations, loosely followed by Eastern Cape (342). Among the 729 resignations in Western Cape, most are young people aged 40 and below, intensifying the severity of brain drain in the medical professions. The resignation of the younger staff is due to a number of reasons. In South Africa, medical training is conducted at public facilities. After training, many of the younger staff relocate to other provinces, to the private sector, or abroad. The trend of resignation, however, is insufficient to prove an increase or decrease in the number of resignations. According to the trend of resignations in Limpopo, Free State, and North West, which are the provinces with the least number of resignations, only Limpopo shows an increase between 2013 and 2015, while the other two stayed steady. (African Institute for Health and Leadership Development 2017; Figs. 4.19 and 4.20).
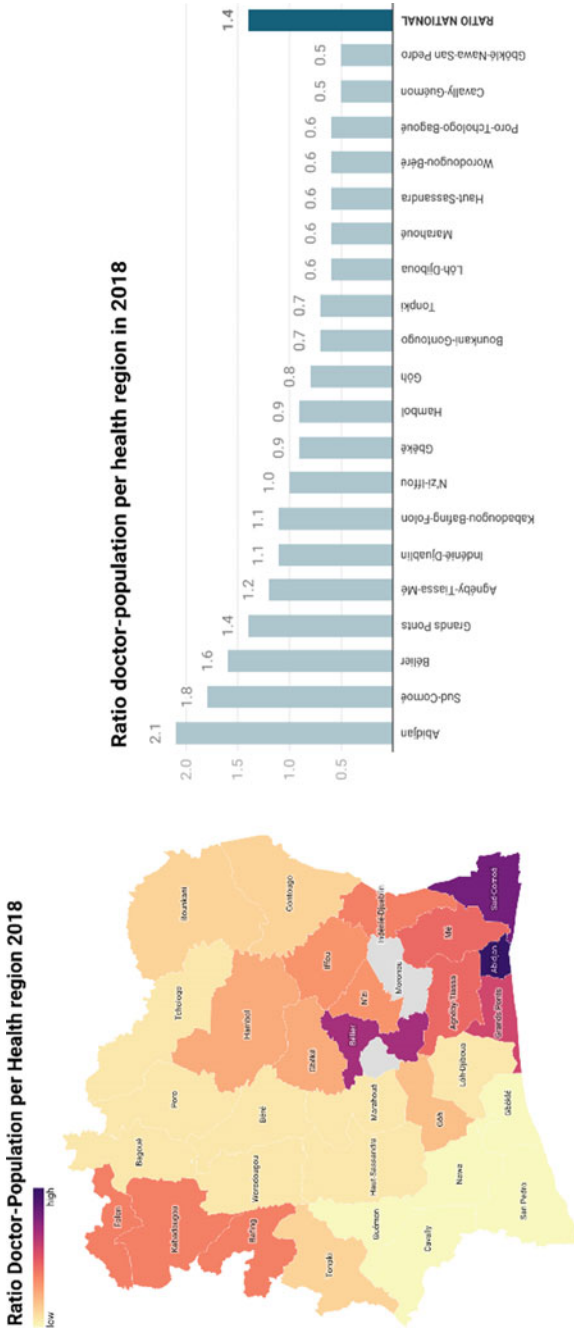
Fig. 4.10 Ratio of doctors to population in Côte d'Ivoire, 2018 (*Data source* Syndicat National des Médecins Privés de Côte d'ivoire. *Map source* (left) the author (right) Syndicat National des Médecins Privés de Côte d'ivoire)
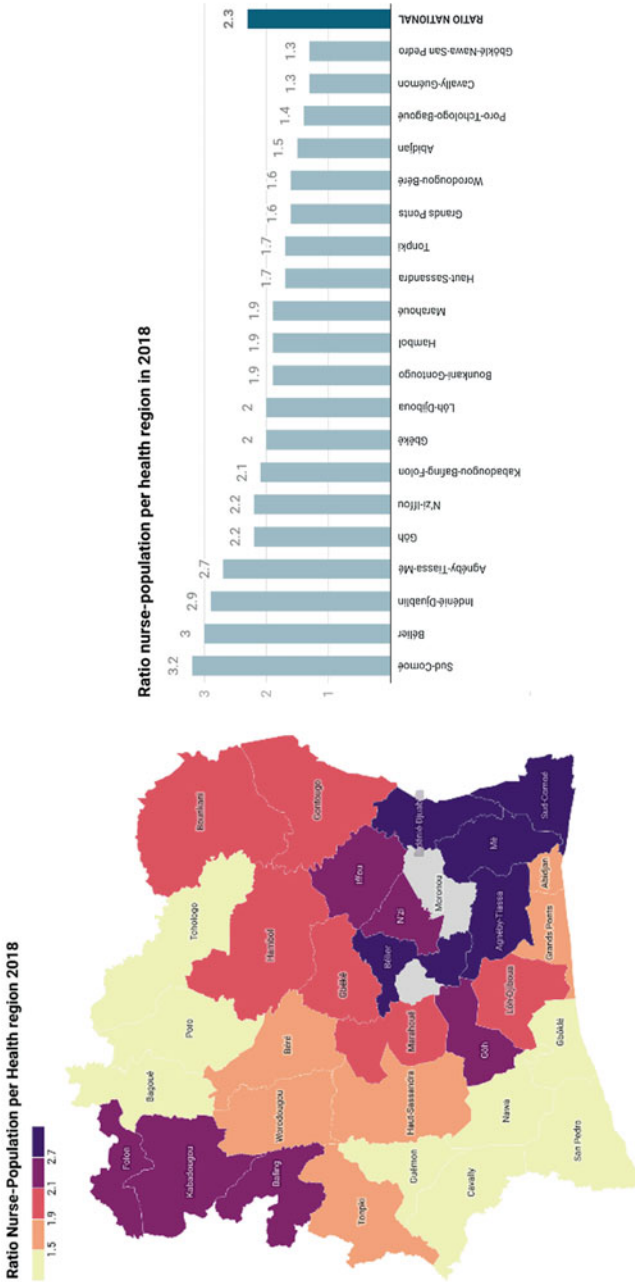
Fig. 4.11 The ratio of nurses to the population in Côte d'Ivoire, 2018 (*Data source* Syndicat National des Médecins Privés de Côte d'ivoire. *Map source* (left) the author (right) Syndicat National des Médecins Privésde Côte d'ivoire)
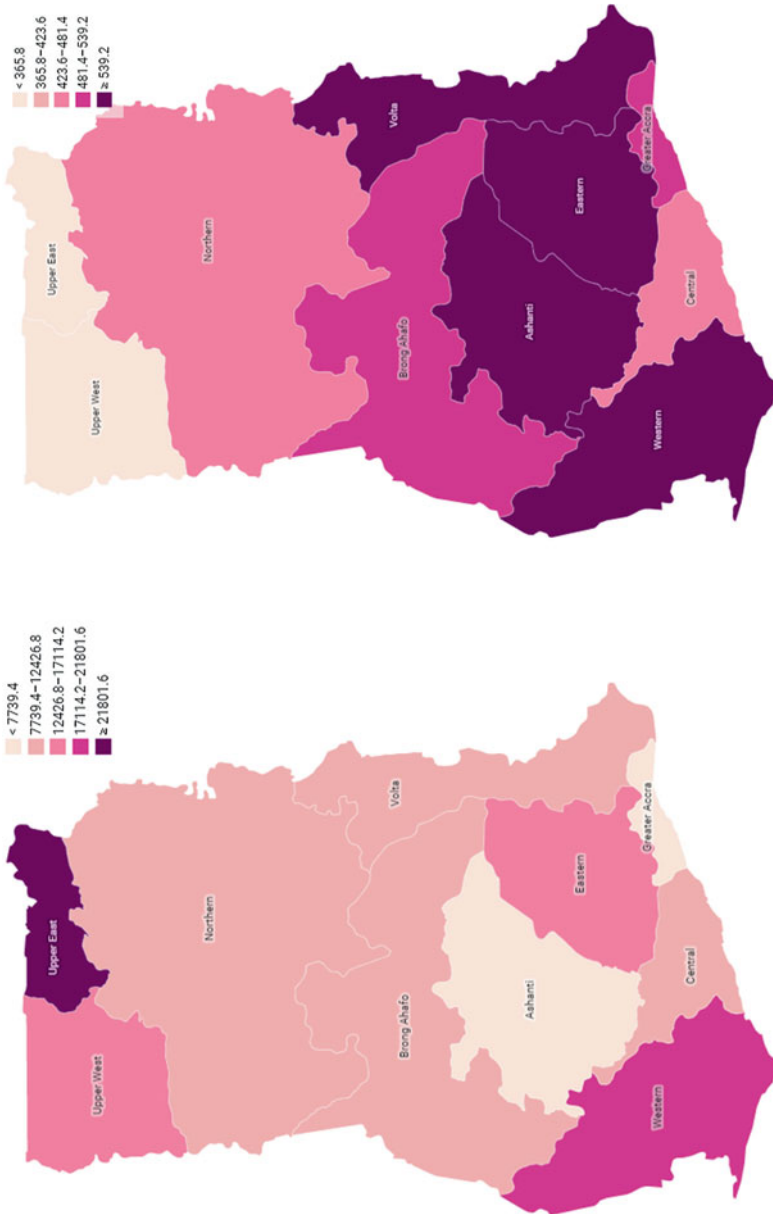
Fig. 4.12 Distribution of doctor (left) and nurse (right) coverage in Ghana (2017) (*Data source* World Bank. *Map source* the author)

Healthcare Personnels (2016)

Physicians
(3,527)

Dentists
(573)

Nurses
(37,582)
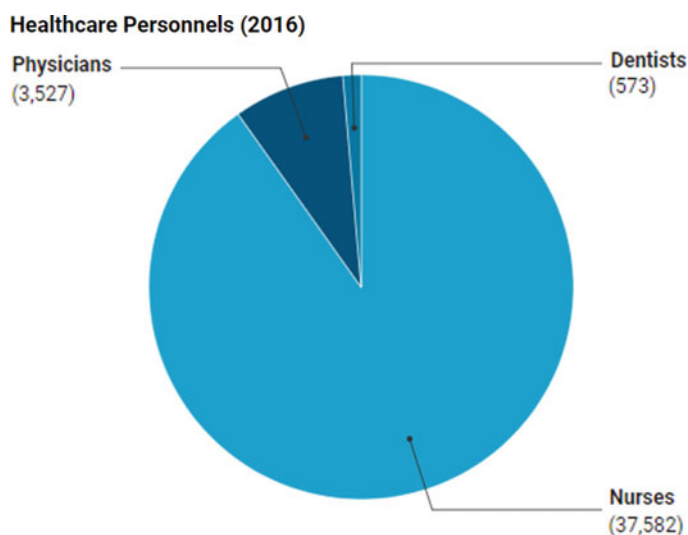
Fig. 4.13 Healthcare personnel in Ghana (*Data source* World Bank. *Map source* The author)

	ANNUAL OUTPUT	TOTAL # REGISTERED	TOTAL # RETAINED	RATIO PER 10,000 POP	DENSITY 1: N POP	DENSITY 1: N POP
				POP ESTIMATE: THE 2009 KENYA POPULATION AND HOUSING CENSUS	POP ESTIMATE: THE 2009 KENYA POPULATION AND HOUSING CENSUS	*POPULATION IN "WORLDOMETERS"
MEDICAL OFFICERS	611	9,497	5,660	1.5	1: 6,822	1: 7,516
DENTISTS	52	1,066	603	0.2	1: 64,030	1: 70,548
PHARMACISTS	330	2,377	1,971	0.5	1: 19,530	1: 21,518
PHARM TECHNOLOGISTS	994	7,243	4,671	1.2	1: 8,266	1: 9,107
CLINICAL OFFICERS	1,642	13,913	10,562	2.7	1: 3,656	1: 4,028
ML TECHNOLOGISTS	1,236	6,626	5,203	1.3	1: 7,421	1: 8,177
ML TECHNICIANS	326	4,445	3,213	0.8	1: 12,017	1: 13,241
NURSES AND MIDWIVES	6,326	63,113	31,896	8.3	1: 1,211	1: 1,334
TOTAL (ALL CADRES RETAINED)			63,785	16.5	1: 605	1: 667
TOTAL ACTIVE DOCTORS, CLINICAL OFFICERS, NURSES/MIDWIVES			53,118	13.8	1:727	1: 801
WHO estimates for the number of physicians, nurses, and midwives per 1,000 population needed to meet the SDGs by 2030				44.5		

Fig. 4.14 Health worker density in Kenya (*Data source* Ministry of Health, Kenya. *Map source* Ministry of Health, Kenya)
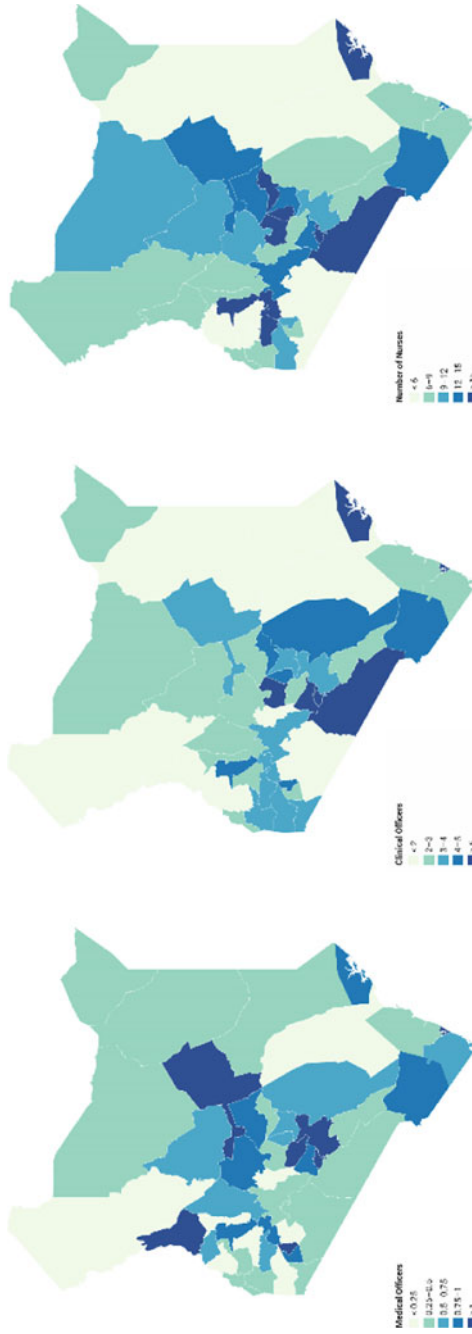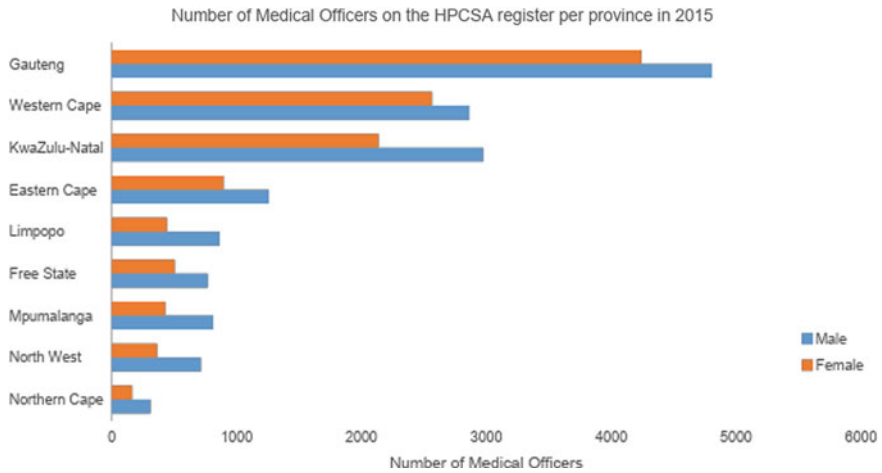
Fig. 4.15 Heat map of health worker density in Kenya (*Data source* Ministry of Health, Kenya. *Map source* The author)

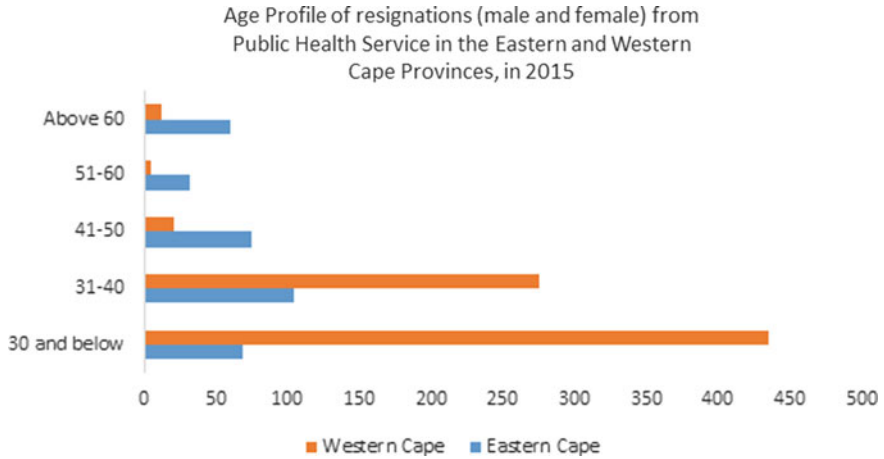**Doctors per People in South Africa for the year 2015**
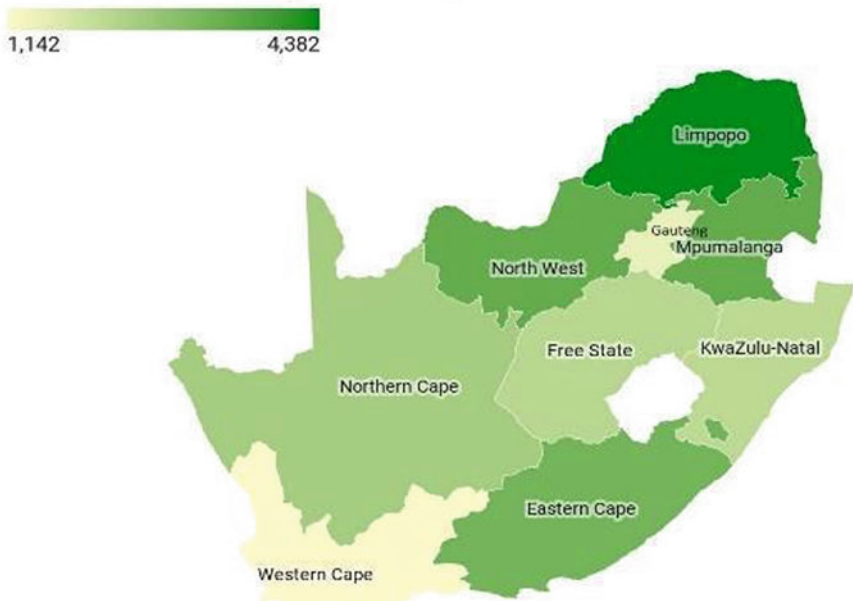
Fig. 4.16 Doctors per person in South Africa, 2015 (*Data source* Health Professions Council. *Map source* Funani Mpande)
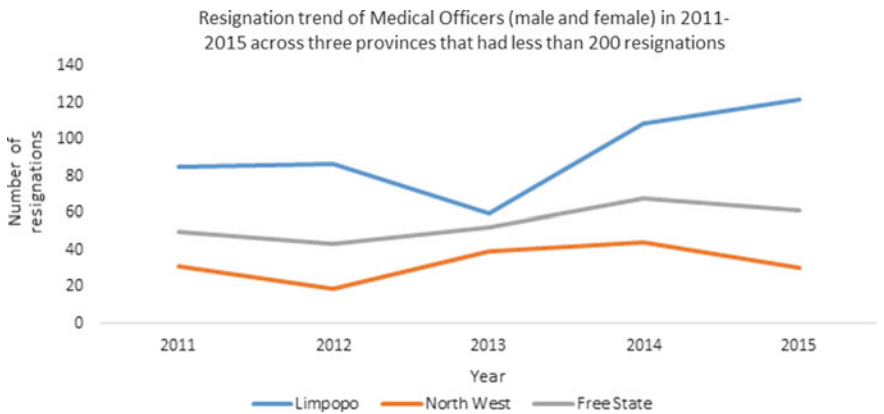

Fig. 4.17 Number of medical officers on the Health Professions Council of South Africa register in 2015, by province (*Data source* Health Professions Council. *Graph source* Funani Mpande)

Fig. 4.18 The age profile of resignations from public health service in eastern and western Cape provinces, 2015 y(*Data source* African Institute for Health and Leadership Development. *Graph source* Funani Mpande)

Fig. 4.19 Resignation trend among medical officers in three provinces in South Africa with less than 200 resignations, 2011–2015 (*Data source* Health Professions Council. *Graph source* Funani Mpande)

4.3 Summary

Algeria, Kenya, Côte d'Ivoire, Ghana, and Nigeria meet the WHO's target of hospital-to-patient ratio on the national level, but not necessarily on the regional level. All of them are lacking doctors, nurses, and other health professionals. Health resources are mostly concentrated in urban areas, especially major cities. However, even in cities

Medical officer resignations across five
provinces (male and female), in 2015

Western Cape   729

Eastern Cape   342

Limpopo   122

Free State   61

North West   30

0   100   200   300   400   500   600   700   800

Number of resignations
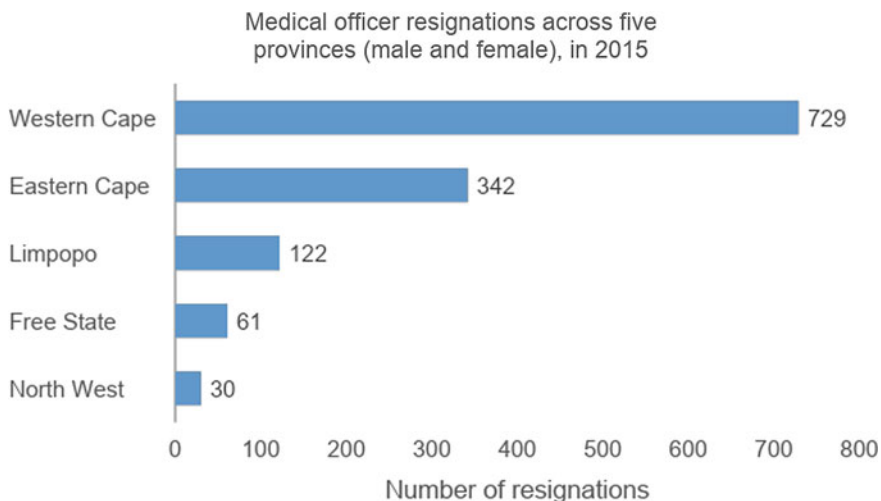
Fig. 4.20 Medical officer resignations across five provinces in South Africa, 2015 (*Data source* Health Professions Council. *Graph source* Funani Mpande)

with the most abundant healthcare resources, the standard doctor-to-patient, nurse-to-patient, and hospital-to-patient ratios set by WHO are not met. Apart from not having enough medical students, brain drain in the health professions is also a major issue. Many professionals choose to go to other countries, especially Europe and North America, for better income. Some resign early due to difficult working conditions. Unfortunately, due to data limitations, any recent changes in these numbers are not addressed in this paper. However, resources and personnel are expected to increase as local economies grow and more people receive higher education.