



# THE STATE OF THE HEALTH WORKFORCE IN THE WHO AFRICAN REGION

2021



World Health  
Organization

REGIONAL OFFICE FOR

Africa

# **THE STATE OF THE HEALTH WORKFORCE IN THE WHO AFRICA REGION**

## **SURVEY REPORT**

**WORLD HEALTH ORGANIZATION  
Universal Health Coverage/Life Course Cluster  
Brazzaville, Congo • 2021**

## The state of the health workforce in the WHO African Region, 2021

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## FOREWORD

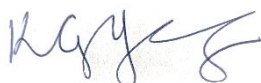
The World Health Organization acknowledges that a strong health workforce with sufficient, well-trained, equitably distributed and motivated health workers is critical to improving the health of the population, as well as ensuring the achievement of Universal Health Coverage and the unfinished agenda of the Millennium Development Goals. Despite concerted efforts at regional and global levels to strengthen the health workforce, significant challenges still exist, especially in the African Region.

In 2018, the World Health Organization Regional Office for Africa conducted a regional survey to assess the status of the health workforce in the Region. This was the second comprehensive, systematic and detailed survey to assess the status of the health workforce in the African Region, following the first one conducted in 2005. The purpose of this survey was to update the data on the health workforce in all the Member States of the African Region to measure the progress made in the implementation of the regional road map for scaling up human resources for health and to serve as a baseline assessment for measuring the progress made in the implementation of the African regional framework for the implementation of the Global Strategy on human resources for health: Workforce 2030, which was adopted in 2017 by the Regional Committee for Africa.

The country data obtained through a comprehensive questionnaire completed by the 47 African Member States included health workforce profiles, education, training and accreditation. The data also includes information on working conditions, governance and management of the health workforce, and roles and capacities of the health professional bodies.

Its findings provide updated and comprehensive information for the regional human resources for health database, as well as a regional picture of some of the basic human resources for health statistics and information by country. The information will be used to monitor progress and support evidence-based decision-making, as well as inform policy dialogue and investments needed to strengthen the health workforce. Through the Africa Health Workforce Observatory, further updates will be done regularly.

This report covers two main aspects – the health workforce profile and country profiles. It is also part of the continued effort to promote regular reporting on the health workforce situation in the Region. Feedback on this report is welcome and can be made to the Health Workforce Unit, at the Universal Health Coverage - Life Course Cluster in Brazzaville, Congo.



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## ABBREVIATIONS

<b>AHWO</b>	Africa Health Workforce Observatory
<b>CHWs</b>	Community Health Workers
<b>GSHRH</b>	Global Strategy on Human Resources for Health: Workforce 2030
<b>HRH</b>	Human Resources for Health
<b>HRIS</b>	Human Resource Information Systems
<b>HWF</b>	Health Workforce
<b>MoH</b>	Ministry of Health
<b>NHWA</b>	National Health Workforce Accounts
<b>PHC</b>	Primary Health Care
<b>SDGs</b>	Sustainable Development Goals
<b>UHC</b>	Universal Health Coverage
<b>UN</b>	United Nations
<b>WHO</b>	World Health Organization
<b>WHO AFRO</b>	World Health Organization Regional Office for Africa

# EXECUTIVE SUMMARY

## Background

The health workforce is the cornerstone of every health system and critical to the provision of quality health services, improving population health, ensuring universal health coverage and the achievement of the Sustainable Development Goals. The Global Strategy on human resources for health (HRH): Workforce 2030 emphasizes that health systems can only function well when they have sufficient well-trained, competent, responsive, motivated, productive and equitably distributed health staff. In 2017, building on the Road map for scaling up HRH for improved health service delivery in the African Region 2012–2025 that was adopted by the Sixty-second session of the Regional Committee, the African regional framework for the implementation of the Global Strategy on HRH was developed. Ministers of health adopted the framework as a regional blueprint for providing contextual guidance, milestones and targets to the efforts of Member States in operationalizing the global strategy by making adequate investments to enable the implementation of effective policies that ensure the universal availability, accessibility and quality of the health workforce.

After data collection for the survey was completed, and before analysis, the COVID-19 pandemic was declared. The African Region had largely been thought to be less affected by the COVID-19 pandemic than other areas of the world, in terms of the number of confirmed cases, the severity of the cases and reported mortalities. Nevertheless, more than 3 million people had been infected with COVID-19 in the WHO African Region, with 77 432 mortalities by 30 March 2021. At least 105 225 (3.5%) cases of infection were health workers of various categories in 46 countries. In some countries, more than 5% of front-line health workers have been infected with COVID-19. As the COVID-19 pandemic was still ongoing at the time of publication of this report, its socioeconomic impact on countries and its impact on health and the health workforce was yet to be evaluated and well understood. Its plausible implications, however, could be manifold and well beyond the scope of our work and the data collected in 2018 for this report.

## Methods

The 2018 HRH regional survey is an assessment of the status of the health workforce in the African Region. A similar assessment survey was conducted, and its findings, as reported in the 2006 World Health Report, focused more on capturing information on health workforce profile and training capacity. The 2018 HRH regional survey was designed to provide information on health workforce profile, education, training, accreditation, recruitment, working conditions, governance, management, and the roles and capacities of health professional bodies. The survey was conducted in the 47 Member States of the WHO African Region. Due to various terminologies of occupations/cadres of the health workforce in different countries, the International Standard Classification of Occupations (ISCO-08) was used as a framework to provide a coherent classification for categorizing occupations. The Regional Office routed the survey through the WHO country offices, which then officially requested the ministries of health in their respective countries to authorize the completion of the questionnaire and clearance of the data collected, before submission to WHO.

## Findings

Overall, the findings provide information on the health workforce profiles and densities, and distribution of health workers and training institutions by sector.

*Regional health workforce profile.* Findings show that nine countries (Algeria, Angola, Ethiopia, Democratic Republic of the Congo, Ghana, Kenya, Nigeria, South Africa and Tanzania,) each had a total number of health workers of more than 100 000; and seven countries (Gambia, Cabo Verde, Comoros, Equatorial Guinea, Central African Republic, Seychelles and Sao Tome and Principe) each reported a total number of health workers below 5000. Within the different categories or cadres, the highest stock reported were nurses/midwives (1 315 801), followed by community health workers (372 236). Nurses and midwives represent 41.5% of all health care workers, including community health workers. Without including community health workers, nurses and midwives accounted for 49.1% of health workers in the African Region in 2018. Also, there were 334 167 medical doctors, 370 104 laboratory technicians, 94 098 pharmacists and 45 047 dentists.

*Health workforce densities.* Nine countries (Algeria, Botswana, Cape-Verde, Gabon, Lesotho, Mauritius, Namibia, Seychelles and South Africa) of 47 in the Region had a density of doctors, nurses and midwives per 1000 population that attained or exceeded the MDG minimum density threshold of 2.28 doctors, nurses and midwives per 1000 population. Also, the current survey shows that as of 2018, only four countries (Seychelles, Namibia, Mauritius, and South Africa) had reached or exceeded the SDG density threshold of 4.45 per 1000 population.

Considering all health workers (13 categories, excluding health managers and support staff), the survey showed that the average regional HWF density was 2.9 per 1000 population in 2018. However, to enable the progressive realization of at least 70% of the UHC targets, the density requirement for the Region is estimated at 13.4 health workers per 1000 population. If community health workers are excluded, the density threshold is 10.9 health workers (comprising 12 categories) per 1000 population. Only Seychelles has reached this threshold, with 14.5 health workers per 1000 population, followed by Namibia (7.6), Mauritius (7.3), South Africa (6.5) and Lesotho (5.1). Eleven countries (Sierra Leone, Senegal, United Republic of Tanzania, Equatorial Guinea, Guinea, Togo, Cameroon, Mozambique, Mali, Malawi and South Sudan) reported a density between 0.5 and one health worker per 1000 population. On the other hand, five countries (Madagascar, Benin, Central African Republic, Chad and Niger) are reporting critical shortages, with HWF density of less than 0.5 health workers per 1000 population. As a result, massive increases in the health workforce are needed to attain a minimum coverage (70%) of UHC services in the African Region.

*Health workforce by sector.* The 2018 HRH regional survey showed that for the public and private not-for-profit sectors, the health worker category of professional nurses and associates constituted the majority, with an estimate of 28.2% and 52.1% respectively. In the public sector, community health workers (15.3%), administrative and support staff (12.9%) and laboratory workers (11.9%) follow professional nurses and associates. In the private for-profit sector, traditional and complementary medicine practitioners constituted the highest percentage (26.9%), followed by professional nurses and associates (21.6%) and community health workers (15.5).

*Health education training, and accreditation.* There are 3894 health training institutions in the Region, with 2128 (55%) owned by the public sector, 1351 (35%) by the private for-profit sector and 415 (11%) by the private not-for-profit sector. The public sector reported having the highest number of medical training institutions for medical practitioners, dentists and pharmacists in 209 institutions, accounting for 59%. The private for-profit and private

not-for-profit sectors respectively had 111 (31%) and 35 (10%) training institutions for medical practitioners, dentists and pharmacists. The public sector had the highest number of both nursing and midwifery training institutions with a total of 1375 institutions (54%) and health sciences schools for other mid-level cadres, making a total of 544 (55%). Thirty-three (70%) of the 39 countries had an accreditation body for training institutions, while seven countries (15%) had none and one country (Chad) was in the process of establishing one. The seven countries with no accreditation mechanisms were: Algeria, Benin, Burkina Faso, Congo, Mali, Mauritania and Togo.

*Employment and working conditions.* Findings show that there was an increase in the number of health workers recruited in the public sector in the WHO African Region from 2015 to 2016 (48 482 to 89 763 health workers). The number of recruited health workers, however, dropped in 2017 (76 693 health workers). The highest decrease in the number of recruited health workers was observed for nurses and midwives. Fifteen of 39 countries (39%) in the WHO African Region had health worker strikes once or twice in the last 12 months before the survey, whereas eight countries (21%) had them three or more times during the same period. The health worker strikes had a significant impact on the functioning of most health facilities, with three countries (13%) reporting that the strikes had limited impact. Only one country reported that the strikes had no impact at all on the functioning of its health facilities.

*Governance and management of the health workforce.* Thirty-nine countries in the WHO African Region reported that they had an HRH department or directorate in the ministry of health (MoH) responsible for developing, implementing and monitoring HRH strategies. In at least 35 of these countries, the main functions of the HRH department, unit or team included HRH planning, personnel administration, HRH information system, HRH policy development, and training and development. The HRH department comprised management staff, which made up 54% (103 165) of total staff, followed by support staff with about 39% (74 890) and technical staff at 7% (13,376).

Twenty-seven of the 43 countries (63%) that provided data reported that they had a national health policy for HRH, while 11 countries (12.8%) reported otherwise, and five reported that they were in the process of developing a national HRH policy. On the other hand, 30 countries (70%) reported that they had an HRH strategic plan, nine (21%) were in the process of developing one, and four countries did not have a plan at all. Twenty-five of the 30 countries (83%) reported that their strategic plan was costed and 27 countries (90%) reported that their HRH strategic plan was linked to the national development plan (table 12). Additionally, 24 countries linked their HRH strategic plan to the WHO regional road map for scaling up HRH or to the Global Strategy on HRH (80%); and 29 countries linked their HRH strategic plan to their health policy/strategic plan (97%).

Nine countries (23.1%) had implemented their national health workforce accounts (NHWA), whereas 14 countries (35.9%) had no NHWA, 12 countries (30.5%) were in the process of establishing theirs (30.8%), and four countries (10.3%) were planning to establish one. Results also showed that 28 countries (71.8%) had human resource information systems (HRIS) or a registry with a regularly updated database. Seven countries (10.3%) (Botswana, Central African Republic, Guinea-Bissau, Guinea, Malawi, Seychelles and South Sudan) had no functional HRIS or a registry with an updated database. Only five countries (12.8%) (Chad, Congo, Gambia, Nigeria, and Sao Tome and Principe) were in the process of developing their HRIS and two countries (5.1%) (Madagascar and Mauritius) had plans to set up their system or a registry with an updated database.

*Roles and capacities of health professional bodies.* Of the 132 professional bodies in the 39 countries that responded to the survey questionnaire regarding their roles and capacities, only 16.7% (22) reported that they had an outstanding regular performance appraisal for their board members. Fifty-three per cent of them had a

satisfactory criterion for the selection and appointment of senior officials and board members, while 5.3% of them had no selection criteria. About 56.5% (70) of them had mechanisms in place to detect fraudulent applications, while 4.8% (6) did not. The majority of the professional bodies rated satisfactory (43.1% (56)) or outstanding (30.8% (40)) on having only persons who met the stipulated criteria for licensure, and who could practise as health professionals. Also, 51.6% (63) of these bodies rated satisfactory on having efficient and effective registration renewal procedures. Nevertheless, most of them (44.4% (55)) rated satisfactory on ensuring that educational programmes were aligned with the competencies required by registrants for fitness to practise. The survey also showed that 27.4% (32) of these health professional bodies had efficient and effective processes relating to health professionals wishing to migrate, with 21.4% (25) rating the processes as outstanding. Thus, nearly half of the bodies gave at least a satisfactory rating, with 48.4% (59) of them rating as outstanding the use of a medical or nursing council Act in their work.

### Conclusion

The findings highlights poor health workforce policy and planning, shortage and inequitable distribution of health workers, inadequate HRH education and training capacity and health workforce regulation mechanisms and limited availability of health workforce information. The findings of the survey also provide evidence to guide countries in investing in health workforce education, training, accreditation, recruitment, information systems as well as governance, management, and regulation, towards the achievement of UHC and the SDGs.

# 1. BACKGROUND

## 1.1 Introduction

The health workforce is the cornerstone of every health system, and is critical to the provision of good quality health services, improving population health, ensuring universal health coverage and the achievement of the Sustainable Development Goals. The Global Strategy on human resources for health (HRH): Workforce 2030 (GSHRH) emphasizes that health systems can only function well when they have sufficient, well-trained, competent, responsive, motivated, productive and fairly distributed health staff. The World Health Report of 2000 acknowledged human resources as the most important component of all the health system inputs. However, despite an increase in efforts to address the shortage of HRH, there is still a critical shortage of health workers overall, compounded by the “lack of data and tools needed to optimise the existing workforce and advocate for more resources”. Countries worldwide are facing challenges in education and training, sustainable employment and deployment, retention and performance of their health workforce. These challenges have been part of the complex mix of Africa’s long-standing HRH crisis.

Globally, the World Health Organization undertook a comprehensive survey in 2005 which gathered the available data on the health workforce in all Member States including those in the African Region, towards the development of the 2006 World Health Report, the first of its kind to focus on the health workforce. This remarkable work resulted in a more comprehensive and up-to-date database on the health workforce in the African Region. To maintain this momentum, WHO AFRO established the Africa Health Workforce Observatory in 2007 to keep an updated regional database on the health workforce, monitor progress and support evidence-based decision-making, as well as inform policy dialogue and the investments needed to strengthen the health workforce.<sup>1</sup> Achieving this entails collecting data regularly from all the Member States in the African Region. The Regional Committee for Africa adopted the regional framework for the implementation of the GSHRH in 2017. The successful implementation of this strategy requires accurate HRH data from each of the Member States for providing a baseline for the regional targets and monitoring progress toward UHC and the SDGs of the respective countries. The National Health Workforce Accounts were adopted at the Sixty-ninth World Health Assembly for implementation globally, through resolution WHA69.19 to complement the AHWO.

Consequently, in 2018 WHO AFRO conducted a health workforce survey in the African Region covering all its Member States. Forty-seven countries were requested to complete a comprehensive questionnaire tailored to capture information on the health workforce profile, education, training, accreditation, recruitment, working conditions, governance, management, and the roles and capacities of health professional bodies. The aim of the 2018 HRH regional survey was first to update the data on the health workforce in all the Member States in the African Region to measure progress made in the implementation of the regional road map on HRH, and secondly to serve as a baseline for measuring future progress against the milestones and targets for the implementation of the regional framework for the implementation of the GSHRH.

## 1.2 Policy framework

### 1.2.1 Universal health coverage and the Sustainable Development Goals

The need to pursue equity in health and health care gained significant recognition in the Alma Ata Declaration in 1978,<sup>2</sup> the first international acknowledgement of the importance of primary health care as the key to achieving

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<sup>1</sup> World Health Organization. 2017. Understanding National Health Workforce Accounts. Health Workforce Department World Health Organization 20 Avenue Appia CH 1211 Geneva 27 Switzerland

<sup>2</sup> World Health Organisation. 1978. *Declaration of Alma Ata 1978: International Conference on Primary Health Care, Alma Ata, USSR*, 6-12 September 1978.

the goal of health for all in the 21st century. UHC aims at ensuring that everyone has access to the quality and affordable health care that they need.<sup>3</sup> In December 2012, the United Nations (UN) General Assembly urged governments to “scale up efforts to accelerate the transition towards universal access to affordable and quality healthcare services”<sup>4</sup>. In 2013, the commitment to UHC was renewed in the Recife Political Declaration during the Third Global Forum on HRH in Brazil, in which scaling up the health workforce was recognized as central to achieving UHC and other global health targets.

The UN 2030 Agenda for Sustainable Development adopted in 2015 by all 193 Member States includes SDG targets for all countries to eliminate poverty and substantially reduce inequalities across sectors by 2030.<sup>5</sup> SDG 3 that aims to “ensure healthy lives and promote well-being for all at all ages” is key to the attainment of the health-related goals, including ending HIV/AIDS, tuberculosis and malaria, reducing maternal and child mortality, expanding coverage of noncommunicable diseases, and achieving UHC. UHC is one of the 13 targets towards achieving SDG 3. The centrality of the health workforce is embodied in Goal 3 target 3. c, which seeks to “substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries...”.

The Framework for health systems development towards UHC in the context of the SDGs in the African Region adopted by the Regional Committee of health ministers in 2017, aims to guide Member States’ efforts towards realigning their health systems in a manner that facilitates movement towards UHC and attainment of the SDGs.<sup>6</sup> In 2017, the United Nations proclaimed 12 December as International Universal Health Coverage Day (UHC Day), to raise greater awareness among stakeholders on the need for strong and resilient health systems and UHC. The UN emphasizes that UHC cannot be achieved without accompanying health systems strengthening and concerted efforts to build a functional health workforce. Health systems strengthening is key to driving progress towards equity and UHC.<sup>7</sup> A health workforce adequately supported by the health system, one that is equitably distributed and accessible by the population is critical to the attainment of these aspirations.<sup>1</sup>

Forty years after the Declaration of Alma-Ata, on 5 October 2018, Governments adopted the Declaration of Astana,<sup>8</sup> reaffirming the commitments expressed in the 1978 Declaration of Alma-Ata and the 2030 Agenda for Sustainable Development, in pursuit of health for all. The Declaration of Astana, among other things, affirms that Member States will create decent work and appropriate compensation for health professionals and continue to invest in the education, training, recruitment, development, motivation, retention and availability of the PHC workforce, with an appropriate skill mix. In addition to that, Member States also pledged to strive for the retention and availability of the PHC workforce in rural, remote and less developed areas and to address the issue of international migration of health workers.

<sup>3</sup> World Health Organization. *Health in 2015: from MDGs to SDGs*. Geneva, [www.who.int/ghp/publications/mdgsdgs/en](http://www.who.int/ghp/publications/mdgsdgs/en) (2016).

<sup>4</sup> United Nations. 2012. A/RES/67/81 Global health and foreign policy. Resolution adopted by the General Assembly on 12 December 2012 [without reference to a Main Committee (A/67/L.36 and Add.1)]. United Nations General Assembly, Sixty-seventh session, agenda item 123. 2012.

<sup>5</sup> United Nations. 2015. Transforming Our World: The 2030 Agenda for Sustainable Development A/RES/70/1

<sup>6</sup> World Health Organization. 2017. Leave no one behind: strengthening health systems for UHC and the SDGs in Africa. WHO Regional Office for Africa, Brazzaville, Congo.

<sup>7</sup> WHO Regional Office Africa. *The Africa Health Transformation Programme 2015-2020 : a vision for Universal Health Coverage*. Brazzaville, 2015.

<sup>8</sup> World Health Organization and the United Nations Children’s Fund (UNICEF). 2018. *Declaration of Astana. Global Conference on Primary Health Care: From Alma-Ata towards universal health coverage and the Sustainable Development Goals*. Astana, Kazakhstan, 25 and 26 October 2018

### 1.2.2 Global Strategy on HRH and the African regional framework for its implementation

The GSHRH aims to accelerate progress towards achieving UHC and the SDGs by ensuring equitable access to health workers within strengthened health systems. The health workforce agenda has four objectives: (1) optimize performance, quality and impact of the health workforce; (2) align investments in HRH with current and future needs of the population and the health system; (3) build the capacity of institutions for effective policy stewardship, leadership and governance; and (4) strengthen data and monitoring on HRH. To facilitate the attainment of these objectives, the GSHRH provides state-of-the-art evidence and normative guidance for countries to strengthen their health workforce.

In 2017, building on the Road map for scaling up HRH for improved health service delivery in the African Region 2012–2025 that was adopted by the Sixty-second session of the Regional Committee, the African regional framework for the implementation of the GSHRH was developed. Ministers of health adopted the framework as a regional blueprint providing contextual guidance, milestones and targets as part of efforts by the Member States to operationalize the GSHRH by making adequate investments to enable the implementation of effective policies that ensure universal availability and accessibility and quality of the health workforce. The framework has four objectives: (1) optimize the performance, quality and impact of the health workforce through evidence-informed policies and strategies; (2) align investment in HRH with the current and future needs of the population and health systems; (3) strengthen the capacity of institutions for effective public policy stewardship, leadership and governance on HRH; and (4) strengthen data on the health workforce for monitoring and accountability.

### 1.3 State of health systems and service provision in the African Region

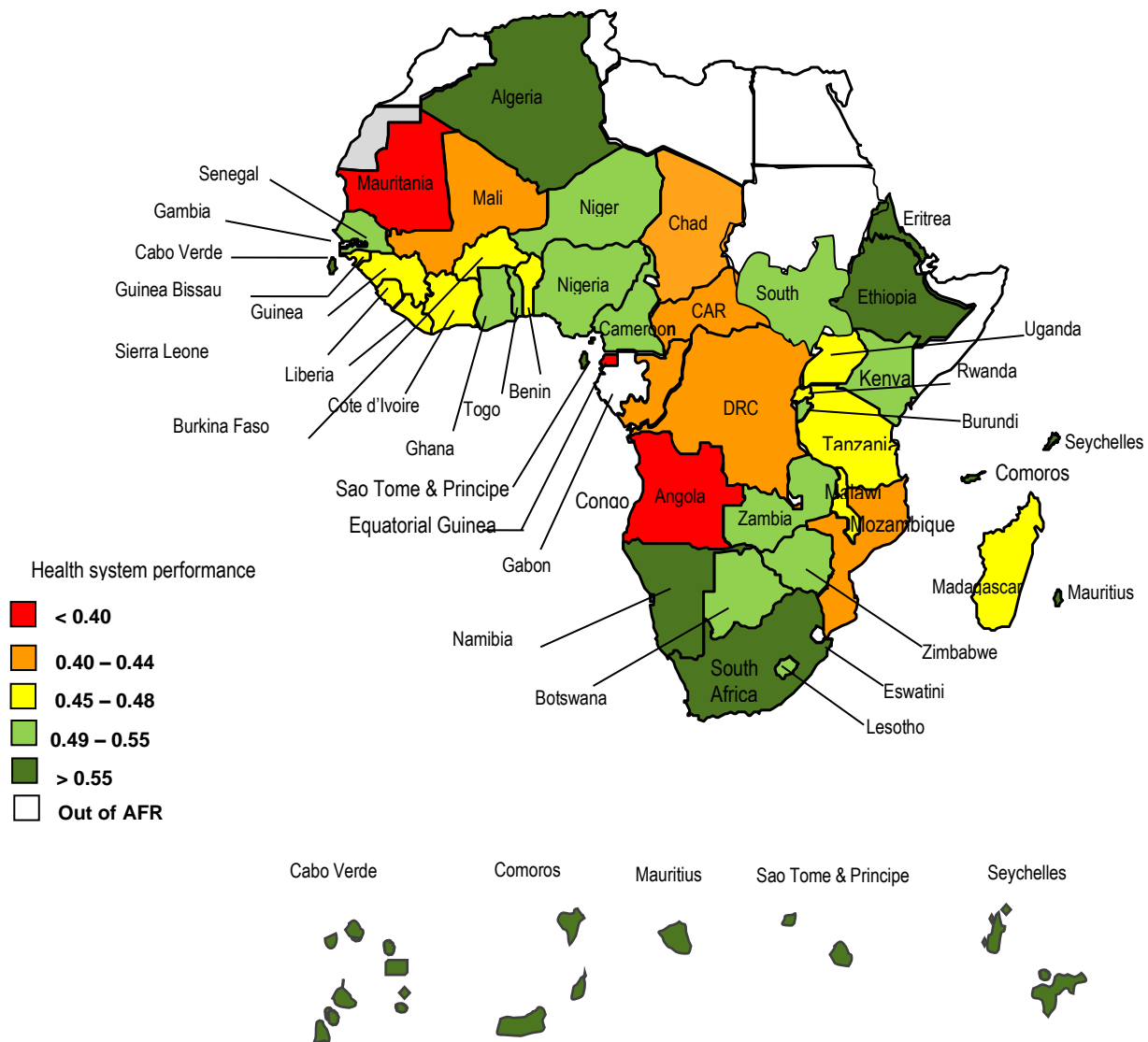
A well-performing health system is one that can ensure the delivery of essential health and health-related services to the population, where and when they are needed. The 2018 WHO AFRO report on the *State of health in the WHO African Region* shows a health system performance score of 0.49 for the African Region, which means that health systems are only functioning at a possible 49% of their achievable level of performance.<sup>9</sup> There is, however, a wide variation in system performance across the Region, with the consolidated score ranging from 0.26 to 0.7 ( Figure 1). This implies that the best performing system in the African Region is only performing at 70% of what is feasible. The report also shows that most of the countries' (41 out of 47) performance ranges from 0.4 to 0.6, a rather narrow performance range.

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<sup>9</sup> World Health Organization Africa. 2018. The state of health in the WHO African Region: An analysis of the status of health, health services and health systems in the context of the Sustainable Development Goals. WHO Regional Office for Africa. Congo Brazzaville



Figure 1: Variations in health system performance among countries in the African Region



Source: World Health Organization Africa. 2018

The 2018 WHO AFRO report further shows that on average, the population of the Region is only utilizing 48% of the possible health and health-related services needed for their health and well-being. Only five countries in the Region can provide 60% of the possible health and related services that their populations need. Algeria is the only country in the Region that can provide 70% of the possible health and related services that its population needs. In addition to that, the health systems in the African Region are only able to assure 32% of potentially possible access to essential services, raising concerns that this will continue to be a major hindrance to Member States' efforts towards attaining UHC and other health-related targets needed for the health and well-being of their populations. There are significant variations in the access indices among countries, ranging from a low of 0.12 (Central African Republic) to a high of 0.7 (Mauritius). Only three countries – Mauritius, Seychelles and Sao Tome and Principe –, have an access index above 0.5, highlighting the very low levels of access in the Region.

The WHO report further explains that a significant amount of effort has gone into improving the availability of health services, with less focus on promoting the quality of health care services. Findings show a quality of care index of 0.63 for the Region, meaning that quality of care in the Region is only 63% of what is feasible. The index varied markedly between countries in the Region, from a low of 0.25 to a high of 0.94. Only five among the 47 countries in the Region have a quality index above 0.75: Seychelles, Algeria, Madagascar, Malawi and Zambia in order of performance.

#### 1.4 Overview of the health workforce in the African Region

The health workforce was recognized as a top priority of the global agenda, following the publication of the Joint Learning Initiative report in 2004 and the World Health Report in 2006, detailing the extent of the shortage of health workers in various countries.<sup>3,10</sup> Although global efforts have been made to improve HRH, nearly all countries are challenged by critical shortages of health workers, skill-mix imbalance, poor working conditions, weak knowledge base, and maldistribution of health care workers.<sup>5</sup> In addition to that, limited availability of health workforce data further compounded the problem and slowed progress towards achieving UHC.<sup>1</sup>

In 2014, the Global Health Workforce Alliance and WHO reported based on the status of the global health workforce status, based on data from 186 countries. The report noted that only a few countries had comprehensive and valid information base on available health workers (53% of these countries had fewer annual data points and 17 countries had no data points).<sup>11</sup> It estimated that in 2014 there was a shortage of 7.2 million health workers worldwide, and predicted that by 2030, the deficit would grow to 18 million.<sup>1</sup> Eighty-three countries were below the minimum threshold of 22.8 skilled health professionals per 10 000 population, in relation to the objective of delivering essential services of relevance in line with the MDGs – primarily MDG 4 and 5<sup>14</sup>–, a threshold below which adequate service provision of basic health care might be impaired. It was further indicated in 2006 that the shortage is most severe in low resource settings, including the African Region, and that 36 out of the 57 Member States facing a health workforce crisis globally were from the African Region.<sup>6</sup> By 2015, only 11 Member States<sup>12</sup> in the African Region had met or surpassed the minimum threshold of 22.8 doctors, nurses and midwives per 10000 population.<sup>5</sup> However, there has been a general increase in the total number of doctors, nurses and midwives in more than half (54%) of the Member States but, in terms of density of health workers, only 23% have reached the minimum threshold. The needs-based shortage of health workers in Africa by 2030 is estimated at 6.1 million.<sup>5</sup> This anticipated shortage is already constraining the delivery of essential health services to achieve health-related development goals including the ability to accelerate progress towards UHC.<sup>13</sup> Evidence shows that countries that have addressed their health workforce challenges have improved health outcomes, while health workforce availability is also improving for the majority of countries for which data are available.<sup>1</sup>

Since the establishment of the Africa Health Workforce Observatory in 2007, fourteen Member States in the Region have established health workforce observatories to produce and utilize HRH information to support evidence-based policies. In 2015, thirty-three African Region Member States had costed and validated health workforce strategic plans.<sup>6</sup> Various approaches have been implemented to reduce the effects of the HRH crisis. For example, Cameroon, Ethiopia, Guinea, Liberia, Malawi, Mali, Rwanda and Sierra Leone have adopted community-based approaches using community health workers, especially in rural areas, for health promotion

<sup>10</sup> Joint Learning Initiative. Human Resources For Health – Overcoming the Crisis, <http://www.globalhealthtrst.org/report.html> (2004)

<sup>11</sup> Global health alliance and world health organization. 2014. A universal truth: no health without a workforce third global forum on human resources for health report. <http://www.who.int/workforcealliance/knowledge/resources/hrhreport2013/en/>

<sup>12</sup> Algeria, Botswana, Equatorial Guinea, Eswatini, Gabon, Ghana, Mauritius, Namibia, Sao Tome and Principe, Seychelles and South Africa

<sup>13</sup> Miseda et al. 2007, The implication of the shortage of health workforce specialist on universal health coverage in Kenya. Human Resources for Health 15:80 DOI 10.1186/s12960-017-0253-9

and preventive care. In addition, task shifting and task sharing have been adopted and implemented in more than 15 Member States to increase the delivery of quality essential services such as emergency obstetric and HIV care.<sup>6</sup>

### 1.5 Health workforce issues and challenges in the African Region

The African Region is facing the most severe shortage of health workers worldwide. There is a health workforce shortage in nearly all the WHO African Member States.<sup>6</sup> This has affected the delivery and quality of basic health services and affects progress in achieving UHC and the SDGs. While several Member States have made additional efforts to address this shortage, mainly by implementing international policies and regional programmes, the complexity and scope of the issue make it extremely difficult to resolve,<sup>14</sup> and the number of Member States facing HRH crises remains unchanged.<sup>6</sup> Several factors have contributed to the HRH crisis in WHO African Member States, including insufficient training and recruitment of health professionals, weak leadership and governance of the health workforce, poor retention of health workers, inadequate and inefficient use of financial and human resources, increasing demands on the sector from the growing world population, with a high burden of disease, limited availability of health workforce information, and wars, conflicts and insecurity.<sup>6</sup>

The African Region has the highest burden of disease of all the continents (per population)<sup>15</sup>, yet it has the lowest number and ratio of health workers per population.<sup>14</sup> While the Region has nearly 24% of the world's disease burden, it has only about 3% of all health workers globally.<sup>16</sup> The high burden of disease has further contributed to the human resource crisis in the Region. In 2015, the Region accounted for 26% of the estimated 10.4 million new cases of tuberculosis and 88% of the 214 million malaria cases.<sup>6</sup> The burden of disease currently in the African Region is mostly due to communicable conditions, noncommunicable diseases and violence/injuries. However, lower respiratory conditions, HIV/AIDS and diarrhoeal diseases are still the top causes of both morbidity and mortality. The rising number of disease outbreaks (such as Ebola and COVID-19) in Africa has also significantly impacted the few existing health workers. However, the crude death rate due to the top 10 causes of mortality reduced from 87.7 per 100 000 population in 2000 to 51.3 per 100 000 population in 2017, driven by reductions in malaria, HIV/AIDS and diarrhoeal diseases. Although life expectancy has been increasing in the Region, from 50.9 years to 53.8 years from 2012 to 2015, which represents the highest increase in any WHO region, the levels of healthy life in the Region are still very low compared to other regions.<sup>17</sup>

The African regional framework for HRH highlights the low production of health workers in the Region, due to inadequate HRH education and training capacity; the low number of health training schools; and the persistent weak leadership and governance of HRH, as key drawbacks to building a strong and effective health workforce and achieving UHC in the African Region. In this regard, the framework recommends the need for sustained political will and policy champions to coordinate the various aspects of HRH and to strengthen the capacity of HRH departments in the ministries of health to improve the quality and implementation of HRH strategic plans.

The regional framework also highlights poor retention of health workers as a key challenge contributing to the shortage of health workers in the Region and suggests that to retain the available health workers, there is a need to improve their working conditions, remuneration, protection and incentives. In addition to that, the framework

<sup>14</sup> Haseed, H. (2018). The Critical Shortage of Healthcare Workers in Sub-Saharan Africa: A Comprehensive Review. <https://ysjournal.com/the-critical-shortage-of-healthcare-workers-in-sub-saharan-africa-a-comprehensive-review/> accessed 26 November 2019

<sup>15</sup> Vos T, et al. Global, regional, national incidence, prevalence, and years lived with disability for 310 diseases and injuries 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*, 388 (10053):1545–602, 201

<sup>16</sup> Anyangwe, Stella C. E., and Chipayeni Mtonga. 2007. "Inequities in the Global Health Workforce: The Greatest Impediment to Health in Sub-Saharan Africa." *International Journal of Environmental Research and Public Health* 4 (2): 93–100.

also recommends the need to ensure the right skill mix and equitable distribution of health workers between urban and rural areas.

Furthermore, the framework points out that the inadequacy and inefficient use of financial and human resources in the Region have significantly contributed to the shortage of health workers. Only 1% of global financial resources for health are available in the African Region<sup>3</sup> and very few African countries can adhere to the Abuja Declaration signed in 2001 that recommends that governments allocate 15% of their annual budgets to health care. For instance, in 2014, only Liberia, Rwanda, Eswatini and Zambia met the Abuja Declaration target of allocating 15% of their annual budget to health. Although most Member States have costed national HRH plans, their implementation has been a challenge, mostly due to inadequate and inefficient use of financial resources. For example, some Member States cannot afford to absorb all the health workers produced, leading to the paradox of health worker unemployment amid shortages in the health system.<sup>6</sup> Human resources have been reported as contributing to about 57% of total health expenditure.<sup>17</sup>

The framework also highlights the limited availability of health workforce information as a contributing factor to the shortage of the health workforce. Indeed, in 2015, thirty-four Member States had not yet established a workforce observatory, while the capacity to collect, analyse and use HRH information is weak in the African Region. In addition, HRH research and dissemination of best practices have been limited. The framework emphasizes that the availability of accurate health worker data is crucial to informing evidence-based policies and that there is a need to strengthen data on the health workforce for monitoring and accountability.

## 1.6 Impact of the COVID-19 pandemic on health workers

Soon after the survey data collection was completed, and before the analysis, the COVID-19 pandemic was declared. The African Region has largely been thought to be less affected by the COVID-19 pandemic than other areas of the world in terms of the number of confirmed cases, the severity of the cases and reported mortalities. Nevertheless, more than 3 million people had been infected with COVID-19 in the WHO African Region, with 77 432 mortalities by 30 March 2021. At least 105 225 (3.5%) of these cases of infection were health workers of various categories in 46 countries.

In September 2020, WHO released the Health Worker Safety Charter, guiding countries on ensuring that health workers have the safe working conditions, training, pay and respect they deserve as they respond to the pandemic. The Charter calls on governments and other actors providing health services at the local level to take the following five actions to protect health workers better: protect health workers from violence; improve their mental health; protect them from physical and biological hazards; advance national programmes for health worker safety; and connect health worker safety policies to existing patient safety policies.

As the COVID-19 pandemic was still ongoing at the time of publication of this report, its socioeconomic impact on countries and its impact on health and the health workforce was yet to be evaluated and well understood. However, the plausible implications could be manifold, all of which were beyond the scope and the data collected for this report:

1. **Health worker mortalities and mental health issues:** Some health workers have died as a result of the COVID-19 pandemic in the African Region, and ultimately contributed to a (slight) reduction in the stock of health workers in the Region. Also, the 105 225 health workers that got infected and several others that might

<sup>17</sup> Lauer J, Soucat A, Araújo E, et al. Paying for needed health workers for the SDGs: An analysis of fiscal and financial space. In: Buchan J, Dhillon IS, Campbell J, eds. In Health Employment and Economic Growth: An Evidence Base. Geneva: World Health Organization; 2017:236.

- have been exposed required some time away from work to recover or isolate themselves. This would have contributed to absenteeism and loss of workman days and, coupled with rising infections in the population and the reduced staff strength, culminated in increased workload, leading to burnouts and mental exhaustion.
2. **Emergency recruitment of health workers:** As part of efforts to boost the health system's capacity to respond to the COVID-19 pandemic, many countries in the African Region undertook substantial recruitment of health workers into the public sector, from the pool of unemployed health workers and/or recalling of retired health workers. Taking these recruitments into account, the stock and distribution (public and private sectors) of health workers in the various countries and unemployed health workers could substantially be different from previous and expected trends, and as estimated in this report.
  3. **Health worker protection and motivation (incentives):** In addressing concerns about health worker safety and working conditions in the wake of the pandemic, most countries invested in protecting health workers by providing personal protective equipment (PPEs) and vaccinations, when effective vaccines became available. Additionally, some countries provided cash incentives and life insurance packages to motivate health workers to respond to the pandemic. While these measures might have mitigated labour unrest in some of these countries, their long-term sustainability has yet to be examined. The impact of such unplanned investments on the wage bill could result in subsequent budgetary restrictions that may adversely impact sustaining decent working conditions and employment of health workers from the education pipeline.
  4. **Clarion call for specialist health professions education:** The pandemic also brought to the fore the inadequacies in health workforce stock, especially for specialized health professionals, an issue some countries are beginning to take steps to address. This may lead to increased production of specialist professionals in the near future; hence appropriate planning for their employment, retention and equitable deployment is essential.
  5. **Potential impact on fiscal and economic space for health workforce:** The pandemic and the associated lockdown measures taken by governments continue to affect economic activities adversely. This, in the long run, may also impact the health workforce in different ways. The World Bank warned of heightened unemployment in the immediate aftermath of the pandemic. This may affect health workers due to low public-sector fiscal space owing to the unplanned expenditure, future austerity measures as economies recover, sluggish economic growth prospects, limited government revenues and reduced overseas development assistance. These may adversely impact countries' ability to expand investment in decent health workforce employment retention and protection.

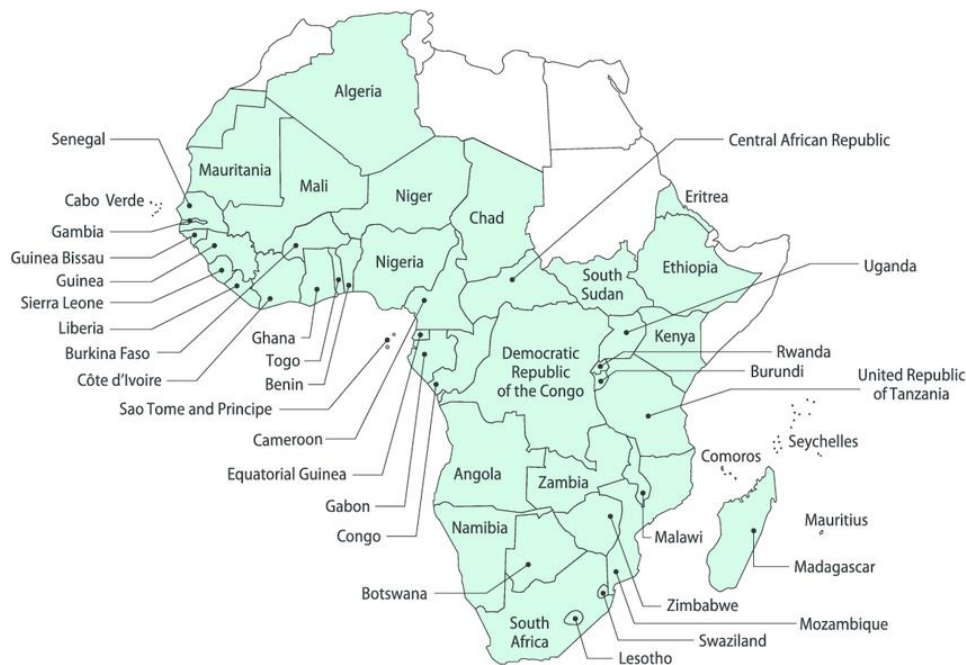
In light of the above plausible implications of COVID-19 on the health workforce, separate streams of work are at various stages of development to help shed light on the impact of COVID-19 on the workforce and explore the long-term mitigation measures that will ensure the availability of adequate health workers for resilient and adaptive health systems for Africa, towards universal health coverage.

## 2. METHODOLOGY

### 2.1 Overview

The 2018 HRH regional survey is an assessment of the status of the health workforce in the African Region. A similar assessment survey was conducted, and its findings were reported in WHR 2006.<sup>18</sup> This assessment focused more on capturing information on health workforce profile and training capacity. The 2018 HRH regional survey was designed to provide information on health workforce profile, education, training, accreditation, recruitment, working conditions, governance, management, and the roles and capacities of health professional bodies. The survey was conducted in the 47 Member States of the WHO African Region as illustrated in Figure 2. The WHO African Region does not include all the countries on the African continent and is not limited to sub-Saharan Africa. The “Region” is used when referring to the African Region as defined by WHO, while “Africa” is used when discussing the continent, including its islands.

Figure 2: Map of the WHO African Region



Source: World Health Organization, Africa. 2018<sup>13</sup>

In this survey, the health workforce refers to “all people engaged in actions whose primary intent is to enhance health”<sup>3</sup>. This survey considered two types of health workers. The first group comprises workers who directly deliver health services and are called “health service providers” and the second group consists of workers not engaged in the direct provision of services. The latter are non-health-trained workers in health industries, who occupy positions such as managers, computing professionals, clerical workers and drivers, and who provide managerial and infrastructure support, as well as welfare professionals for whom there is some overlap with health workers such as social workers.

<sup>18</sup> World Health Organization. 2006. Status of Human Resources for Health in the African Region: Survey Report

## 2.2 Framework

Due to various terminologies of health workforce occupations/cadres in different countries, some level of harmonization was required to enable comparability across countries. Therefore, this survey used the International Standard Classification of Occupations (ISCO-08) as a framework, which provides a coherent classification for categorizing occupations.<sup>19</sup>

*Table 1: ISCO-08 classification of health occupations*

Occupation	Code ISCO 08
Generalist medical practitioners	2211
Specialist medical practitioners	2212
Nursing professionals	2221
Nursing associate professionals	3221
Midwifery professionals	2222
Midwifery associate professionals	3222
Paramedical practitioners	2240
Dentists	2261
Dental assistants and therapists	3251
Pharmacists	2262
Pharmaceutical technicians and assistants	3213
Environmental and occupational health and hygiene workers	2263, 3257
Physiotherapists and physiotherapy assistants	2264, 3255
Optometrists and opticians	2267, 3254
Medical imaging and therapeutic equipment operators	3211
Medical and pathology laboratory technicians	3212
Medical and dental prosthetic technicians	3214
Community health workers	3253
Medical assistants	3256
Traditional and complementary medicine practitioners	2230, 3230
Health care assistants and other personal care workers in health services	5321, 5322, 5329
Health service managers	1342
Medical records and health information technicians	3252

The ISCO classification helps to organize jobs into a clearly defined set of groups according to the tasks and duties are undertaken in the job. The current version, known as ISCO-08 was published in 2008 and is the fourth iteration, following ISCO-58, ISCO-68 and ISCO-88. The ISCO-08 classification of health occupations is shown in Table 1.

## 2.3 Data collection and analysis

The Regional Office routed the survey through the respective WHO country offices, which then officially requested the ministries of health in their respective countries to authorize completion of the questionnaire and clearance of the data collected before submission to WHO. The focal points of the HRH units or equivalent in the ministry of health (such as the national health workforce observatories, the HRH information systems at the central level or directorate of human resource management and development) provided the information from their databases and answered the qualitative questions.

<sup>19</sup> The International Standard Classification of Occupations (ISCO) is an International Labour Organization (ILO) classification structure for organizing information on labour and jobs. It is part of the international family of economic and social classifications of the United Nations.

Where necessary, the WHO country offices recruited national consultants to directly support the HRH directors, or their equivalent, to complete the questionnaire and send it back to WHO AFRO for data processing. The consultant was required to work closely with the directorate of HRH of the ministry of health under the supervision of the WHO country office. The data collection period was one calendar month on average. Each national consultant produced a survey report at the end of the exercise, in addition to the questionnaire, duly completed and approved by the ministry of health. The three WHO Inter-country Support Teams (Central Africa, East and Southern Africa and West Africa) were involved in following up on progress in their respective subregions. WHO AFRO did the overall follow up, data quality check, data capturing and analysis.

Given the diversity of information sought and the multiplicity of actors involved, it was recommended that several sources of information should be used. It was further recommended that the data should be triangulated to validate them. A questionnaire in four sections was used to capture the data: availability of active health workers; HRH policy, strategy and plan; HRH management capacity; and supply and demand of health workforce (ref Annex 2). The data sources are presented below in Table 2.

Table 2: Data sources and carriers

Description	Data sources	Data carriers (data media)
Distribution of active health workers	<ul style="list-style-type: none"> <li>- Ministry of health, human resource unit (MoH/ HR Unit)</li> <li>- Public service</li> <li>- National professional councils, associations</li> <li>- Private sector</li> </ul>	Registries, country HRH profiles, reports
Active health workers of expatriates	<ul style="list-style-type: none"> <li>- MoH/ HR unit</li> <li>- National councils</li> <li>- Private sector</li> </ul>	Reports, country HRH profiles, registries, registry (registration tables)
Category and sector	<ul style="list-style-type: none"> <li>- MoH/HR unit</li> <li>- National councils</li> <li>- Private sector</li> </ul>	Reports, lists, directories, etc.
Human resource for health Policy, strategy and plan	<ul style="list-style-type: none"> <li>- MoH/ HR unit</li> </ul>	
Governance and regulatory capacity within the ministry of health	<ul style="list-style-type: none"> <li>- MoH/ HR unit</li> </ul>	Administrative acts creating governance and regulatory bodies
Existing regulatory bodies and their capacities	<ul style="list-style-type: none"> <li>- National councils</li> <li>- Private sector</li> </ul>	Reports, country HRH profiles,
Public sector recruitment	<ul style="list-style-type: none"> <li>- HR public service</li> <li>- Finances</li> </ul>	Reports
Number of health training institutions	<ul style="list-style-type: none"> <li>- Ministry of Higher Education</li> <li>- Ministry of education / Vocational training</li> </ul>	Reports, country HRH profiles, annual statistics
List of training institutions for doctors, dentists and pharmacists	<ul style="list-style-type: none"> <li>- Ministry of higher education</li> </ul>	Reports, country HRH profiles,
List of health science schools for the other categories	<ul style="list-style-type: none"> <li>- Ministry of higher education</li> <li>- Ministry of education/ Vocational training</li> <li>- Private sector</li> </ul>	Reports, country HRH profiles,

Forty-three (43) countries in the Region contributed to the data collection, yielding a response rate of 91.5%. Due to a very comprehensive data collection process, only in rare cases was the triangulation of data with secondary data sources needed to clarify uncertainties. Such necessary verifications and clarifications were done through HRH reports provided by the countries and in contact with the respective country offices, and using the information reported by countries in the NHWA. All the data were compiled centrally at the WHO Regional Office for Africa and entered into an Epi Info version 7.2 tool. Further data analysis was done using Microsoft Excel 2016.



## 2.4 Limitations

The limitations of the methodology have to do with the quality of the data collected and the application of the processes at the country level:

- There were delays in completing the questionnaire from some countries. For some countries, the filled questionnaires were submitted one year after the survey was launched.
- Most countries requested support in the mapping of their contextual staff categories based on the ISCO classification. This support was provided by the Regional Office to streamline the staffing categories presented in this survey.
- Generally, most of the reported data from countries were not disaggregated by subcategory, sector or geographical locations, and this affected the level of the analysis presented. The reason for this was the varying levels of the health workforce information systems and data sources.
- For most of the reported data, there were few data sources such as the national health workforce accounts, health workforce observatories, registries to aid triangulation, especially for information from the private sector. Again, this was reported to be due to weak health workforce information systems at the national and subnational levels.
- For various reasons, few countries provided data on all sections of the questionnaire. The response rate ranged from 80% to 95%, depending on countries' HRIS maturity and other factors.

### 3. REGIONAL HEALTH WORKFORCE PROFILE

#### 3.1 Health worker stock and densities

This WHO regional survey assessed health worker stock and densities in the Member States in 2018. In this regional survey, health worker stock refers to an estimate of the total absolute number of active health workers, while health worker densities were calculated based on the absolute number of health workers available in a country relative to the total population (per 1000 population). Population estimates for each country were taken from the United Nations' World Population Prospects 2019.<sup>20</sup> Information on health worker stock and densities helps to determine the health workforce size, composition and distribution, as well as to check if the health workforce is adequately prepared to provide UHC services.<sup>21</sup> It also helps to detect gaps in certain professions and mismatches in geographical or sectoral distribution. Understanding HRH composition and distribution enables countries to generate insights into their needs and to guide planning and implementation of policy interventions on HRH for strengthening their health workforce. In addition to that, the information on health worker densities helps to compare the health workforce landscape nationally and globally.

Table 3 presents estimates of the total number of active health workers per country in the 47 countries of the Region in 2018, disaggregated by selected categories or cadres. Results show that nine countries (Nigeria, South Africa, Algeria, Ethiopia, Democratic Republic of the Congo, Kenya, Ghana, Angola and the United Republic of Tanzania) each had a total number of health workers of more than 100 000 and seven countries (Gambia, Cabo Verde, Comoros, Equatorial Guinea, Central African Republic, Seychelles and Sao Tome and Principe) each reported a total number of health workers of below 5000. The highest total stock of health workers per country was reported for Nigeria (940 193) followed by South Africa (456 042), Algeria (329 494), Ethiopia (250 893) and Democratic Republic of the Congo (224 002). The lowest total stock of health workers per country was reported for Sao Tome and Principe with 921 health workers. Within the different cadres or categories, the highest stock reported were nurses and midwives (1 315 801), followed by community health workers (372 236). Nurses and midwives represent 41.5% of all health care workers including community health workers. Without including community health workers, they represent 49.1% of health workers. Also in 2018, the African Region had 334 167 medical doctors, 370 104 laboratory technicians, 94 098 pharmacists and 45 047 dentists.

<sup>20</sup> United Nations. World Population Prospects 2019. <https://population.un.org/wpp/>

<sup>21</sup> World Health Organization. National Health Workforce Account: A Handbook

Table 3: Number of health workers by country and selected cadres in the African Region

Country	Physician generalists	Physician specialists	Nurses/midwives	Dentists	Pharmacists	Laboratory technicians	Community Health Workers	Other Health Workers	Health managers & support staff	Total
Algeria	34 077	39 091	66 325	12 781	14 106	14 548	-	61 196	87 370	<b>329 494</b>
Angola	3 043	3 550	47 520	1 652	2 302	98	1 680	19 961	28 652	<b>108 458</b>
Benin	391	319	4 073	-	14	241	-	5 436	156	<b>10 630</b>
Botswana	815	38	6 935	94	487	460	-	1 978	-	<b>10 807</b>
Burkina Faso	888	738	16 894	80	792	699	2 749	1 941	1 524	<b>26 305</b>
Burundi	889	195	9 156	14	119	1 071	11 845	10 404	4 289	<b>37 982</b>
Cameroon	2 400	859	10 615	308	350	5 235	-	11 117	250	<b>31 134</b>
Cabo Verde	165	287	795	81	172	65	117	437	1 418	<b>3 537</b>
Central African Republic	263	72	1 195	10	36	112	115	528	87	<b>2 418</b>
Chad	646	157	4 799	3	269	749	7	1 857	1 168	<b>9 655</b>
Comoros	130	90	1 234	32	55	8	-	1 163	44	<b>2 756</b>
Congo	269	275	5 081	27	157	320	-	1 982	901	<b>9 012</b>
Côte d'Ivoire	4 246	1 356	17 190	506	2 495	nd	14 556	35 797	230	<b>76 376</b>
Democratic Republic of the Congo	30 768	778	107 427	404	1 687	2 934	-	3 043	76 961	<b>224 002</b>
Equatorial Guinea	246	-	406	-	10	2	-	1 986	-	<b>2 650</b>
Eritrea	160	120	3 984	186	451	549	243	579	3 563	<b>9 835</b>
Eswatini	211	67	2 218	74	281	370	6 324	3 519	1 410	<b>14 474</b>
Ethiopia	5 867	5 396	77 933	1 889	10 752	10 450	37 259	23 808	77 539	<b>250 893</b>
Gabon	570	798	6 085	40	227	439	-	1 038	2 257	<b>11 454</b>
Gambia	181	117	1 498	3	79	138	1 553	355	-	<b>3 924</b>
Ghana	3 316	1 090	53 452	713	2 127	1 563	15 820	19 442	24 660	<b>122 183</b>
Guinea	2 649	138	7 195	73	255	181	16 567	129	670	<b>27 857</b>
Guinea-Bissau	290	28	1 421	16	82	172	4 057	1 213	611	<b>7 890</b>
Kenya	5 602	2 440	59 901	1 764	2 295	-	58 079	31 716	2 759	<b>164 556</b>
Lesotho	815	183	3 746	159	398	205	14 508	8 098	2 240	<b>30 352</b>
Liberia	234	12	9 415	24	1 071	-	3 391	4 758	5 715	<b>24 620</b>
Madagascar	4 593	637	7 724	556	329	306	35 000	1 774	6 766	<b>57 685</b>
Malawi	2 582	178	6 025	112	387	542	10 016	3 555	178	<b>23 575</b>
Mali	2 151	715	8 394	30	1 424	-	1 152	4 779	8 331	<b>26 976</b>
Mauritania	808	818	4 872	151	100	122	500	531	1 552	<b>9 454</b>
Mauritius	1 188	1 207	4 986	466	748	291	180	2 218	3 610	<b>14 894</b>
Mozambique	1 555	625	13 781	545	2 310	1 951	2 205	6 544	29 201	<b>58 717</b>
Namibia	1 044	401	12 956	289	907	510	2 292	4 771	2 470	<b>25 640</b>
Niger	1 065	-	4 483	30	60	432	55	1 661	768	<b>8 554</b>
Nigeria	74 543	9 364	301 579	25 487	24 668	311 269	116 454	76 829	0	<b>940 193</b>
Rwanda	783	567	10 758	228	167	1 990	45 000	503	0	<b>59 996</b>

## THE STATE OF THE HEALTH WORKFORCE IN THE WHO AFRICAN REGION

Country	Physician generalists	Physician specialists	Nurses/midwives	Dentists	Pharmacists	Laboratory technicians	Community Health Workers	Other Health Workers	Health managers & support staff	Total
Sao Tome & Principe	40	20	256	-	-	-	-	417	79	<b>812</b>
Senegal	676	2 207	7 592	236	215	328	17 417	7 107	6 003	<b>41 781</b>
Seychelles	125	115	1 277	163	124	71	-	453	-	<b>2 328</b>
Sierra Leone	234	47	5 693	423	156	311	505	685	-	<b>8 054</b>
South Africa	29 311	14 192	287 458	6 816	16 195	-	54 180	47 890	-	<b>456 042</b>
South Sudan	338	73	3 726	32	360	272	1 455	1 694	20	<b>7 970</b>
United Republic of Tanzania	2 434	451	31 940	682	1 845	4 361	0	61 396	633	<b>103 742</b>
Togo	230	354	3 234	21	226	615	7 500	7 323	4 073	<b>23 576</b>
Uganda	17 007	179	23 644	26	324	3 874	-	4 646	-	<b>49 700</b>
Zambia	1 701	325	17 948	455	1 708	1 602	1 262	7 538	17 801	<b>50 340</b>
Zimbabwe	1 715	244	26 689	347	776	648	2 143	8 023	9 829	<b>50 414</b>
<b>TOTAL</b>	<b>243 254</b>	<b>90 913</b>	<b>1 311 508</b>	<b>58 028</b>	<b>94 098</b>	<b>370 104</b>	<b>486 186</b>	<b>503 818</b>	<b>415 788</b>	<b>3 573 697</b>

- No data reported or zero

The density of health workers (doctors, nurses and midwives) strongly and positively correlates with maternal, child and infant mortality, thus it is a critical indicator that health workers save lives.<sup>20</sup> Figure 3 shows that in 2018, 24 countries in the African Region had a health workforce density per 1000 population of less than 1.0 doctors, nurses and midwives per 1000 population, and the density in 13 countries ranged from less than 2.22 to 1.0 doctors, nurses and midwives per 1000 population.

Nine countries (Algeria, Botswana, Cape-Verde, Gabon, Lesotho, Mauritius, Namibia, Seychelles and South Africa) of 47 in the Region had a density of doctors, nurses and midwives per 1000 population that attained or exceeded the MDG minimum density threshold of 2.28 doctors, nurses and midwives per 1000 population (Figure 4). Also, the current survey shows that as of 2018, only four countries (Seychelles, Namibia, Mauritius, and South Africa) had reached or exceeded the SDG density threshold of 4.45 per 1000 population.

Figure 3: Density of doctors, nurses and midwives per 1000 population in the African Region in 2018

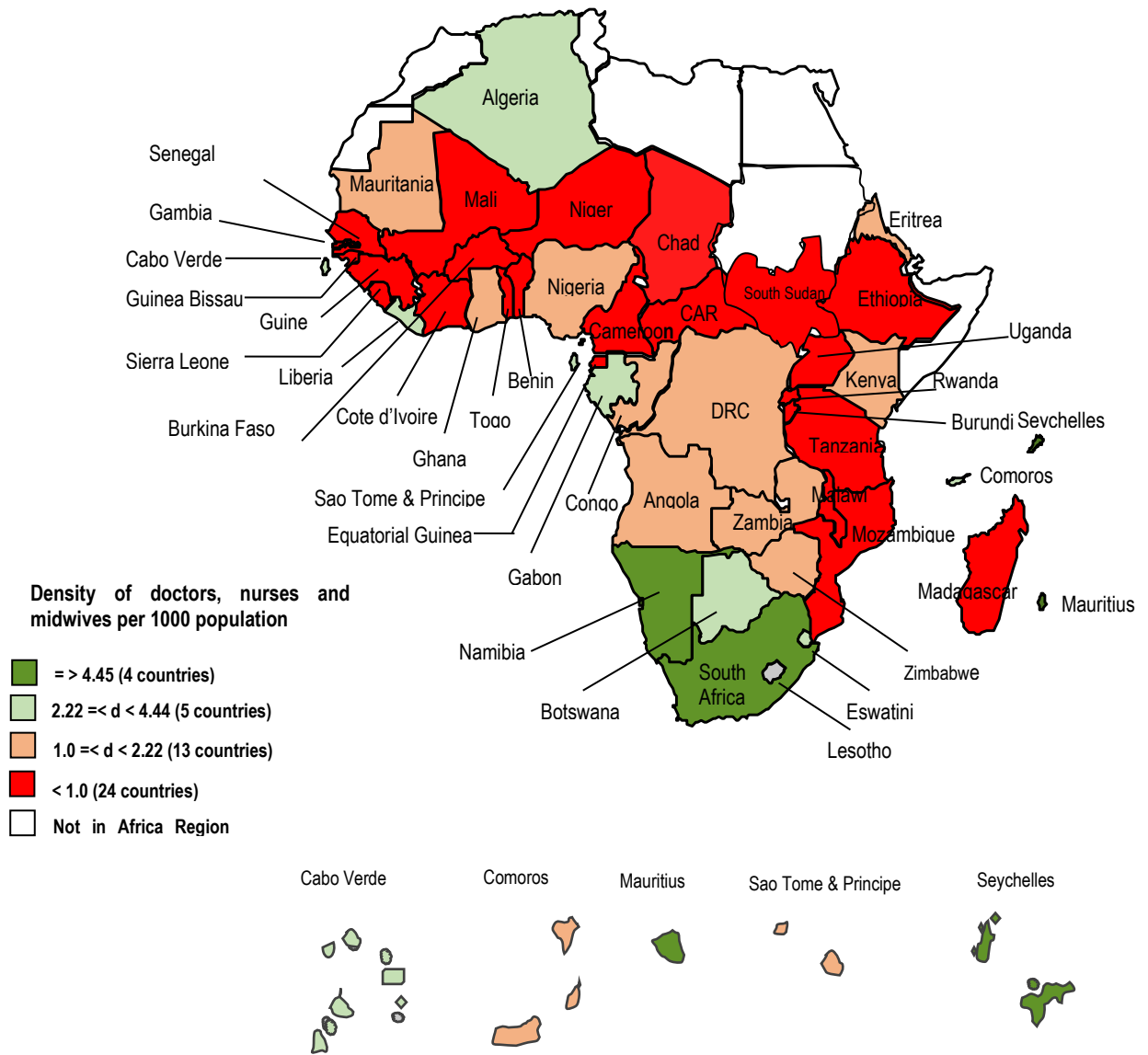
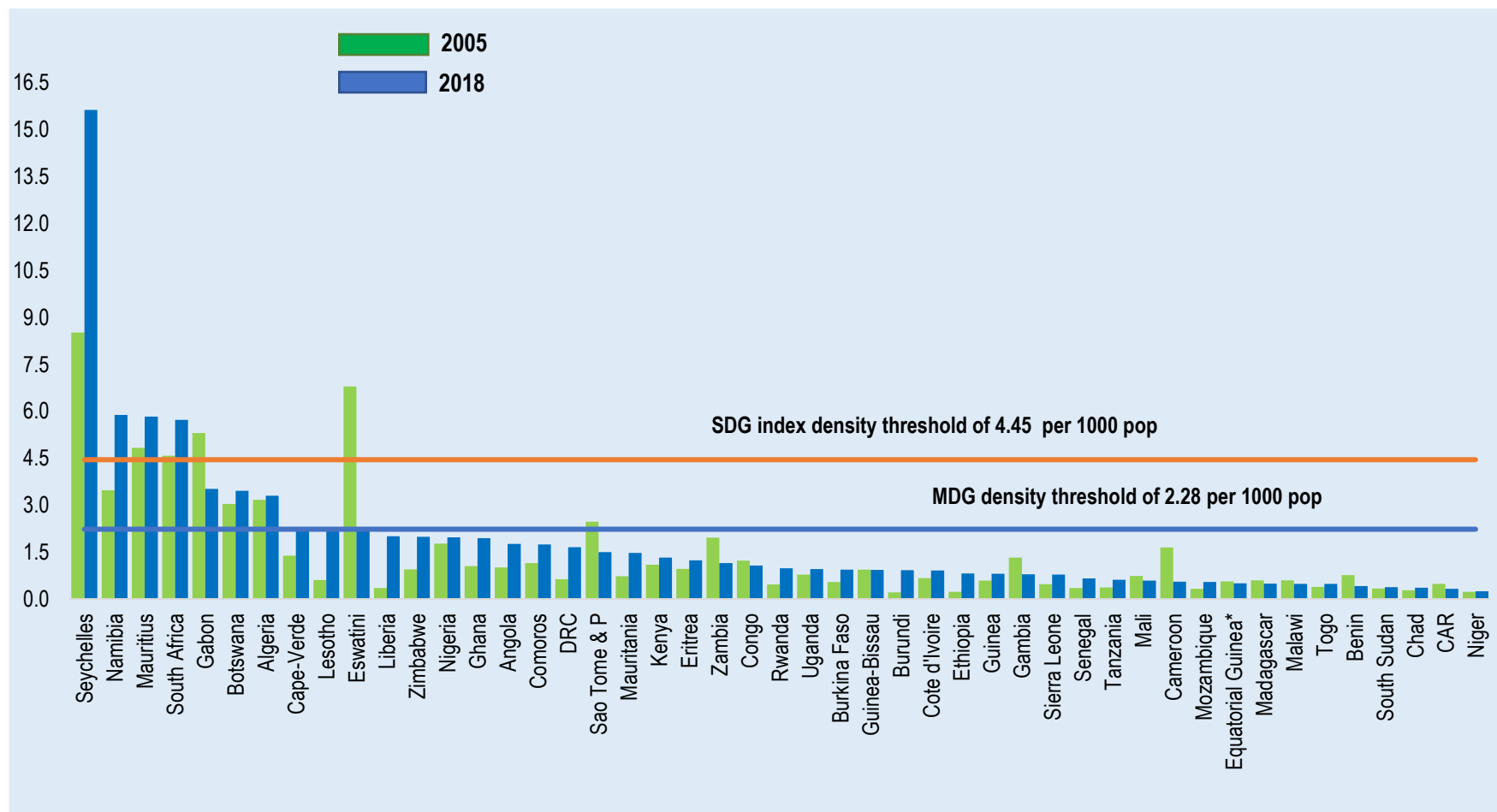


Figure 4: Density of doctors, nurses and midwives per 1000 population in 2005 and 2018 in the African Region



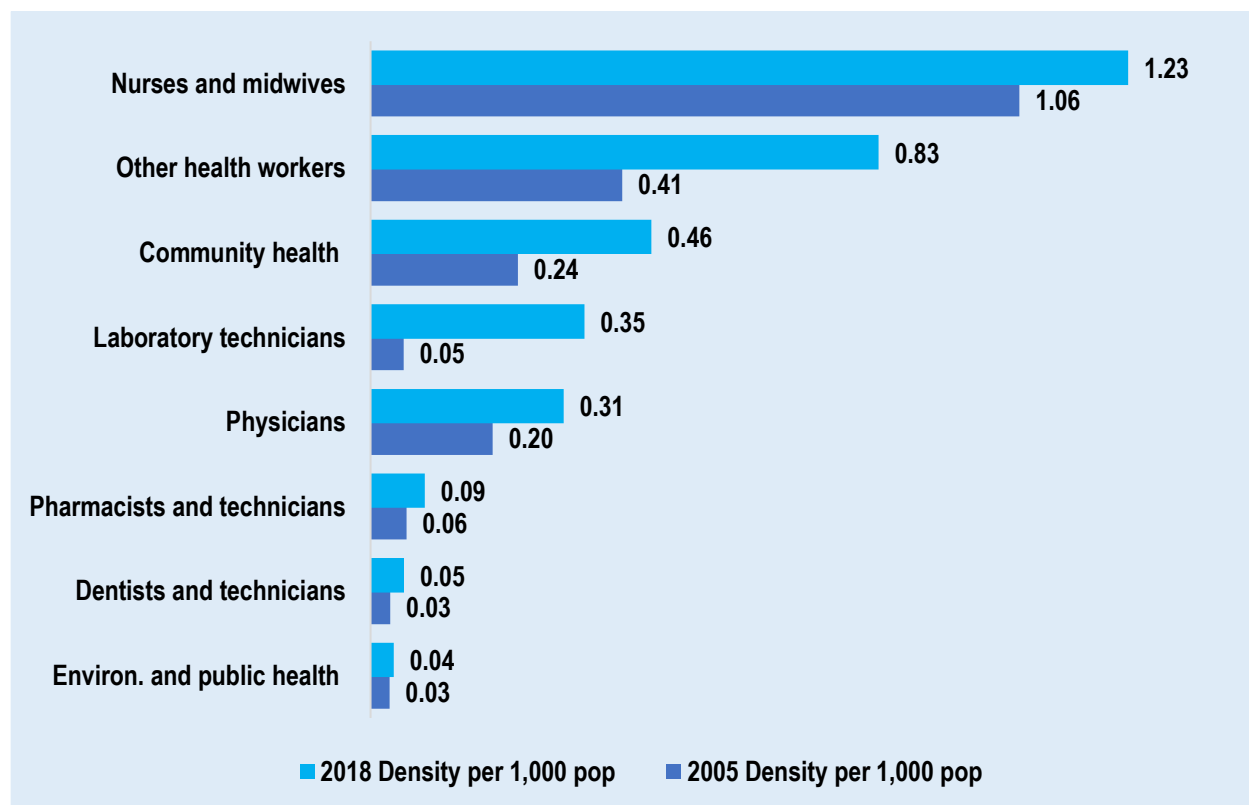
The total reported number of health workers in all cadres in 2018 was 3 573 697 and thus 2.2 times greater than the total number of health workers in all cadres of 1 561 120 reported in 2005. The results in table 4 show that the density of health workers per 1000 population in the African Region increased from 2.08 in 2005 to 3.36 in 2018. An increase in the stock of all cadres was also recorded. In 2015, the nurses and midwives cadre accounted for 51% of the health workforce, with management, support staff and community health workers cadre at 12%, closely followed by the physicians cadre at 10%. In 2018, the nurses and midwives cadre accounted for 37% of the health workforce, while community health workers accounted for 14% and management and support staff, 13%.

*Table 4: Density per 1000 population of different occupations of the health workforce between 2005 and 2018 in the 47 countries in the African Region*

Category	2005		2018	
	Number	Density per 1000 pop	Number	Density per 1000 pop
Physicians	149 186	0.20	334 167	0.31
Nurses and midwives	792 873	1.06	1 311 508	1.23
Dentists and technicians	23 964	0.03	58 028	0.05
Pharmacists and technicians	43 791	0.06	94 098	0.09
Environ. and public health	23 284	0.03	40 043	0.04
Laboratory technicians	40 581	0.05	370 104	0.35
Community health	179 968	0.24	486 186	0.46
Administrative and support staff	187 968	0.25	458 989	0.43
Other technicians and health cadres	119 505	0.16	420 574	0.40
<b>Total</b>	<b>1 561 120</b>	<b>2.08</b>	<b>3 573 697</b>	<b>3.36</b>

Furthermore, the results showed that the density per 1 000 population for selected categories of health workers increased specifically for community health workers, physicians, other health workers, laboratory technicians, pharmacists and technicians, and dentists and technicians from 2005 to 2018, as shown in table 4 and figure 5.

Figure 5: Density of health workers per 1000 population per cadre in 2005 and 2018



The average nurse/midwife to physician ratio in the 47 countries in the African Region in 2018 was 3.5. Liberia had the highest nurse/midwife to physician ratio at 38.3, while Algeria had the lowest at 0.9.

Twenty-seven countries were above the average and 12 were below the average. Liberia had the highest nurse/midwife to physician ratio of 38.3, while Algeria had the lowest at 0.9.

The regional average of health managers in the 2018 survey is 0.86% with 17 countries having higher percentages. Sao Tome and Principe, Congo and Chad have the highest proportion of health managers at 9.73%, 8.77% and 7.58% respectively. Data on health managers were not available for 13 countries: Benin, Botswana, Equatorial Guinea, Eritrea, Gambia, Kenya, Nigeria, Rwanda, Seychelles, Sierra Leone, South Africa, Uganda and Zambia.



Figure 6: Nurse/midwife to physician ratio in the African Region in 2018 in 47 countries

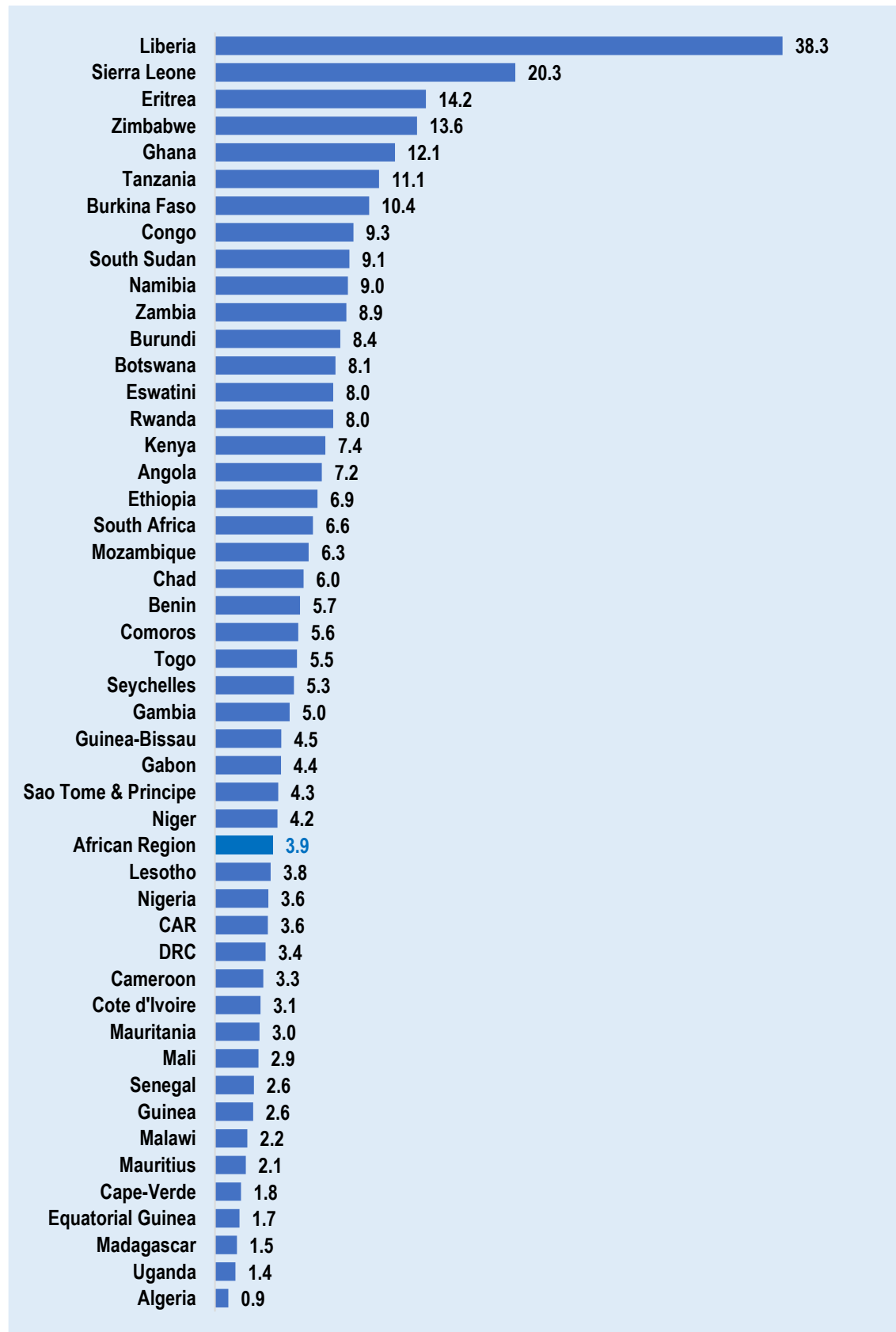
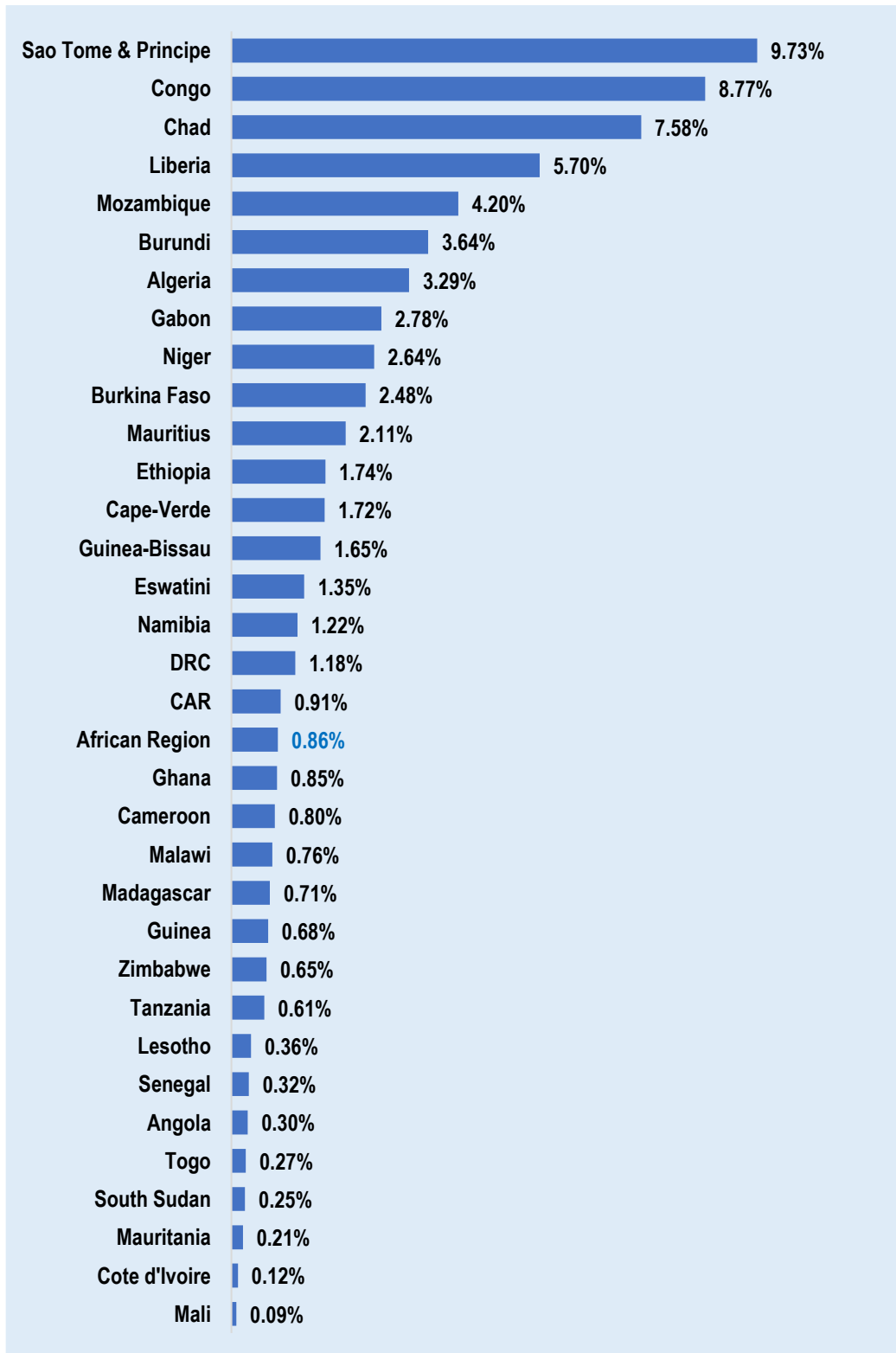


Figure 7: Percentage of health managers in 2018 in 33 countries compared to the total number of health workers in the WHO African Region



### 3.2 Distribution of health workers by occupation and sector

The 2018 HRH regional survey showed that for the public and private not-for-profit sectors, the health worker category of professional nurses and associates constituted the majority with an estimate of 28.2% and 52.1% respectively. In the public sector, community health workers (15.3%), administrative and support staff (12.9%) and laboratory workers (11.9%) come after professional nurses and associates. In the private for-profit sector, traditional and complementary medicine practitioners constituted the highest percentage (26.9%), followed by professional nurses and associates (21.6%) and community health workers (15.5).

Table 5: Distribution of health workers by occupation in 47 countries in the African Region in 2018

Categories	% Public sector	% Private for-profit	% Private not-for-profit	% Total	Total Number
Physician generalists	6.4	6.2	10.1	6.8	243 254
Physician specialists	2.2	0.6	5.7	2.5	90 913
Professional nurses and associates	28.2	21.6	52.1	30.6	1 093 957
Professional midwives and associates	6.8	3.3	1.4	6.1	217 551
Dentists and technicians	1.5	0.3	3.2	1.6	58 028
Pharmacists and technicians	2.2	1.2	6.7	2.6	94 098
Laboratory workers	11.9	2.9	1.2	10.4	370 104
Technicians on medical imaging and equipment	0.6	0.5	1.7	0.7	25 804
Environment and public health workers	1.2	0.1	0.8	1.1	40 043
Health services managers	0.9	0.5	0.4	0.9	30 754
Administrative and support staff	12.9	6.3	7.3	12.0	428 235
Community health workers	15.3	15.5	0.1	13.6	486 186
Traditional and complementary medicine	0.2	26.9	1.2	1.4	49 742
Other health workers	9.6	14.1	8.2	9.7	345 028
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>3 573 697</b>

Within the public sector, the estimated proportion of laboratory workers was the highest at an estimated 97.6%. The proportion of the community health workers was the second-highest at 95.3%. The proportion of pharmacists and technicians was the highest occupation (28.2%) in the private not-for-profit sector and it was slightly higher than the proportion of medical imaging and equipment technicians (25.8%) in the private not-for-profit sector.

The findings further showed that the public sector contributed to about 85% of all the selected categories of the health workforce occupations assessed in the 2018 survey, while the private for-profit and private not-for-profit sectors contributed 4% and 11% of the health workforce respectively as shown in Table 6.

Table 6: Distribution of health workers by sector in 47 countries in the African Region in 2018

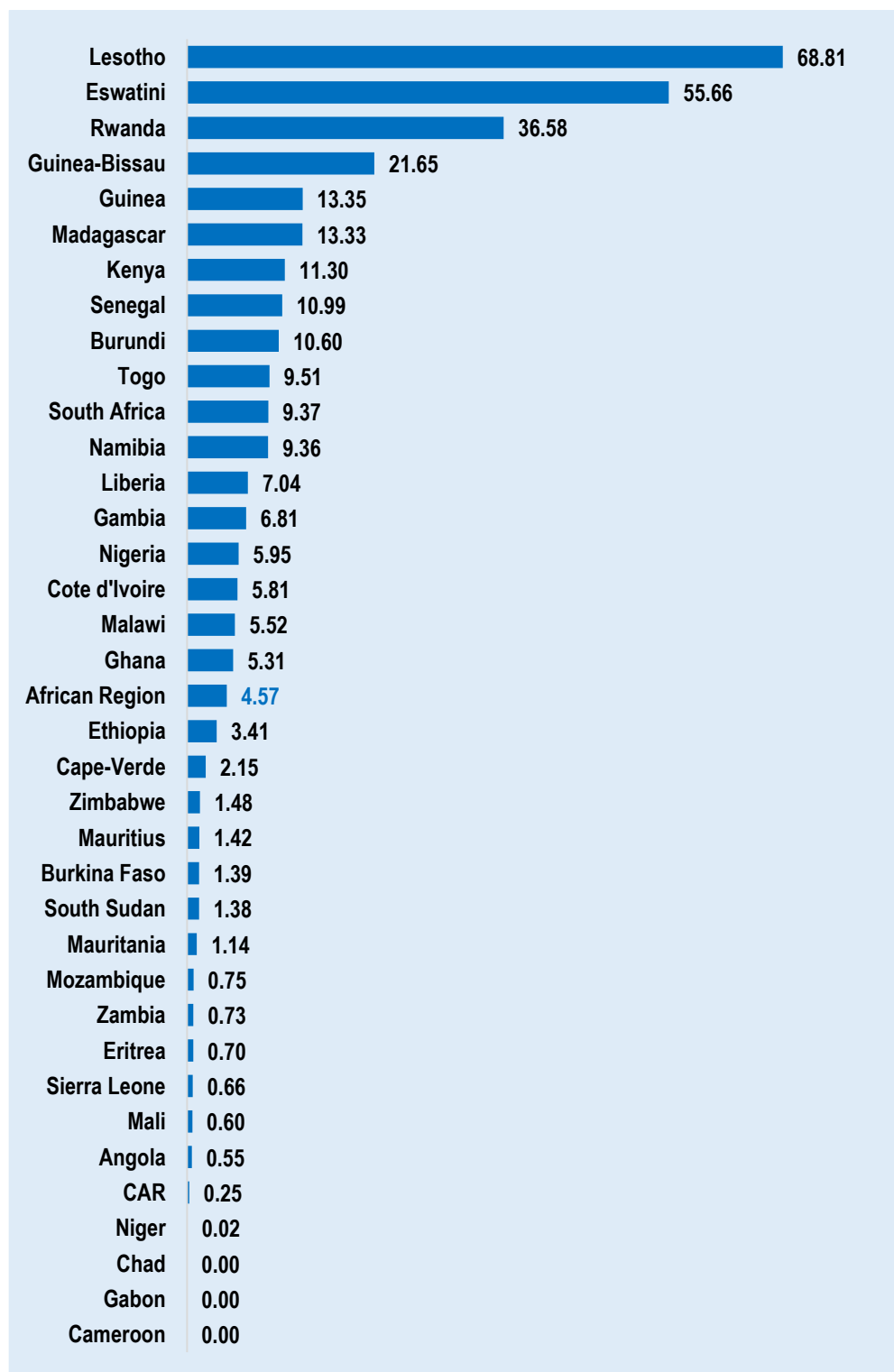
Categories	% Public	% Private for Profit	% Private not-for -profit	%Total	Total Number
Physician generalists	79.9	3.8	16.4	100	243 254
Physician specialists	74.2	1	24.8	100	90 913
Nurses	78.2	2.9	18.9	100	1 093 957
Midwives	95.2	2.2	2.6	100	217 551
Dentists and technicians	77.7	0.7	21.6	100	58 028
Pharmacists and technicians	70	1.9	28.2	100	94 098
Laboratory workers	97.6	1.2	1.3	100	370 104
Medical imaging and equipment technicians	71.4	2.8	25.8	100	25 804
Environment and public health workers	91.3	0.4	8.4	100	40 043
Health services managers	92.9	2.4	4.7	100	30 754
Administrative and support staff	91.1	2.2	6.8	100	428 235
Community health workers	95.3	4.7	0	100	486 186
Traditional and complementary medicine practitioners	10.8	79.3	9.9	100	49 742
Other health workers	84.6	6	9.4	100	345 028
<b>Total</b>	<b>84.80</b>	<b>4.11</b>	<b>11.09</b>	<b>100</b>	<b>3 573 697</b>

The proportion of physician generalists in the public sector has nearly doubled since 2005. The reported proportion of physician generalists in the public sector in 2018 was 84.9%, while in 2005, the proportion was 45% (based on 28 countries). The proportion of physician specialists increased in the public sector with an estimated 79% in 2018 (62% in 2005) and decreased for both the private for-profit (19.9% in 2018 compared to 36% in 2005) and private not-for-profit (1.3% in 2018 compared to 1.4% in 2005) sectors.

### 3.3 Community health workers

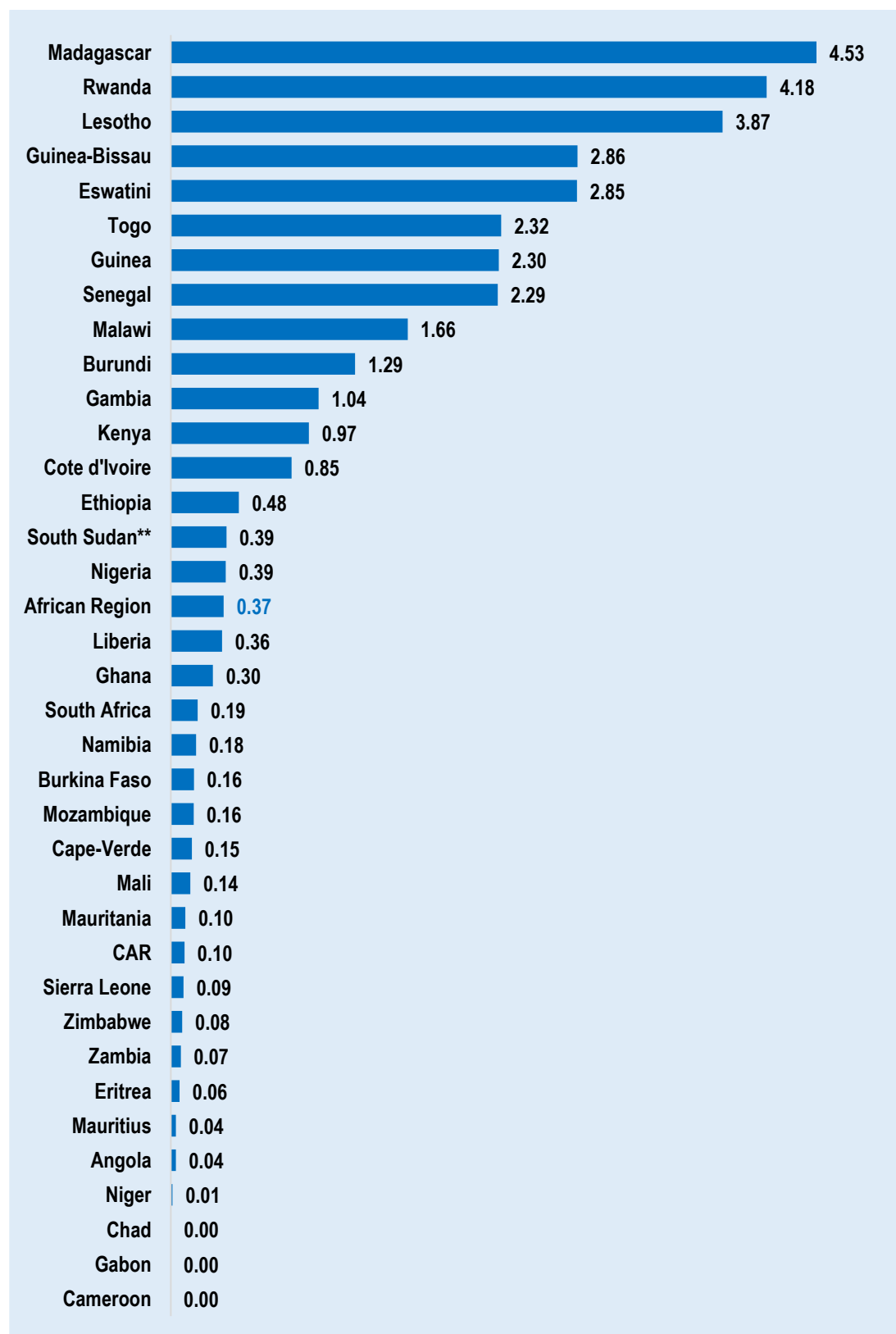
For community health workers, the average density in the African Region was 4.5 and 15 countries were above this average as shown in Figure 8. Eleven countries did not report any data on community health workers: Algeria, Benin, Botswana, Comoros, Democratic Republic of the Congo, Equatorial Guinea, Republic of the Congo, Seychelles, South Sudan, Uganda and United Republic of Tanzania.

Figure 8: Density of community health workers per 100 000 population in 2018 in 36 countries in the African Region



The ratio of community health workers to nurses and midwives was at least one in 13 countries, (figure 9). Algeria, Benin, Cameroon, Democratic Republic of the Congo, Gabon, Niger, Republic of the Congo, Uganda and United Republic of Tanzania did not provide data in the current survey.

Figure 9: Number of community health workers to one nurse/midwife in 2018 per country in the WHO African Region (36 countries)



## 4. REGIONAL HEALTH WORKFORCE THRESHOLD TOWARDS UHC

Although health workforce planning is an essential element in building responsive and efficient health systems, establishing acceptable, comprehensive and context-relevant benchmarks/thresholds that are directly linked to the stated health policy agenda has remained a challenge over the decades. While past efforts to develop benchmarks for health workforce needs across countries have been useful for advocacy and planning, they were neither country-specific nor disaggregated by cadre, mostly due to data inadequacies. The GSHRH, for which the WHO Regional Office for Africa developed an implementation framework, has provided a blueprint for interventions geared at resolving the health workforce crisis in the Region. Nevertheless, the capacity and resources to develop staffing norms and standards at the country level and to produce robust needs-based projections remain a challenge.

The WHO AFRO High-level Consultative Group on the Health Workforce (HLCG-HWF) in November 2019 strongly advised the Regional Office to conduct the necessary exploratory analysis towards an index of health workforce density that is directly linked to the realization of universal health coverage. It is also intended to be disaggregated, as far as possible, for the various cadres of the health workforce.

This chapter presents the health workforce threshold for at least 70% of the UHC service coverage index in the African Region. It is extracted from the Health workforce thresholds for supporting the attainment of universal health coverage in the African Region: Technical paper. Detailed information on the methodology applied in reaching the threshold is available in the aforementioned technical paper and a brief is presented in Annex 1 of this report.

### 4.1 HWF threshold for attaining at least 70% UHC service coverage index in the African Region

To estimate the aggregate health workforce threshold at which a given UHC service coverage index can be attained, the variables were held constant in the structural equation except, for the health workforce density which varied to determine the threshold at a given UHC target (for example, 60%, 70%, 80%, 90% and 100%).<sup>22</sup>

Table 7 shows a simulation of the HWF threshold at which various targets of UHC, ranging from 60% to 100%, are attainable using this model. The analysis shows that between 60% and 70% of UHC service coverage, a unit increase in the coverage index is associated with the need to increase the HWF density by an average of 9.2%. For a UHC service coverage index above 70% and up to 80%, a unit increase in the coverage index is associated with the need to increase HWF density by an average of 4.7%. Similarly, a UHC service coverage index above 80% and up to 90% is associated with an average 3.2% increase in HWF density, and then an average of 2.4% increase in HWF density for any unit increase in the UHC service coverage index beyond 90%. The above analysis suggests that massive increases in HWF density are needed to attain a minimum of 70% of the UHC service coverage index, a critical point after which marginal proportional increases in HWF density have an even higher rate of marginal return on UHC service coverage levels. However, given a larger denominator (the HWF numbers), the marginal proportional increases required for each unit increase in the UHC service coverage index beyond 70% may represent substantial jumps in the actual number of the HWF. From the foregoing, the rest of this analysis assumes 70% of UHC service coverage to be a critical point or milestone from the viewpoint of establishing a benchmark index of HWF needs.

<sup>22</sup> This simulation was conducted using the Solver add-in of Microsoft Excel® version 2019, adopting a non-linear Generalized Reduced Gradient (GRG) optimization.

Table 7: Simulated targets of the UHC service coverage index and the associated HWF threshold per 10 000 population

Various levels (targets) of UHC service coverage index	HWF threshold (Density) per 10 000 pop.	Marginal increase in HWF need	Average marginal increase in HWF density for various UHC milestones
56	29.31	Baseline data	
60	55.77		
61	63.62	14.1%	
62	71.46	12.3%	
63	79.31	11.0%	
64	87.15	9.9%	
65	95.00	9.0%	
66	102.85	8.3%	
67	110.69	7.6%	
68	118.54	7.1%	
69	126.38	6.6%	
70	134.23	6.2%	9.2%
71	142.07	5.8%	
72	149.92	5.5%	
73	157.76	5.2%	
74	165.61	5.0%	
75	173.46	4.7%	
76	181.30	4.5%	
77	189.15	4.3%	
78	196.99	4.1%	
79	204.84	4.0%	
80	212.68	3.8%	4.7%
81	220.53	3.7%	
82	228.38	3.6%	
83	236.22	3.4%	
84	244.07	3.3%	
85	251.91	3.2%	
86	259.76	3.1%	
87	267.60	3.0%	
88	275.45	2.9%	
89	283.29	2.8%	
90	291.14	2.8%	3.2%
91	298.99	2.7%	
92	306.83	2.6%	
93	314.68	2.6%	
94	322.52	2.5%	
95	330.37	2.4%	
96	338.21	2.4%	
97	346.06	2.3%	
98	353.91	2.3%	
99	361.75	2.2%	
100	369.60	2.2%	2.4%

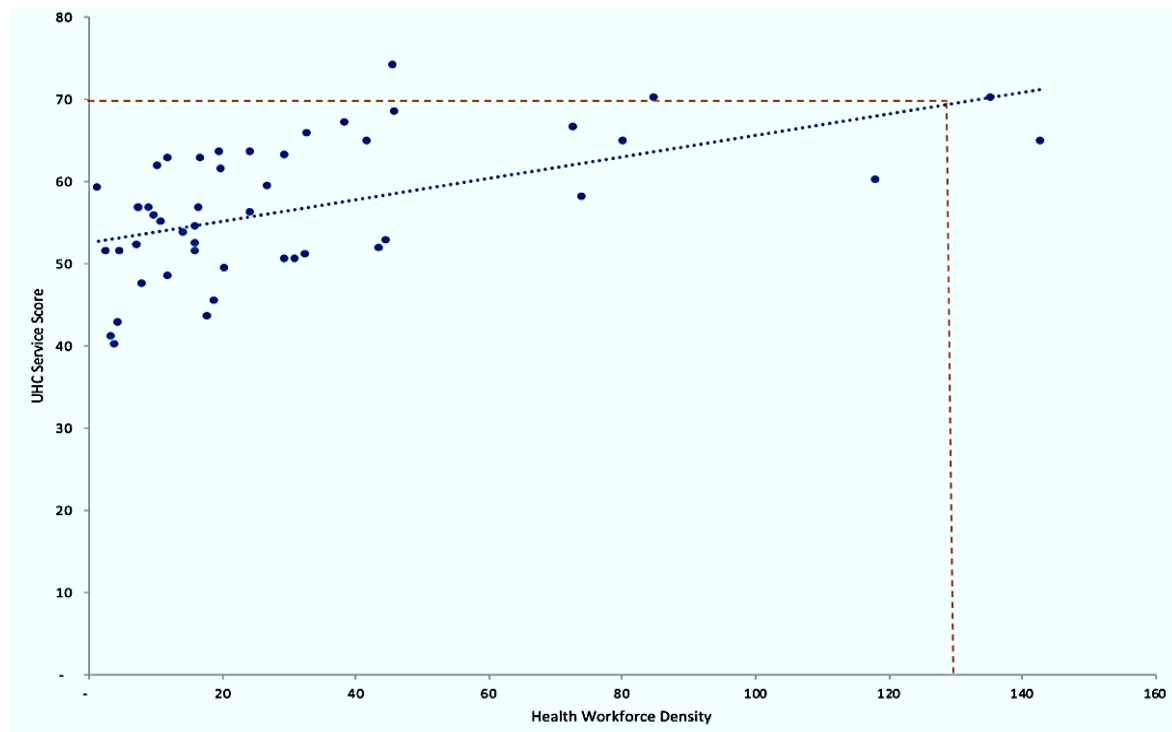
Considering the 13 categories of the health workforce included in this analysis, the countries in the WHO African Region, on average, require an aggregate of **13.42 health workers per 1000 population**, to enable the



progressive realization of **at least 70% of the UHC targets** (see Table 9 for details). However, excluding community health workers, the threshold is **10.9 health workers (comprising 12 categories) per 1000 population**.

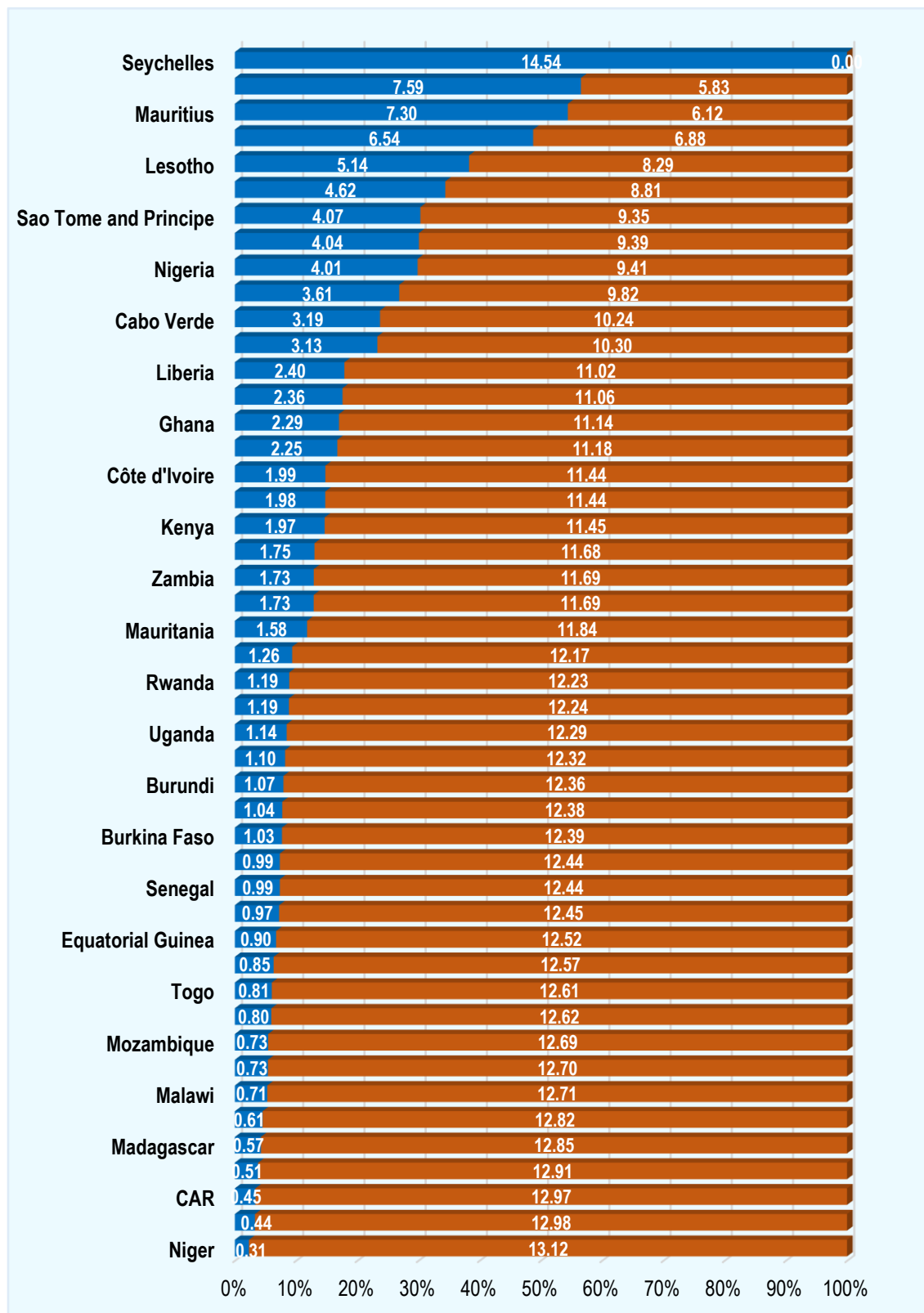
As a cross-check of the estimated threshold, the UHC service coverage indices of the countries were plotted against their current aggregate health workforce densities (comprising the 13 categories included). In this single predictor analysis, the UHC service coverage index of 70 also corresponded to approximately 136 health workers per 10 000 population (see Figure 10). The HWF density gap per country to reach 70% UHC service coverage in the African Region is presented in Figure 11.

Figure 10: Density of 13 cadres of HWF per 10 000 population vs the UHC service coverage index



Based on the profile of 13 categories of health workers in 2018 (excluding health managers and support staff), the survey showed that the average regional HWF density was 2.9 health workers per 1000 population. To enable the progressive realization of at least 70% of the UHC targets, the required density for the Region is estimated at 13.4 health workers per 1000 population. If community health workers are excluded, the density threshold for the 12 categories of health is 10.9 health workers per 1000 population. Among the countries in the African Region, only Seychelles has reached this threshold with 14.5 health workers per 1000 population, followed by Namibia (7.6), Mauritius (7.3), South Africa (6.5) and Lesotho (5.1). Eleven countries (Sierra Leone, Senegal, United Republic of Tanzania, Equatorial Guinea, Guinea, Togo, Cameroon, Mozambique, Mali, Malawi and South Sudan) showed a density between 0.5 and 1.0 health workers per 1000 population. Five countries (Madagascar, Benin, Central African Republic, Chad and Niger) showed a critical shortage, with their HWF density at less than 0.5 per 1000 population. As a result, massive increases in the health workforce are needed to attain a minimum coverage (70%) of UHC services in the African Region.

Figure 11: HWF density per 1000 pop and the gap to reach 70% UHC service coverage index



## 4.2 Simulating the optimal mix of health workforce cadres

Using Solver add-in in Microsoft® Excel and maintaining a non-linear GRG model, the model covariates were controlled, UHC service coverage index constrained at 70% and the various categories of health workers included in the analysis were simultaneously varied to examine an ‘optimum mix’ at which the UHC target is attainable. The results (Table 8) show that a mix of 0.78 doctors per 1000 population alongside 5.9 nurses and midwives per 1000 is necessary for the attainment of at least 70% of the UHC service coverage index. It will translate into a doctor to nurse/midwife ratio of one doctor to approximately seven to eight nurses (professionals and associates/auxiliaries alike). The HWF mix requires up to 2.5 community health workers per 1000 population while the other categories all make up 4.36 per 1000 population. Table 8 provides details of the density threshold of the various groups of health workers that together correspond to 70% of the UHC service coverage index.

Table 8: Mix of health workforce threshold by health worker occupational group

Health workers group	Average regional density per 1000 population in 2018	HWF density threshold per 1000 population for at least 70% UHC service coverage index	Proportion of the aggregate density threshold
Medical doctors (generalists and specialists)	0.33	0.78	5.8%
Nurses and midwives (professionals and associates)	1.40	5.90	43.7%
Dentists and dental technicians/assistants	0.07	0.53	3.9%
Pharmacists, pharmacy technicians /assistants	0.13	1.50	11.0%
Medical assistants/clinical officers/physician assistants	0.03	0.09	0.7%
Medical and pathology laboratory scientists/technicians	0.13	1.40	10.4%
Medical imaging and therapeutic equipment operators	0.03	0.08	0.6%
Physiotherapists and physiotherapy assistants	0.03	0.09	0.7%
Optometrists and opticians	0.01	0.03	0.2%
Paramedical practitioners	0.05	0.27	2.0%
Dieticians and nutritionists	0.01	0.01	0.1%
Environmental and occupational health and hygiene workers	0.05	0.29	2.2%
Community health workers	0.67	2.52	18.8%
All cadres	<b>2.93</b>	<b>13.42</b>	-

## 5. HEALTH EDUCATION, TRAINING AND ACCREDITATION

### 5.1 Health training institutions

There are 3894 health training institutions in the Region based on the 2018 survey. Of this number, 2128 (55%) are owned by the public sector, 1351 (35%) by the private for-profit sector, and 415 (11%) by the private not-for-profit sector. The public sector reported the highest number of medical training institutions for medical practitioners, dentists and pharmacists which stood at 209 institutions, accounting for 59%, compared to the private for-profit and private not-for-profit sectors, which reported a total of 111 (31%) and 35 (10%) training institutions respectively, for medical practitioners, dentists and pharmacists.

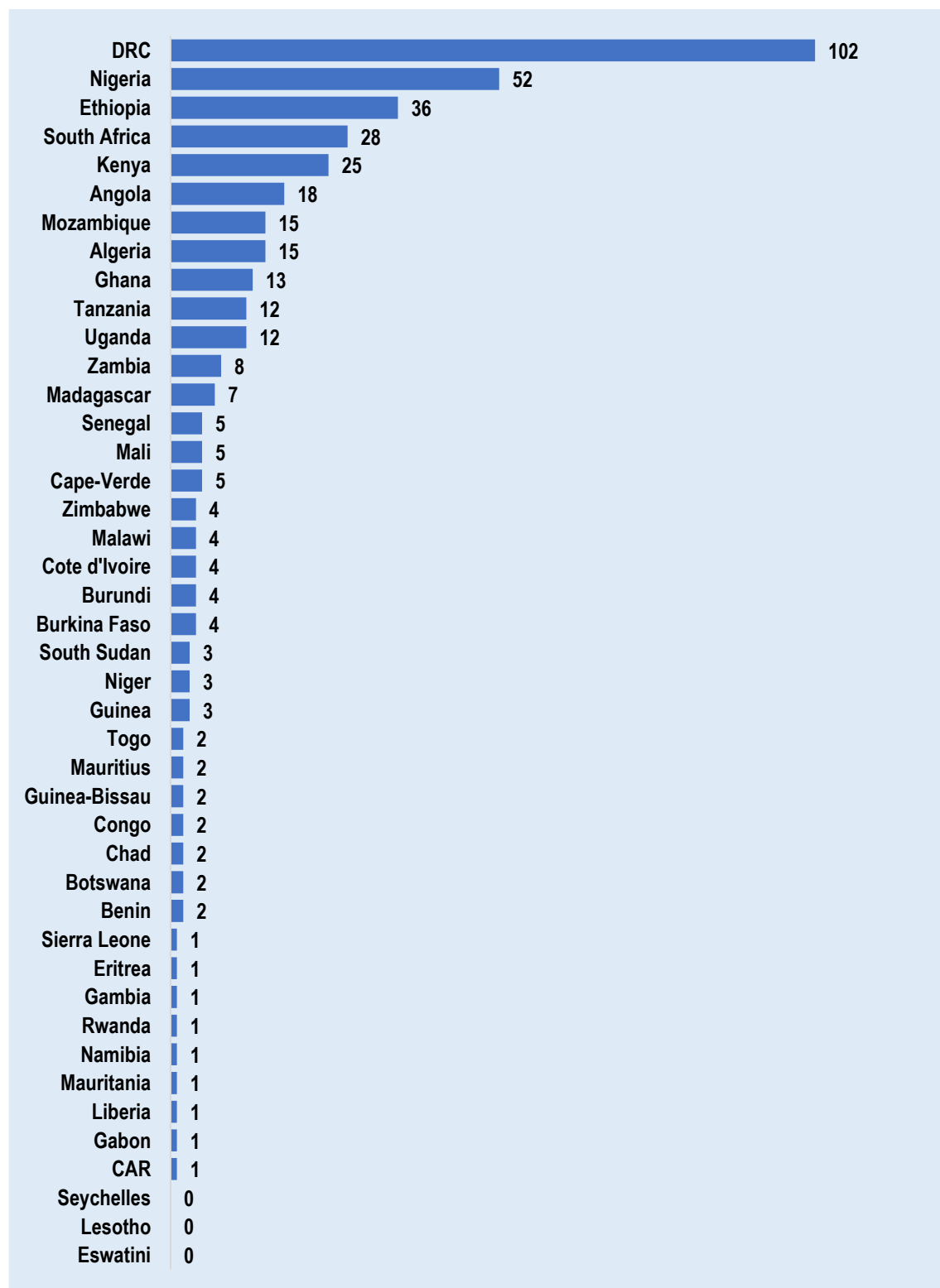
The public sector had the highest number for both nursing and midwifery training institutions with a total of 1375 institutions (54%) and health sciences schools for other mid-level cadres with a total of 544 (55%).

*Table 9: Number and percentage of health training institutions by sector in 39 countries in the African Region in 2018*

Training institutions	Public		Private for-profit		Private not-for-profit		Total	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Medical training institutions	209	(59)	111	(31)	35	(10)	355	(100)
Health sciences schools	544	(55)	363	(37)	84	(8)	991	(100)
Nursing and midwifery schools/colleges	1375	(54)	877	(34)	296	(12)	2548	(100)
<b>Total</b>	<b>2 128</b>	<b>(55)</b>	<b>1 351</b>	<b>(35)</b>	<b>415</b>	<b>(11)</b>	<b>3 894</b>	<b>(100)</b>

Figure 12 below shows that there were 355 medical training institutions for medical practitioners, dentists and pharmacists, with the highest number of medical training institutions recorded for the Democratic Republic of the Congo (102). Seychelles, Lesotho and Eswatini do not have a medical training institution.

Figure 12: Medical training institutions for medical practitioners, dentists and pharmacists

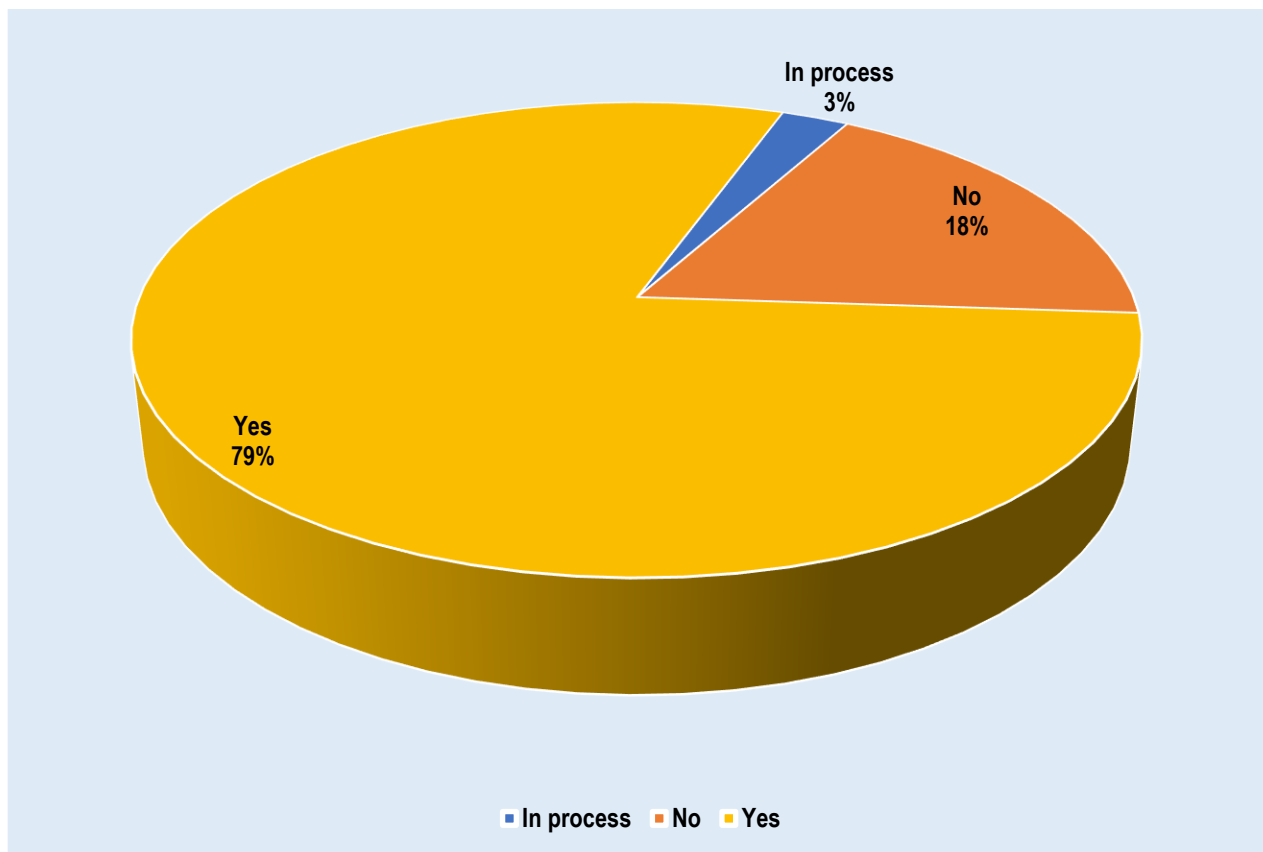


Note: No data reported for Cameroon, Comoros, Equatorial Guinea, Sao Tome and Principe

## 5.2 Accreditation of health training institutions

The GSHRH emphasizes the importance of strengthening the capacity and quality of educational institutions through the accreditation of training schools and certification of diplomas awarded to health workers.<sup>1</sup> The Global strategy states that by 2020, all countries will have established accreditation mechanisms for health training institutions. Conversely, the African regional framework for the implementation of the GSHRH targets 2022 as the year when at least 50% of Member States will have established accreditation mechanisms for health training institutions. The results for the regional survey in Figure 13 shows that in 2018, thirty-one (79%) had an accreditation body for training institutions, whereas seven countries (18%) had none<sup>23</sup> and one country (Chad) was in the process of establishing one. Six countries (Comoros, Gambia, Equatorial Guinea, Kenya, South Africa and South Sudan) did not provide data.

Figure 13: Number of countries with an accreditation body for health training institutions in the African Region in 2018 (N = 39)



<sup>23</sup> Seven countries with no accreditation mechanisms: Algeria, Benin, Burkina Faso, Congo, Mali, Mauritania and Togo

## 6. EMPLOYMENT AND WORKING CONDITIONS

### 6.1 Recruitment trends in the public sector

SDG 3, target 3.c seeks to increase the recruitment of the health workforce.<sup>10</sup> Various investments and efforts have been made to increase the recruitment of health workers across the African Region. The results in table 10 below show that there was generally an increase in the number of health workers recruited in the public sector in the WHO African Region from 2015 to 2016 (48 482 to 89 763 health workers). The number of recruited health workers, however, dropped in 2017 (76 693 health workers). The highest decrease in the number of recruited health workers was observed for nurses and midwives.

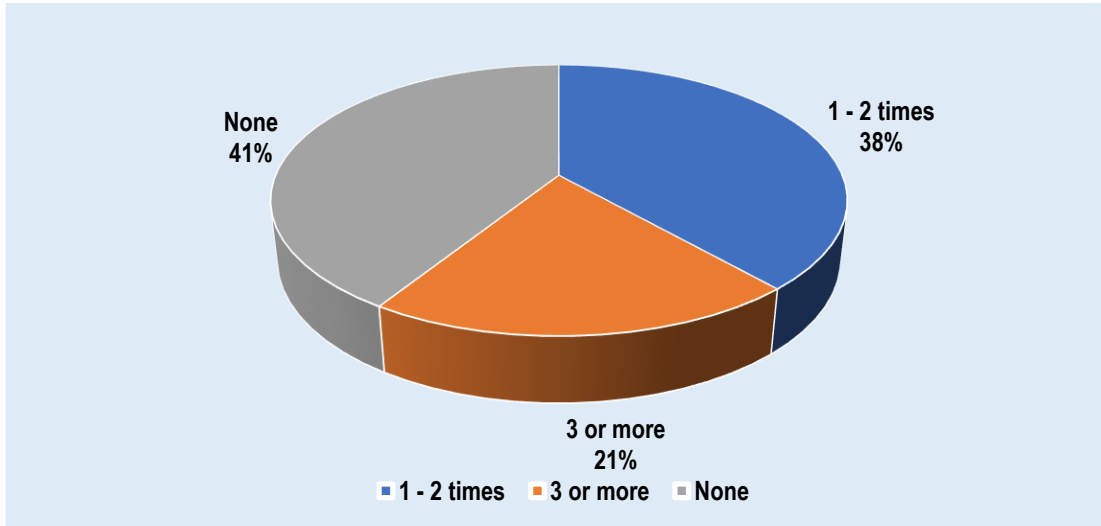
Table 10: Recruitment in the public sector in 2015, 2016 and 2017

Health occupational categories/cadres	Recruitment trends in the public sector (absolute number)		
	2015	2016	2017
Physician generalists	3 464	6 166	6 319
Physician specialists	659	2314	2446
Medical Assistants/Clinical officers	4 293	5 153	5 095
Nurses/Midwives	19 110	50 613	34 112
Dentists and technicians	266	593	536
Pharmacists and technicians	1 797	2 060	2 290
Laboratory scientists/technicians	2 514	5 503	3 947
Other health workers	16 379	17 361	21 948
<b>Total</b>	<b>48 482</b>	<b>89 763</b>	<b>76 693</b>

## 6.2 Working conditions

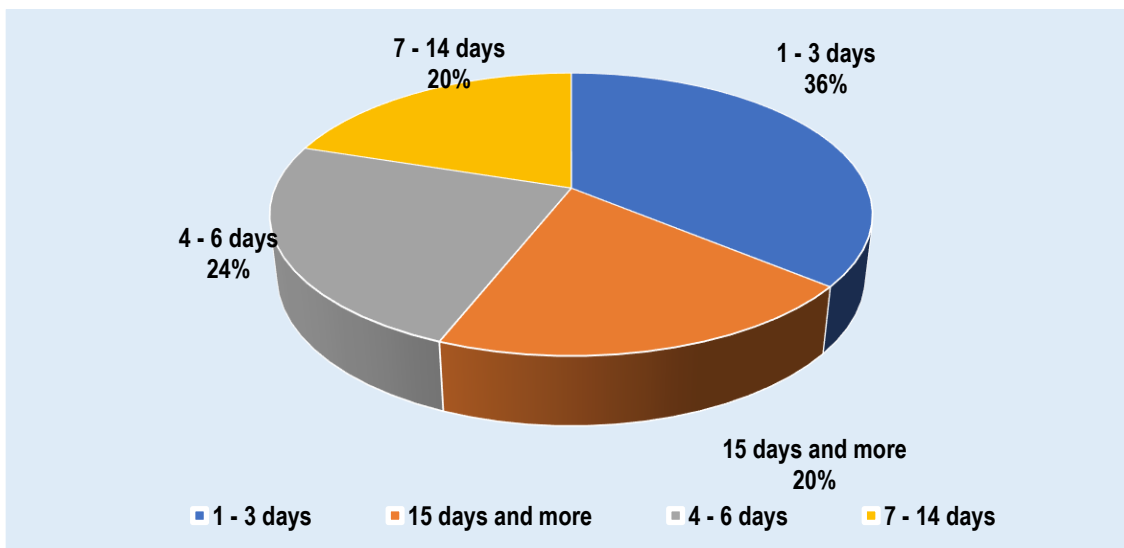
Figure 14 shows that 15 out of 39 countries (38%) in the WHO African Region had health worker strikes once or twice, in the last 12 months before the survey, whereas eight countries (21%) had such strikes three or more times in the last 12 months before the survey.

Figure 14: Number and percentage of health worker strikes in the African Region 12 months before the survey



Furthermore, results showed that nine out of 25 countries (36%) in the WHO African Region reported that health worker strikes lasted for one to three days, while five other countries (20%) reported that they lasted for 15 days and more, on average. Meanwhile, six countries (24%) reported that health worker strikes lasted between four and six days on average, and in five countries (20%) the strikes lasted between seven and 14 days on average.

Figure 15: Average duration of health worker strikes in days in the African Region (N = 25)



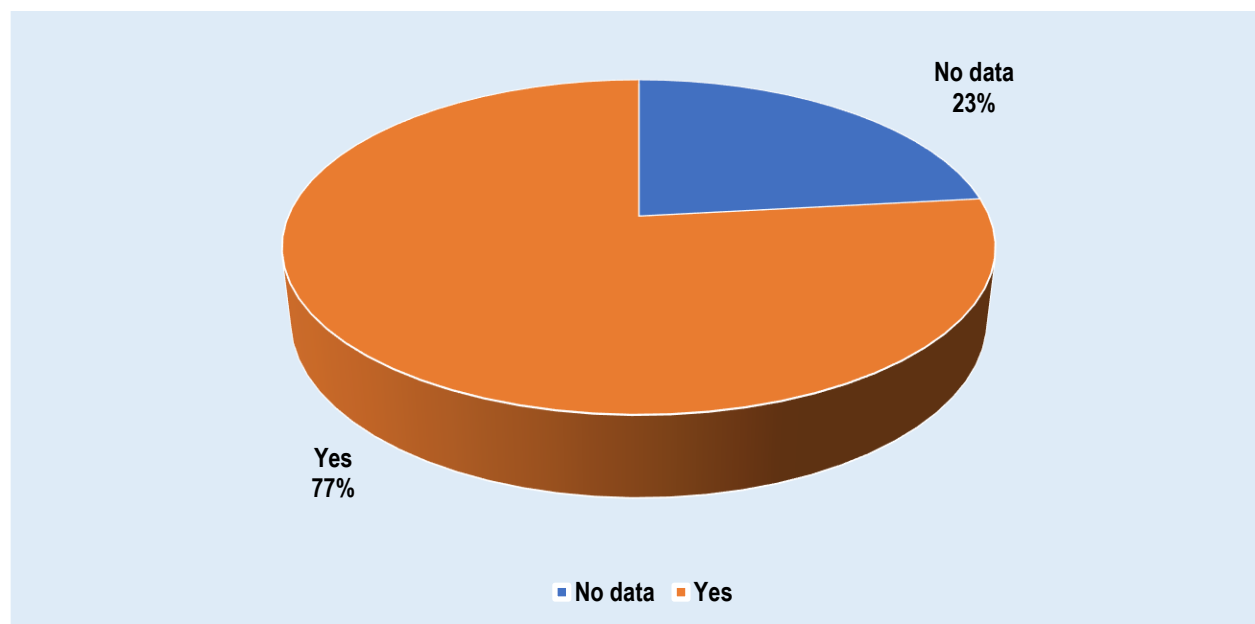
Additionally, the survey findings showed that 16 out of 23 countries (70%) reported that health worker strikes occurred often locally, while six countries (26%) reported that the strikes often occurred across the country. One country, Cabo Verde, did not provide data on this aspect.



### 6.3 Availability of conflict resolution mechanisms

The results in figure 16 show that 33 out of 43 countries (77%) in the WHO African Region reported that they had a conflict resolution mechanism in 2018. Ten countries did not provide data.

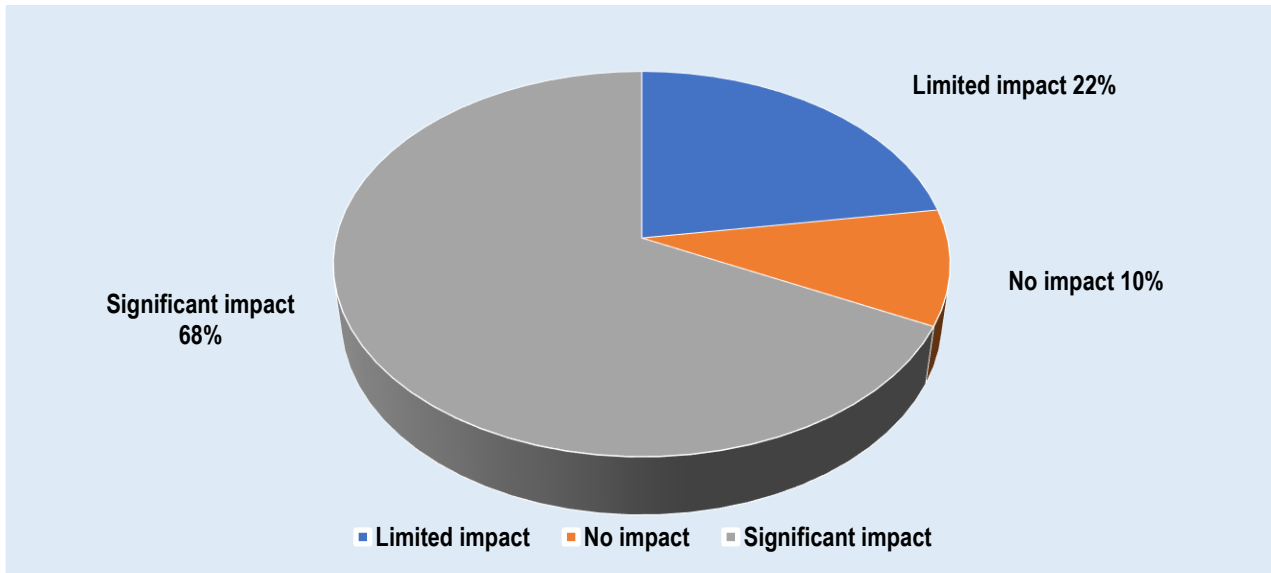
Figure 16: Availability of conflict resolution mechanisms in the African Region (N = 43)



### 6.4 Impact of health worker strikes on the functioning of health facilities

The results in figure 17 show that 21 out of 31 countries (68%) in the African Region reported that the health worker strikes had a significant impact on the functioning of health facilities, while seven countries (22%) reported that the strikes had limited impact. Three countries (10%) reported that health worker strikes had no impact at all on the functioning of health facilities.

Figure 17: Impact of health worker strikes on the functioning of health facilities in the African Region (N = 31)



### 6.5 Dual practices and regulation

A total of 20 out of 39 countries (51%) in the WHO African Region reported that they did not allow dual employment for health workers. On the other hand, 18 countries (46%) reported that they allowed dual employment. For instance, staff could be working full time in the public sector and at the same time practising in the private sector. Nineteen countries (49%) also reported having in place mechanisms or a policy to regulate dual employment practice, and 16 countries (41%) reported that they did not have any mechanisms or policy to regulate the dual practice. About two countries (5%) (Côte d'Ivoire and Zimbabwe) were in the process of putting in place mechanisms or a policy to regulate dual employment practice. There was no data for one country (Ghana) regarding dual employment status and mechanisms or policy on the same.

## 7. GOVERNANCE AND MANAGEMENT OF HEALTH WORKFORCE

### 7.1 HRH department/directorate functions and capacity

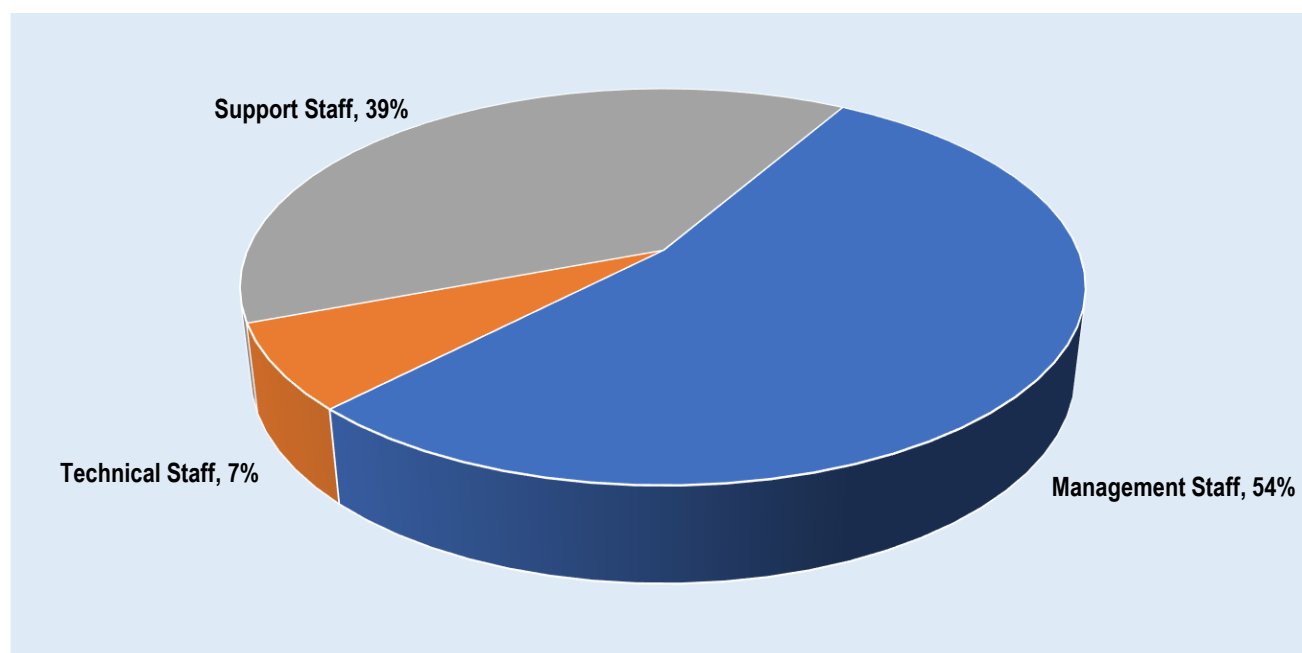
Thirty-nine countries within the WHO African Region, reported that they had an HRH department or directorate at the ministry of health, responsible for developing, implementing and monitoring HRH strategies. The main functions of the HRH department/unit/team included HRH planning, personnel administration, HRH information system, HRH policy development and training and development in at least 35 countries in the African Region (Table 11).

Table 11: Main functions of the HRH department/unit/team in the African Region

Main functions of the HRH department/unit/team	Number of countries	Percentage performing function
HRH policy development	38	15
HRH planning	39	15
Personnel administration	38	15
Training and development	38	15
HRH information system	38	15
Research, studies, documentation	29	11
Monitoring and evaluation	35	14

The capacity of the HRH department, according to the type of staff, showed that the majority were management staff, comprising 54% (103 172) of total staff, followed by support staff with about 39% (74 901) as presented in Figure 18. Technical staff constituted 7% (13 400) of the total staff.

Figure 18: Staffing levels of the HRH department/unit

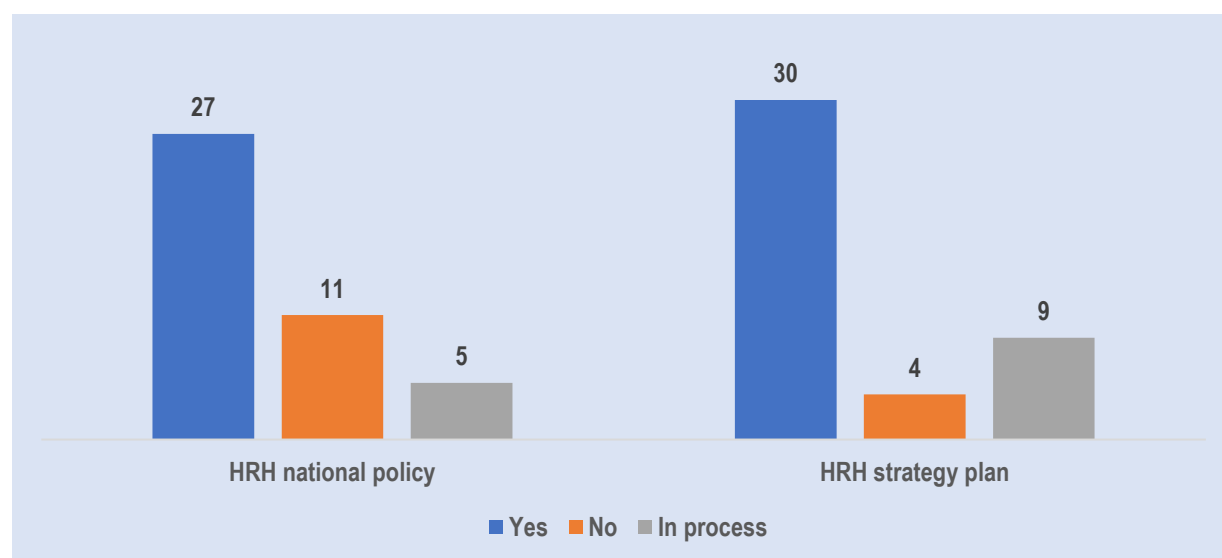


## 7.2 Policy development, planning and management for HRH

### 7.2.1 Availability of national HRH policy and strategic plan

The survey assessed the availability of a national HRH policy and strategic plan in all countries of the WHO African Region. Results (figure 19) show that 27 out of 43 countries (63%) that provided data reported that they had a national HRH health policy, while 11 countries (26%) reported otherwise, and five countries reported that they were in the process of developing one (11%). On the other hand, 30 countries (70%) reported that they had an HRH strategic plan, nine (21%) countries were in the process of developing an HRH strategic plan and four countries did not have an HRH strategic plan.

Figure 19: Status of countries on having a national HRH policy and strategic plan (N=43)

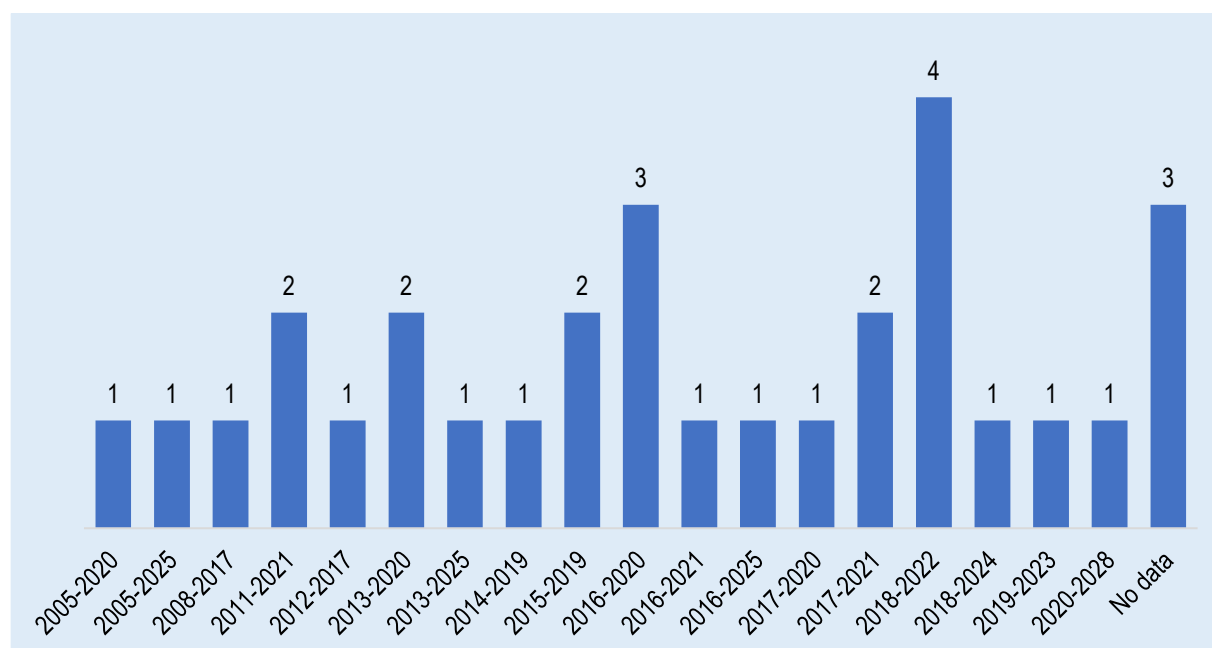


### 7.2.2 Period covered by the HRH strategic plan

All the 30 countries that reported having an existing HRH strategic plan were asked to indicate the period covered by the plan. In general, the period for the HRH strategic plans in the African Region ranged from four to 15 years.

Figure 20 shows that four out of 30 countries (13.3%) reported that their strategic plans covered the period 2018–2022. Two countries reported that their strategic plan covered the period 2005–2025 (15 years). Three countries did not provide data.

Figure 20: Period covered by the current HRH plan (N = 30)



### 7.2.3 Quality of the HRH strategic plan

Twenty-five of the 30 countries (83%) reported that their strategic plan was costed and 27 countries (90%) reported that their HRH strategic plan was linked to the national development plan (table 12). Additionally, 24 countries linked their HRH strategic plan to the WHO regional road map for scaling up HRH or the GSHRH (80%) and 29 countries linked their HRH strategic plan to their health policy/strategic plan (97%).

Table 12: Quality of the HRH strategic plan in the African Region

HRH strategic plan	Responses by countries			
	Yes	No	No data	Total
Costed	25	5	0	30
Linked to an overall national development plan	27	2	1	30
Linked to the WHO regional road map for scaling up HRH or the GSHRH	24	6	0	30
Linked to a national health policy/strategic plan	29	1	0	30
Being implemented	28	2	0	30
Includes projections of the HRH needs/demand	24	6	0	30
Projections cover the public and private sectors	11	16	3	30

### 7.2.4 Implementation of HRH strategic plan

Out of the 30 countries that reported in 2019 to have an HRH strategic plan, 28 indicated that the strategic plan was being implemented, while two reported that their HRH strategic plan was not being implemented. The 2006 regional survey reported that 16 countries had an HRH strategic plan in 2003 with only 10 being in the process of

implementing their plan, five were not implementing their plan, and one did not provide any information on the status of implementation.

Table 13 shows that 28 (93%) of the 30 countries reported that the most supported HRH development activities were policy and plan development and HRH information system/registry, while task shifting was reported as the least supported activity by 17 countries (57%).

Table 13: Types of HRH development activities supported by partners in the strategic plan

Activities in the strategic plan	Responses by countries			
	Yes	No	No data	Total
Policy and plan development	28	1	1	30
Pre-service training/fellowships	26	3	1	30
Training capacity (infrastructure)	27	2	1	30
In-service training	27	2	1	30
Recruitment	21	8	1	30
Incentive schemes	23	7	0	30
HRH information system/registry	28	2	0	30
National health workforce observatory	24	5	1	30
National health workforce accounts	18	11	1	30
Management capacity	25	5	0	30
Staffing norms development	22	7	0	29
Distribution and deployment	18	10	2	30
Community health workers	25	4	1	30
Task shifting	17	12	1	30
HRH studies/reviews	21	7	2	30

Results further showed that 11 out of the 30 countries (37%) reported that they had an investment case study for HRH and 19 countries (63%) were committed to ensuring increased resource allocation from national resources for the implementation of the HRH strategic plan (Table 14).

Table 14: Countries with investment case study and a commitment to increase allocation for HRH

Investment case study and commitment to increase allocation	Yes	No	No data	Total
Existence of an investment case study for HRH	11	18	1	30
There is commitment towards increased allocation from national resources for plan implementation	19	9	2	30

### 7.3 Infrastructure and finance

Of the 42 HRH departments that were assessed in the current survey, 23 (54.8%) reported that they did not have adequate office space, as shown in table 15. Additionally, 27 HRH departments (64.3 %) reported that they had adequate tools, such as computers and software for the human resource information system (HRIS), and reliable internet access. Also, 29 HRH departments (69%) reported that they had a specific budget allocation earmarked for departmental activities.

Table 15: Infrastructure and financing of HRH departments in the African Region

Category	Yes number (%)	No number (%)	No data number (%)	Total number (%)
Adequate office space for the HRH department	19 (45.2)	23 (54.8)	-	42 (100)
Adequate tools, computers and software for the HRIS	27 (64.3)	14 (33.3)	1 (2.4)	42 (100)
Reliable internet access	28 (66.7)	14 (33.3)	-	42 (100)
Specific budget for activities	29 (69.0)	13 (31.0)	-	42 (100)

#### 7.4 HRH information system capacity

As of 2018, out of a total of 43 countries where data was collected, only nine (20.9%) had their national health workforce accounts (NHWA) implemented, while 16 countries (37.2%) had no NHWA, 13 countries (30.2%) were in the process of establishing their NHWA and five (11.6%) had planned to establish one, as presented in Table 16. The results also show that 29 countries (67.4%) had an HRIS or a registry with a regularly updated database. Seven countries (16.3%) (Botswana, Central African Republic, Guinea-Bissau, Guinea, Malawi, Seychelles and South Sudan) had no functional HRIS or a registry with an updated database. Only five countries (11.6%) (Chad, Gambia, Congo, Nigeria and Sao Tome and Principe) were in the process of developing their HRIS and two countries (5.1%) (Madagascar and Mauritius) had plans to establish an HRIS or a registry with an updated database.

Table 16: Existence of information system capacity in 43 countries in the African Region

Description	Yes number (%)	No number (%)	In process number (%)	Planned number (%)	Total number (%)
Countries that have established their National health workforce accounts (NHWA)	9 (20.9)	16 (37.2)	13 (30.2)	5 (11.6)	43 (100)
Countries have a functional Human Resources for Health Information System or a registry with regularly updated database	29 (67.4)	7 (16.3)	5 (11.6)	2 (4.7)	43 (100)

#### 7.5 Multisectoral collaboration for HRH

Further analysis focused on assessing whether in the WHO African Region, the respective Member States have a national health workforce observatory that is functional. Nine countries (23.1%) reported that they had a functional national health workforce observatory, while 12 countries (30.8%) reported that they did not have one, as shown in table 17.

Table 17: Existence of the national health workforce observatory in the African Region

Functional	Not functional	In process	Doesn't exist	Total
9	12	6	16	43
21%	28%	14%	37%	100%

\*Countries with a functional national health workforce observatory: Angola, Benin, Cameroon, Democratic Republic of the Congo, Ghana, Mozambique, Togo, United Republic of Tanzania and Zimbabwe.

## 8. ROLES AND CAPACITIES OF HEALTH PROFESSIONAL BODIES

A total of 132 professional bodies in 39 countries in the WHO African Region responded to questions in this survey regarding their roles and capacities. Only 16.7% (22) of them reported that they had an outstanding regular performance appraisal for their board members, while 30.3% (40) reported that they did not perform regular performance appraisals for their board members. Furthermore, the results show that 53.3% (73) of the professional bodies reported that they had a satisfactory criterion for the selection and appointment of senior officials and board members, while 5.3% of them reported that they had no criteria to that effect.

Results also show that about 56.5% (70) of the professional bodies had mechanisms in place to detect fraudulent applications, while 4.8% (6) of them reported that they did not have one. The majority of them rated satisfactory (43.1% (56)) or outstanding (30.8% (40)) on having only persons who met the stipulated criteria for licensure and who could practise as health professionals. In addition, 51.6% (63) of them rated satisfactory that their registration renewal procedures were efficient and effective. Also, most of them (44.4% (55)) rated satisfactory on ensuring that educational programmes were aligned with the competencies required by registrants for fitness to practise. The survey also showed that 27.4% (32) of the health professional bodies had efficient and effective processes relating to health professionals wishing to migrate, with 21.4% (25) rating the processes as outstanding. Thus, nearly half of the bodies gave at least a satisfactory rating, with 48.4% (59) of them rating as outstanding the use of a medical or nursing council Act in their work (Table 18).

On licensing and implementation status, a total number of 338 824 licences were issued in 2017, and in the same year, very few sanctions (0.2% (689)) were enforced for non-observance of standards and non-compliance with codes of conduct.



Table 18: Roles and capacities of health professional bodies in the African Region

Capacity	Number of professional bodies	Lacking Number (%)	Weak Number (%)	Average Number (%)	Satisfactory Number (%)	Outstanding Number (%)
Board members are subjected to regular performance appraisal	142	47 (33.1)	15 (10.6)	18 (12.7)	40 (28.2)	22 (15.5)
Bodies with available criteria for the selection and appointment of senior officials and board members	141	9 (6.4)	12 (8.5)	12 (8.5)	73 (51.8)	35 (24.8)
Bodies with mechanisms in place to detect fraudulent applications	132	6 (4.5)	15 (11.4)	18 (13.6)	71 (53.8)	22 (16.7)
Bodies with only persons who meet stipulated criteria for licensure and can practise as health professionals	137	9 (6.6)	19 (13.9)	12 (8.8)	57 (41.6)	40 (29.2)
Bodies where registration renewal procedures are efficient and effective	131	14 (10.7)	11 (8.4)	15 (11.4)	63 (48.1)	28 (21.4)
Bodies that ensure educational programmes are aligned with the competences required by registrants for fitness to practice	132	12 (9.1)	31 (23.5)	16 (12.1)	55 (41.7)	18 (13.6)
Bodies with efficient and effective processes relating to health professionals wishing to migrate	124	26 (21.0)	16 (12.9)	25 (20.2)	32 (25.8)	25 (20.2)
Bodies making use of a medical or nursing council act	130	15 (11.5)	11 (8.5)	9 (6.9)	36 (27.7)	59 (45.4)

## 9. HEALTH WORKFORCE COUNTRY PROFILES

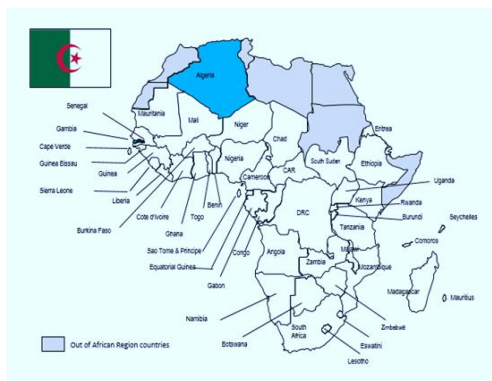
The HRH country profiles presented in this section provide country-specific overviews of the key health indicators and the health workforce status. The information on health status was obtained from the Atlas of African health statistics 2018.<sup>24</sup> The information presented under the key health indicators are crude birth rates per 1000 mid-year total population, crude death rates per 1000 mid-year total population, under-five mortality rate and maternal mortality ratio per 100 000 live births.

Information on the health workforce status was obtained from the synthesis of completed country survey tools and other data sources, including the NHWA. The indicators presented here track the stock, densities and distribution of nine health worker groups – community health workers; environmental and public health professionals; management and support staff; dentists and technicians; pharmacists and technicians; laboratory technicians; nurses and midwives; physicians; and other health workers – based on the 2005 and 2018 findings.

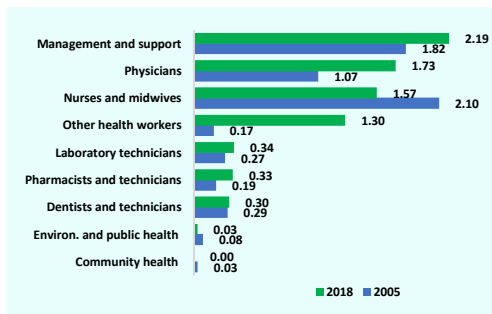
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<sup>24</sup> World Health Organization. Regional Office for Africa. (2018). Atlas of African health statistics 2018: Universal health coverage and the Sustainable Development Goals in the WHO African Region. World Health Organization. Regional Office for Africa. <https://apps.who.int/iris/handle/10665/311460>.

### Algeria



Density of HWF per 1000 pop in 2005 & 2018

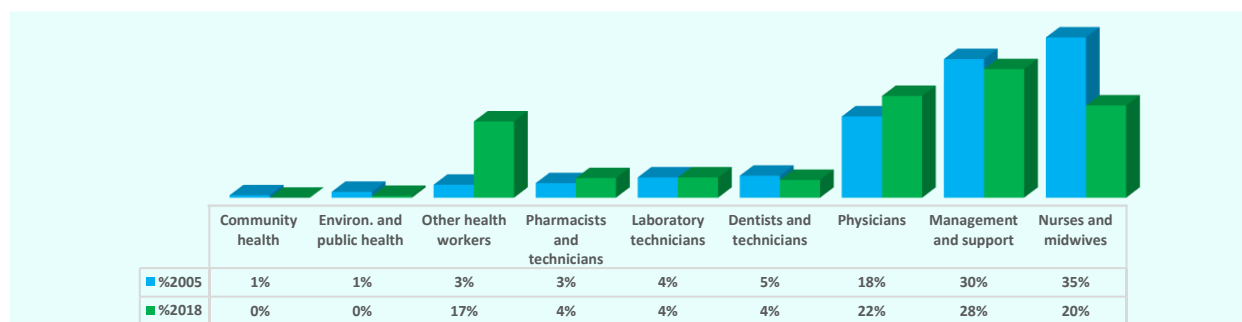


Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	23.9
Crude death rates per 1000 mid-year total population	4.8
Under-five mortality rate	25.5
Maternal mortality ratio per 100 000 live births	140.0

Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.57
Density of physicians per 1000 population	1.73
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	3.29
% nurses/midwives out of total health workforce	20.13
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	0.91
Existence of investment case study for HRH	Yes
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018



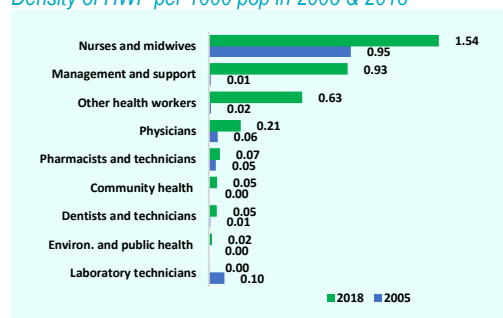
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005–2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	35 368	18	73 168	22	107	8
Nurses and midwives	69 749	35	66 325	20	-5	0
Dentists and technicians	9 553	5	12 781	4	34	3
Pharmacists and technicians	6 333	3	14 106	4	123	9
Environmental and public health workers	2 534	1	1 249	0	-51	-4
Laboratory technicians	8 838	4	14 548	4	65	5
Community health workers	1 062	1	0	0	-100	-8
Management and support workers	60 316	30	10 838	3	-82	-6
Other health workers	5 654	3	136 479	41	2,314	178
Total	199 407	100	329 494	100	65	5

## Angola



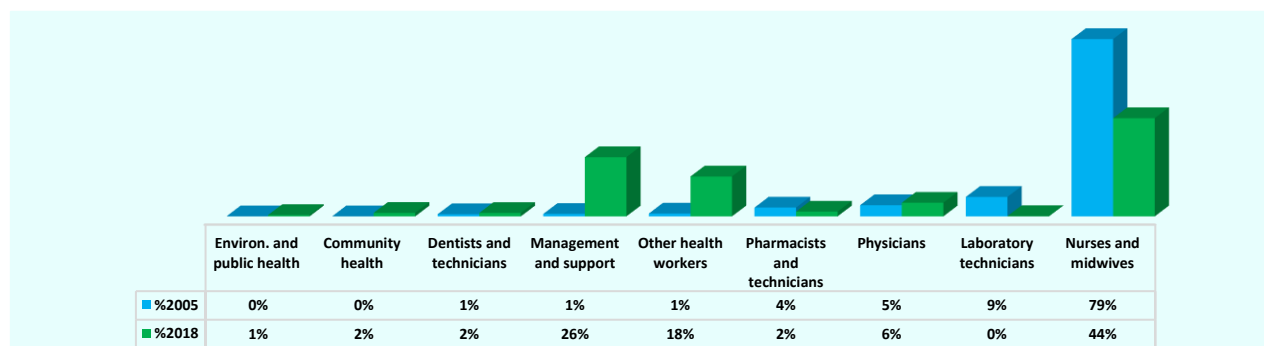
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	42.3
Crude death rates per 1000 mid-year total population	8.7
Under-five mortality rate	156.9
Maternal mortality ratio per 100 000 live births	477.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.54
Density of physicians per 1000 population	0.21
Density of CHWs per 10 000 population	0.05
% of health managers out of total health workforce	0.30
% nurses/midwives out of total health workforce	43.81
Community health worker to nurse/midwife ratio	0.04
Nurse/midwife to physician ratio	7.21
Existence of investment case study for HRH	Yes
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	Yes
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	Yes
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

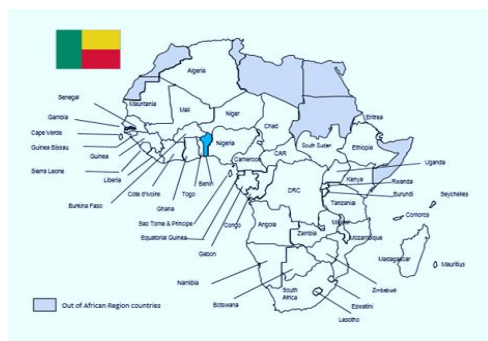
Health Workers in 2005 and 2018



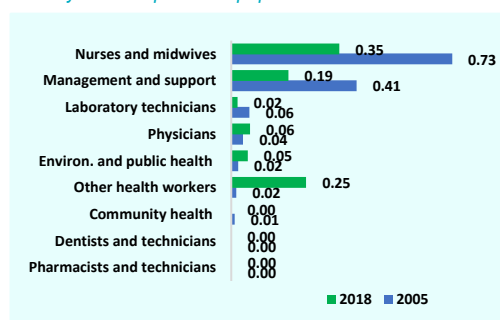
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	1 165	5	6 593	6	466	36
Nurses and midwives	18 485	79	47 520	44	157	12
Dentists and technicians	222	1	1 652	2	644	50
Pharmacists and technicians	919	4	2 302	2	150	12
Environmental and public health workers	0	0	657	1	-	-
Laboratory technicians	2 029	9	98	0	-95	-7
Community health workers	0	0	1 680	2	-	-
Management and support workers	256	1	328	0	28	2
Other health workers	294	1	47 628	44	16 100	1 238
Total	23 370	100	108 458	100	364	28

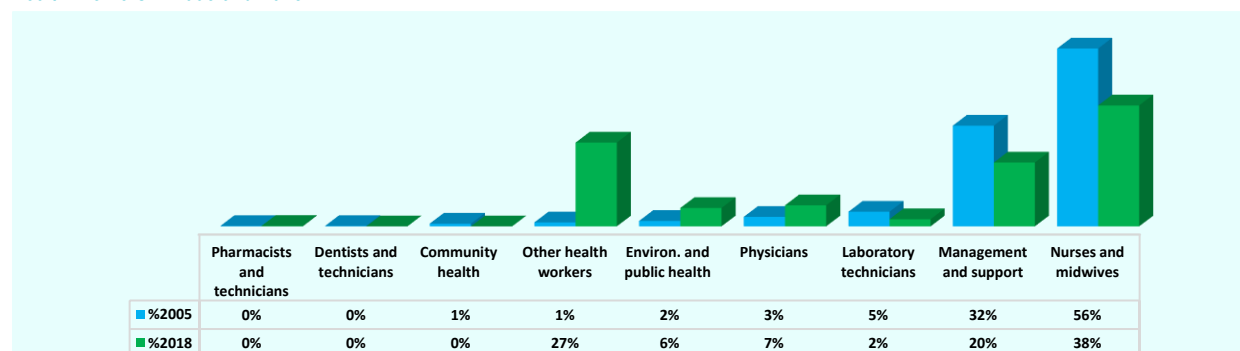
### Benin



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



Health Workers in 2005 and 2018

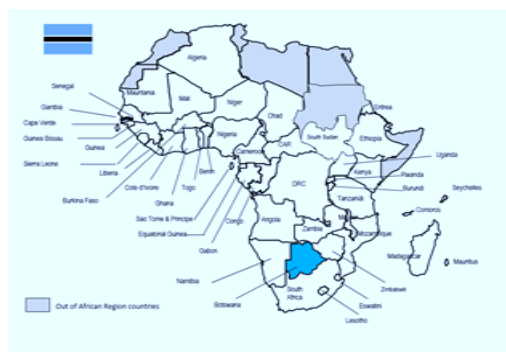
Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	311	3	710	7	128	10
Nurses and midwives	5 789	56	4 073	38	-30	-2
Dentists and technicians	12	0	0	0	-100	-8
Pharmacists and technicians	11	0	14	0	27	2
Environmental and public health workers	178	2	619	6	248	19
Laboratory technicians	477	5	241	2	-49	-4
Community health workers	88	1	0	0	-100	-8
Management and support workers	3 279	32	0	0	-100	-8
Other health workers	130	1	4 973	47	3 725	287
Total	10 275	100	10 630	100	3	0

Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	37.4
Crude death rates per 1000 mid-year total population	9.3
Under-five mortality rate	99.5
Maternal mortality ratio per 100 000 live births	405.0

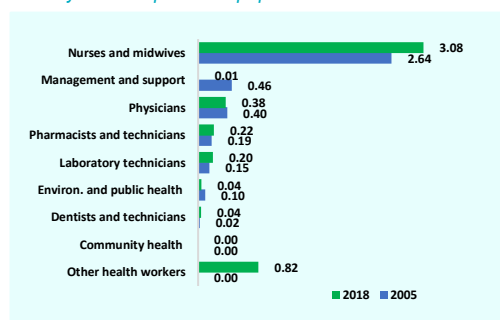
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.35
Density of physicians per 1000 population	0.06
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	38.32
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	5.74
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	Yes
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

### Botswana



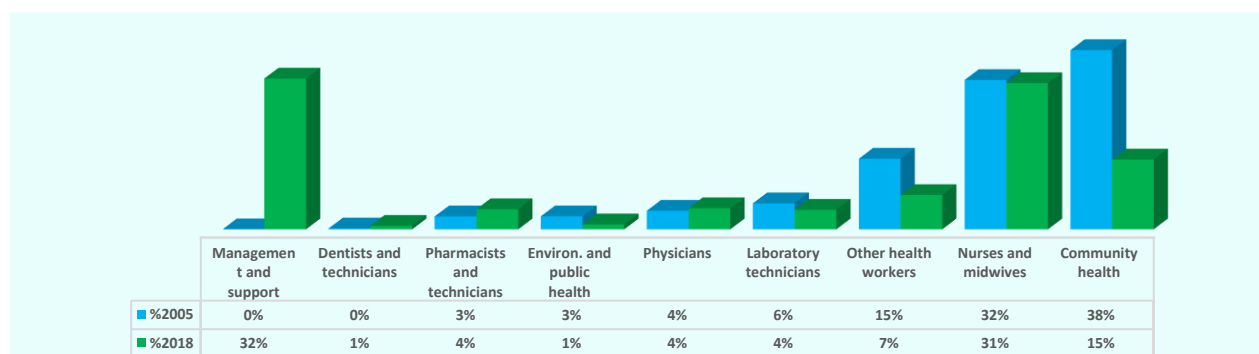
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	24.1
Crude death rates per 1000 mid-year total population	7.0
Under-five mortality rate	43.6
Maternal mortality ratio per 100 000 live births	129.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	3.08
Density of physicians per 1000 population	0.38
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	64.17
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	8.1
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	No
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

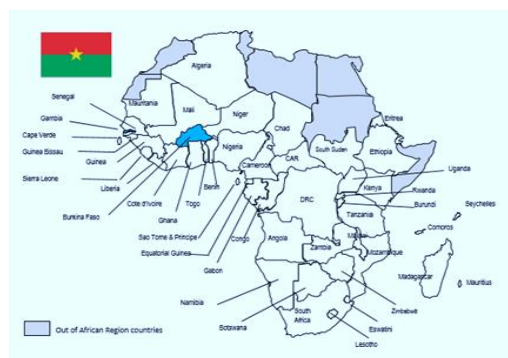
Health Workers in 2005 and 2018



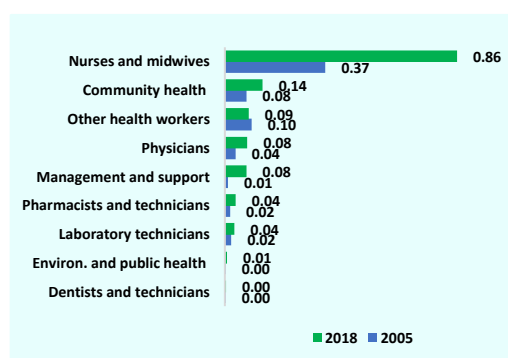
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	715	10	853	8	19	1
Nurses and midwives	4 753	67	6 935	64	46	4
Dentists and technicians	38	1	94	1	147	11
Pharmacists and technicians	333	5	487	5	46	4
Environmental and public health workers	172	2	99	1	-42	-3
Laboratory technicians	277	4	460	4	66	5
Community health workers	-	-	-	-	-	-
Management and support workers	829	12	20	0	-98	-8
Other health workers	-	-	1 859	17	-	-
Total	7 117	100	10 807	100	52	4

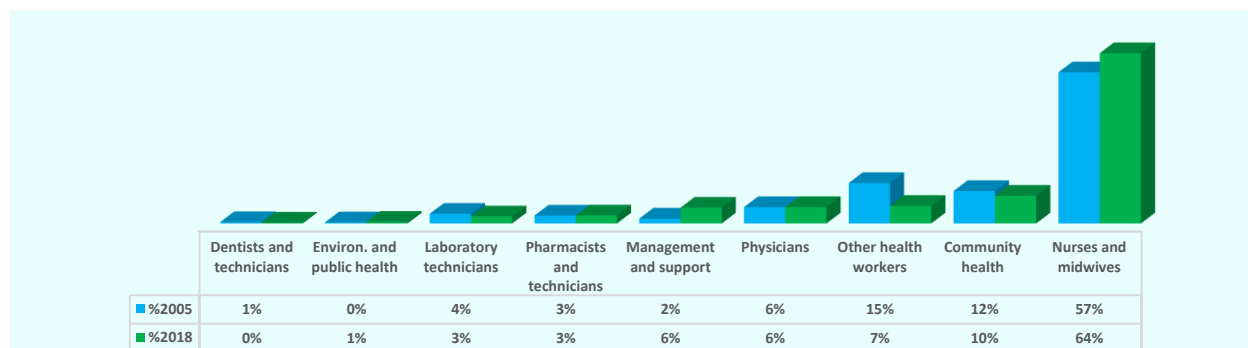
## Burkina Faso



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



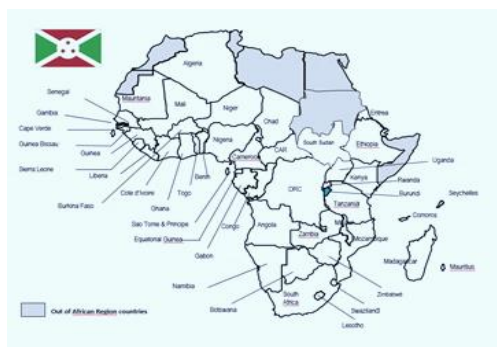
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	708	6	1 626	6	130	10
Nurses and midwives	6 557	57	16 894	64	158	12
Dentists and technicians	58	1	80	0	38	3
Pharmacists and technicians	343	3	792	3	131	10
Environmental and public health workers	46	0	160	1	248	19
Laboratory technicians	418	4	699	3	67	5
Community health workers	1 406	12	2 749	10	96	7
Management and support workers	210	2	653	2	211	16
Other health workers	1 755	15	2 652	10	51	4
Total	11 501	100	26 305	100	129	10

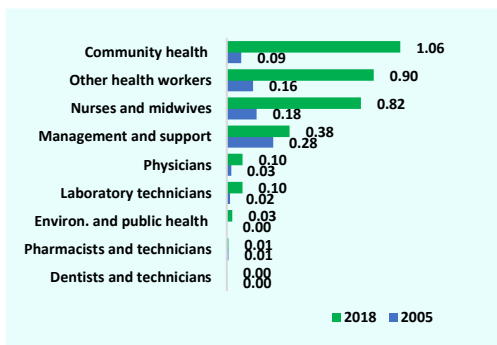
Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	39.4
Crude death rates per 1000 mid-year total population	8.8
Under-five mortality rate	88.6
Maternal mortality ratio per 100 000 live births	371.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.86
Density of physicians per 1000 population	0.08
Density of CHWs per 10 000 population	1.39
% of health managers out of total health workforce	2.48
% nurses/midwives out of total health workforce	64.22
Community health worker to nurse/midwife ratio	0.16
Nurse/midwife to physician ratio	10.39
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

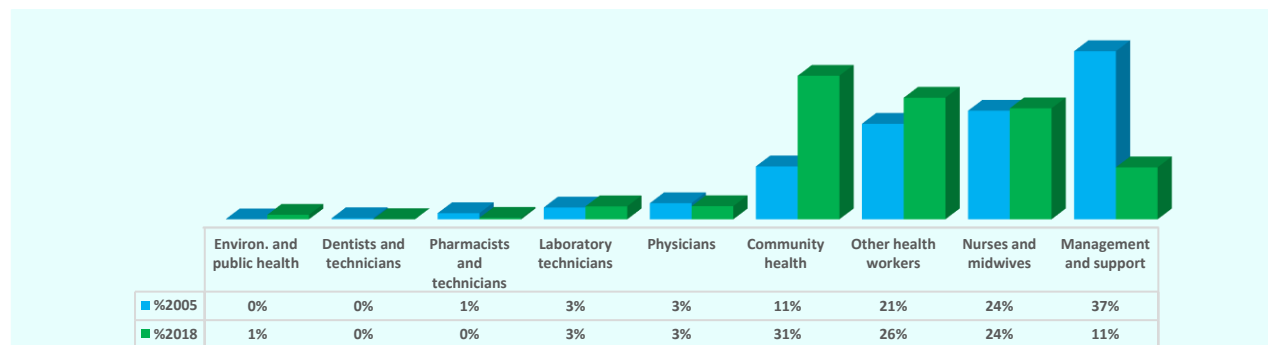
Burundi



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	200	3.50	1 084	2.85	442	34
Nurses and midwives	1 348	23.59	9 156	24.11	579	45
Dentists and technicians	14	0.24	14	0.04	0	0
Pharmacists and technicians	76	1.33	119	0.31	57	4
Environmental and public health workers	0	0	372	0.98	-	-
Laboratory technicians	147	2.57	1 071	2.82	629	48
Community health workers	657	11.50	11 845	31.19	1 703	131
Management and support workers	2 087	36.52	1 383	3.64	-34	-3
Other health workers	1 186	20.75	12 938	34.06	991	76
Total	5 715	100	37 982	100	565	43

Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	42.7
Crude death rates per 1000 mid-year total population	11.0
Under-five mortality rate	81.7
Maternal mortality ratio per 100 000 live births	712.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.82
Density of physicians per 1000 population	0.10
Density of CHWs per 10 000 population	10.60
% of health managers out of total health workforce	3.64
% nurses/midwives out of total health workforce	24.11
Community health worker to nurse/midwife ratio	1.29
Nurse/midwife to physician ratio	8.45
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

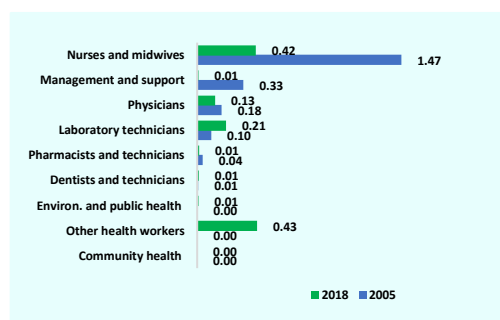
\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region



### Cameroon



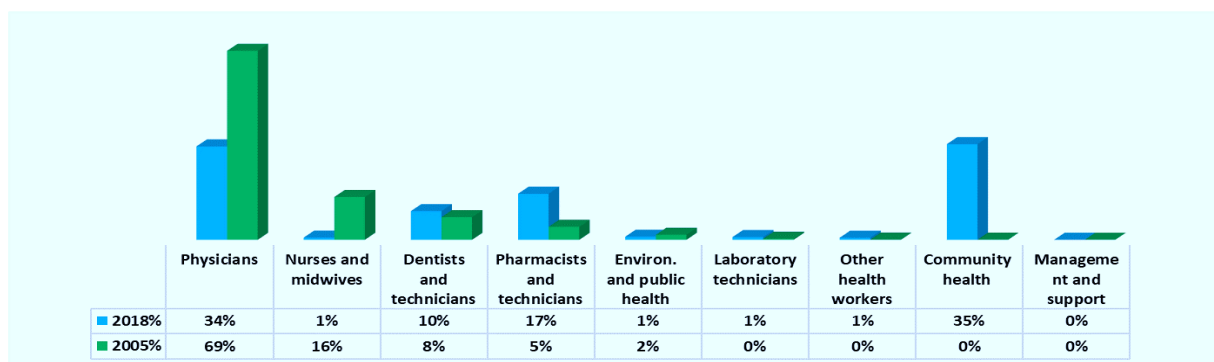
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	36.8
Crude death rates per 1000 mid-year total population	10.3
Under-five mortality rate	87.9
Maternal mortality ratio per 100 000 live births	596.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.42
Density of physicians per 1000 population	0.13
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	0.80
% nurses/midwives out of total health workforce	34.09
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	3.26
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	Yes
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

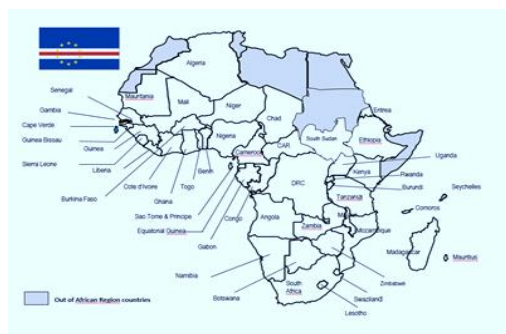
Health Workers in 2005 and 2018



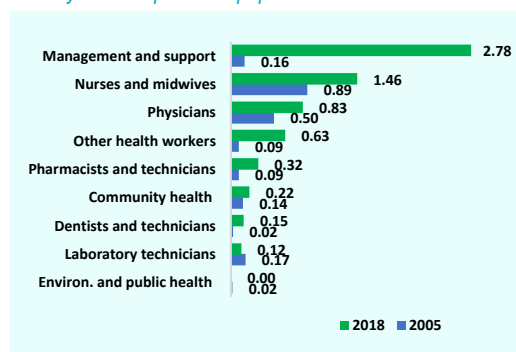
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	3 124	8.28	3 259	10.47	4	0
Nurses and midwives	26 042	68.98	10 615	34.09	-59	-5
Dentists and technicians	147	0.39	308	0.99	110	8
Pharmacists and technicians	700	1.85	350	1.12	-50	-4
Environmental and public health workers	28	7.42	238	0.76	750	58
Laboratory technicians	1 793	4.75	5 235	16.81	192	15
Community health workers	0	0.00	0	0	-	-
Management and support workers	5 902	15.63	250	0.80	-96	-7
Other health workers	16	0.04	10 879	34.94	67 894	5 223
Total	37 752	100	31 134	100	-18	-1

### Cabo Verde



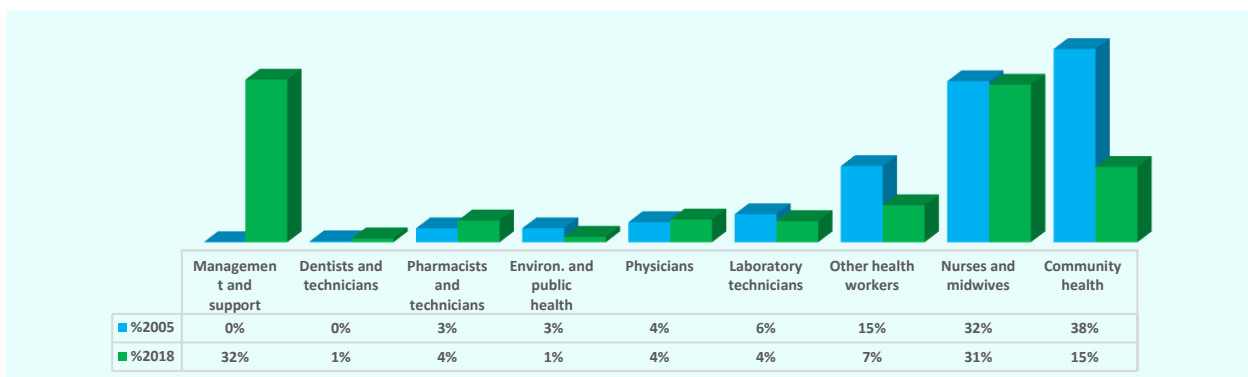
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	21.1
Crude death rates per 1000 mid-year total population	5.6
Under-five mortality rate	24.5
Maternal mortality ratio per 100 000 live births	42.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.46
Density of physicians per 1000 population	0.83
Density of CHWs per 10 000 population	2.15
% of health managers out of total health workforce	1.72
% nurses/midwives out of total health workforce	22.48
Community health worker to nurse/midwife ratio	0.15
Nurse/midwife to physician ratio	1.76
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	Yes
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

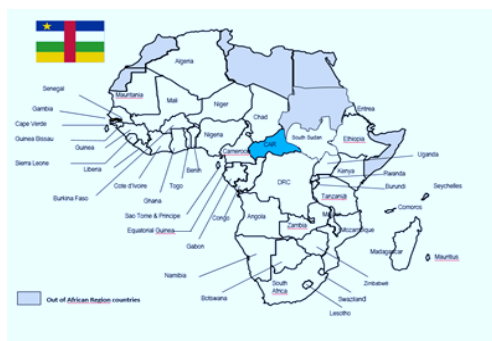
Health Workers in 2005 and 2018



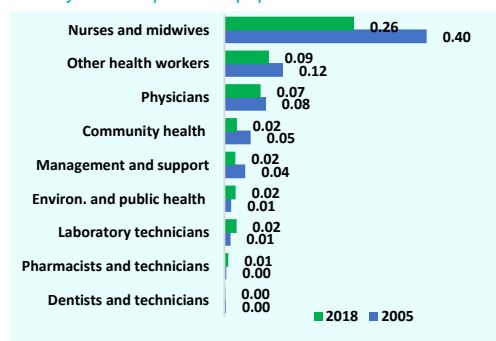
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	231	23.99	452	12.78	96	7
Nurses and midwives	410	42.58	795	22.48	94	7
Dentists and technicians	11	1.14	81	2.29	636	49
Pharmacists and technicians	43	4.47	172	4.86	300	23
Environmental and public health workers	9	0.93	1	2.83	-89	-7
Laboratory technicians	78	8.10	65	1.84	-17	-1
Community health workers	65	6.75	117	3.31	80	6
Management and support workers	74	7.68	61	1.72	-18	-1
Other health workers	42	4.36	1 793	50.69	4 169	321
Total	963	100	3 537	100	267	21

### Central African Republic



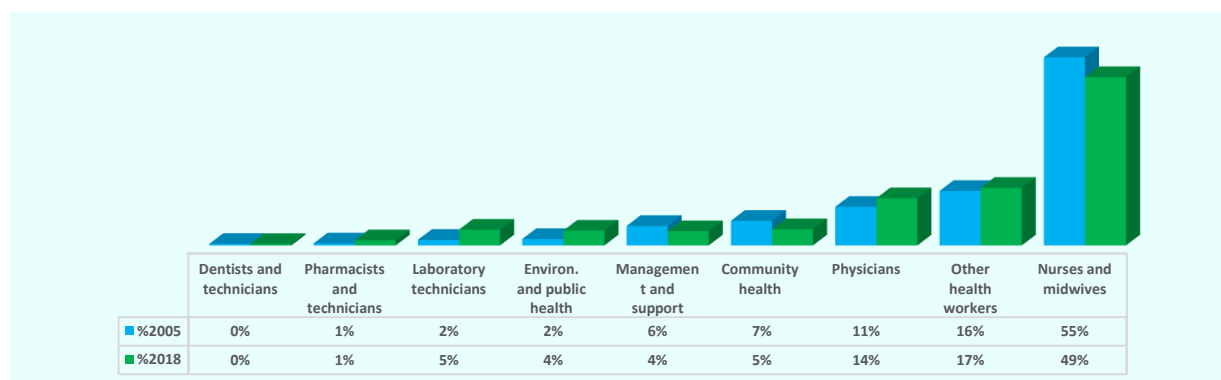
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	36.1
Crude death rates per 1000 mid-year total population	14.0
Under-five mortality rate	130.1
Maternal mortality ratio per 100 000 live births	882.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.26
Density of physicians per 1000 population	0.07
Density of CHWs per 10 000 population	0.25
% of health managers out of total health workforce	0.91
% nurses/midwives out of total health workforce	49.42
Community health worker to nurse/midwife ratio	0.10
Nurse/midwife to physician ratio	3.57
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018



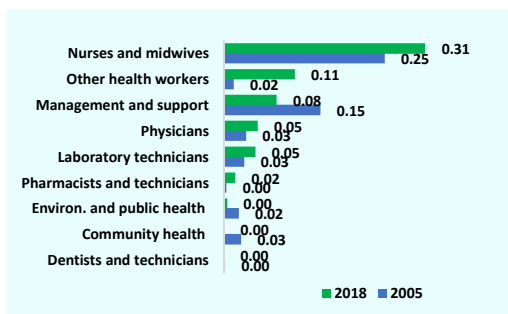
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	331	11	335	14	1	0
Nurses and midwives	1 613	55	1 195	49	-26	-2
Dentists and technicians	13	0	10	0	-23	-2
Pharmacists and technicians	17	1	36	1	112	9
Environmental and public health workers	55	2	105	4	91	7
Laboratory technicians	48	2	112	5	133	10
Community health workers	211	7	115	5	-45	-3
Management and support workers	167	6	22	2	-87	-7
Other health workers	467	16	488	20	4	0
Total	2 922	100	2 418	100	-17	-1

### Chad



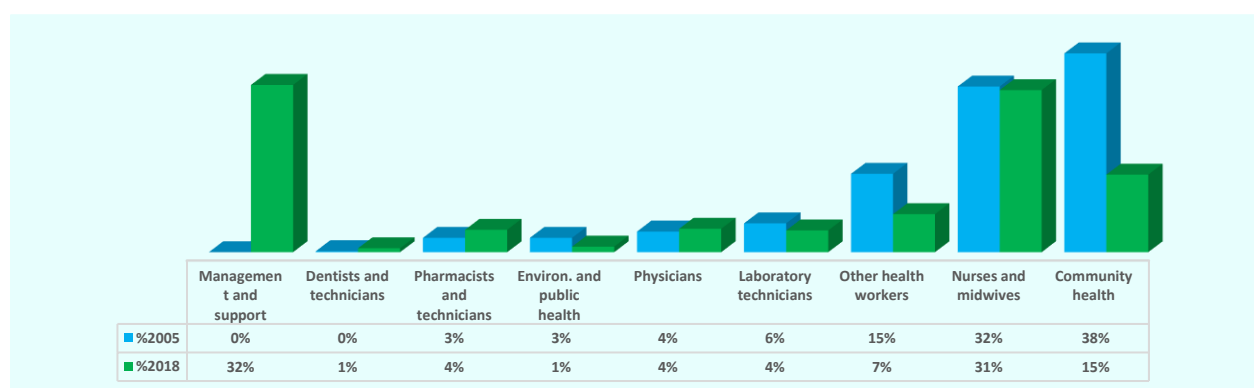
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	43.9
Crude death rates per 1000 mid-year total population	13.2
Under-five mortality rate	138.7
Maternal mortality ratio per 100 000 live births	856.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.31
Density of physicians per 1000 population	0.05
Density of CHWs per 10 000 population	0.0
% of health managers out of total health workforce	7.58
% nurses/midwives out of total health workforce	49.70
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	5.98
Existence of investment case study for HRH	Yes
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

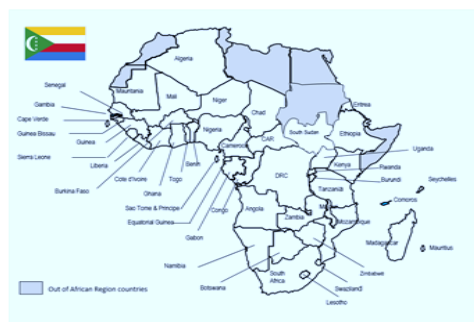
Health Workers in 2005 and 2018



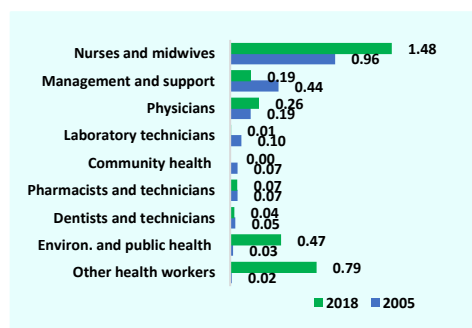
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	345	6	803	8	133	10
Nurses and midwives	2 499	47	4 799	50	92	7
Dentists and technicians	15	0	3	0	-80	-6
Pharmacists and technicians	37	1	269	3	627	48
Environmental and public health workers	230	4	76	1	-67	-5
Laboratory technicians	317	6	749	8	136	10
Community health workers	268	5	7	0	-97	-7
Management and support workers	1 502	28	732	8	-51	-4
Other health workers	153	3	2 217	23	1 349	104
Total	5 366	100	9 655	100	80	6

### Comoros



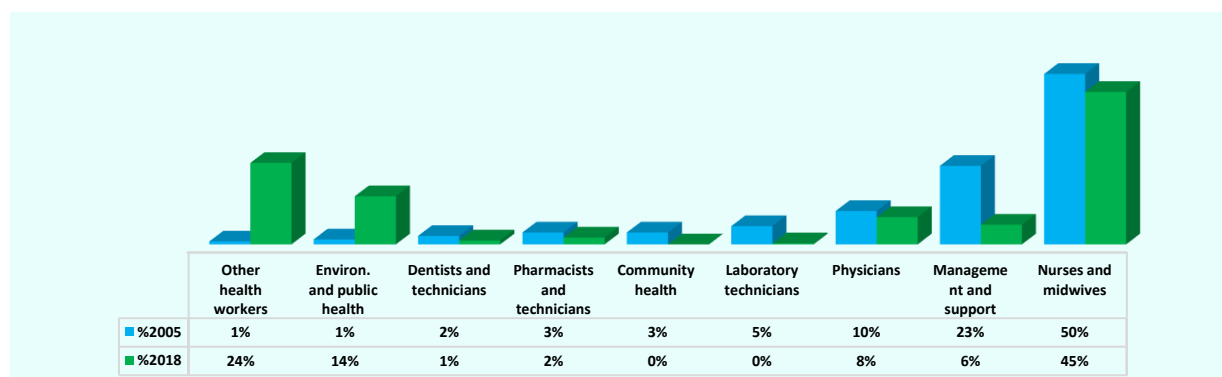
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	33.3
Crude death rates per 1000 mid-year total population	7.5
Under-five mortality rate	73.5
Maternal mortality ratio per 100 000 live births	335.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.41
Density of physicians per 1000 population	0.27
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	1479
% nurses/midwives out of total health workforce	41.89
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	5.2
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	No
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

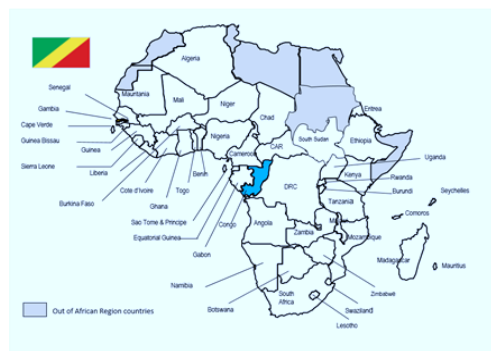
Health Workers in 2005 and 2018



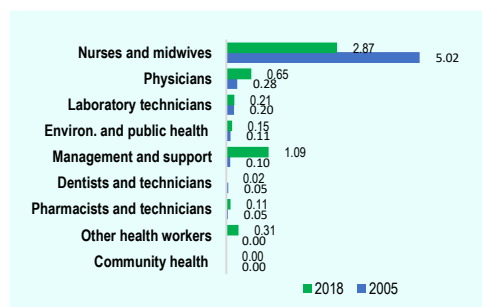
Health Workers in 2005 and 2018

Categories	2005		2018		% growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	115	10	224	8	95	7
Nurses and midwives	588	50	1 170	42	99	8
Dentists and technicians	29	2	40	1	38	3
Pharmacists and technicians	41	3	106	4	159	12
Environmental and public health workers	17	1	115	4	576	44
Laboratory technicians	63	5	197	7	213	16
Community health workers	41	3	0	0	-100	-8
Management and support workers	271	23	619	22	128	10
Other health workers	10	1	322	12	3 120	240
Total	1 175	100	2 793	100	138	11

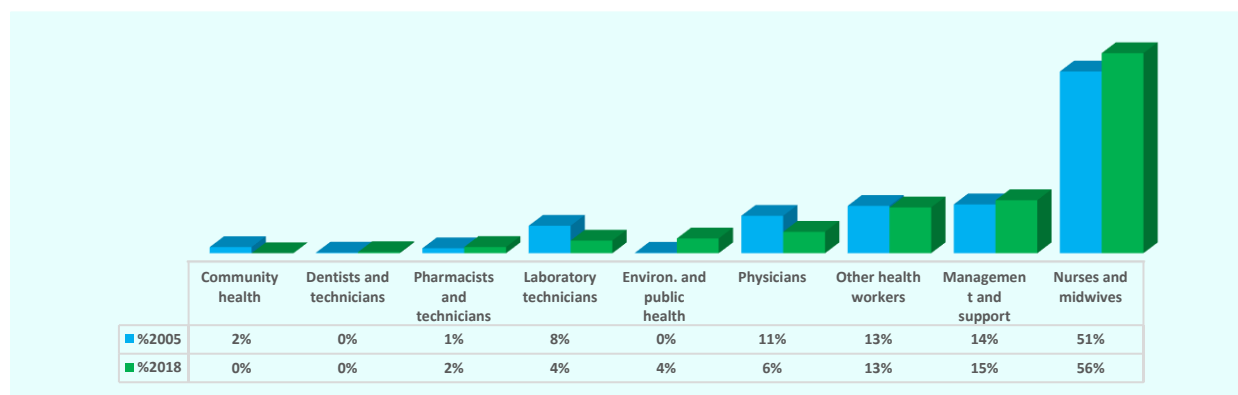
### Congo



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



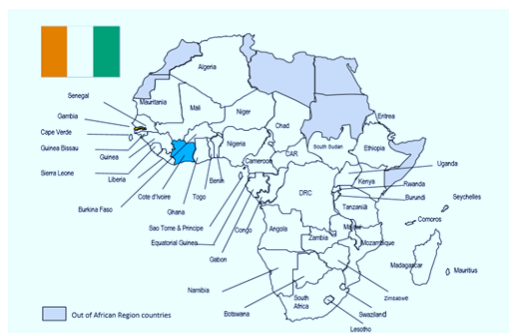
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	756	11	544	6	-28	-2
Nurses and midwives	3 672	51	5 081	56	38	3
Dentists and technicians	12	0	27	0	125	10
Pharmacists and technicians	99	1	157	2	59	5
Environmental and public health workers	9	0	374	4	4 056	312
Laboratory technicians	554	8	320	4	-42	-3
Community health workers	124	2	0	0	-100	-8
Management and support workers	987	14	790	9	-20	-2
Other health workers	957	13	1 719	19	80	6
Total	7 170	100	9 012	100	26	2

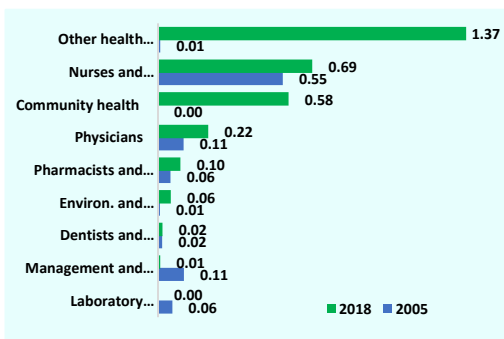
Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	35.2
Crude death rates per 1000 mid-year total population	7.6
Under-five mortality rate	45.0
Maternal mortality ratio per 100 000 live births	442.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.97
Density of physicians per 1000 population	0.10
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	8.77
% nurses/midwives out of total health workforce	56.38
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	9.34
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

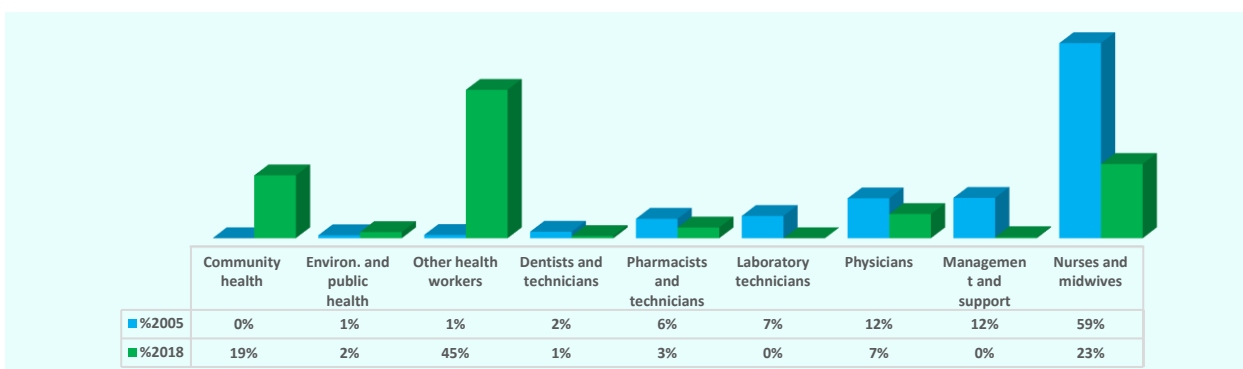
Côte d'Ivoire



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



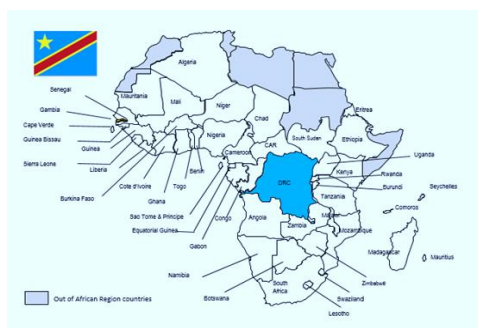
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	2 081	12	5 602	7	169	13
Nurses and midwives	10 180	59	17 190	23	69	5
Dentists and technicians	339	2	506	1	49	4
Pharmacists and technicians	1 015	6	2 495	3	146	11
Environmental and public health workers	155	1	1 425	2	819	63
Laboratory technicians	1 165	7	0	0	-100	-8
Community health workers	0	0	14 556	19	-	-
Management and support workers	2 107	12	91	0	-96	-7
Other health workers	172	1	34 511	45	19 965	1 536
<b>Total</b>	<b>17 214</b>	<b>100</b>	<b>76 376</b>	<b>100</b>	<b>344</b>	<b>26</b>

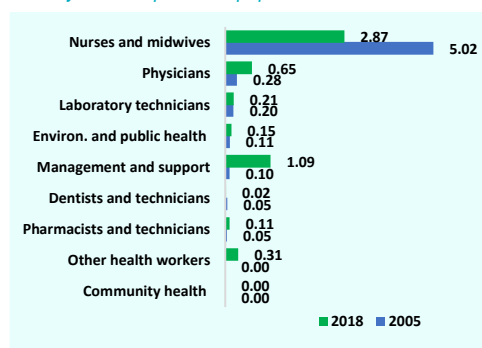
Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	37.1
Crude death rates per 1000 mid-year total population	12.5
Under-five mortality rate	92.6
Maternal mortality ratio per 100 000 live births	645.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.69
Density of physicians per 1000 population	0.22
Density of CHWs per 10 000 population	5.81
% of health managers out of total health workforce	0.12
% nurses/midwives out of total health workforce	22.51
Community health worker to nurse/midwife ratio	0.85
Nurse/midwife to physician ratio	3.07
Existence of investment case study for HRH	Yes
Existence of national HRH policy	No
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

### Democratic Republic of the Congo



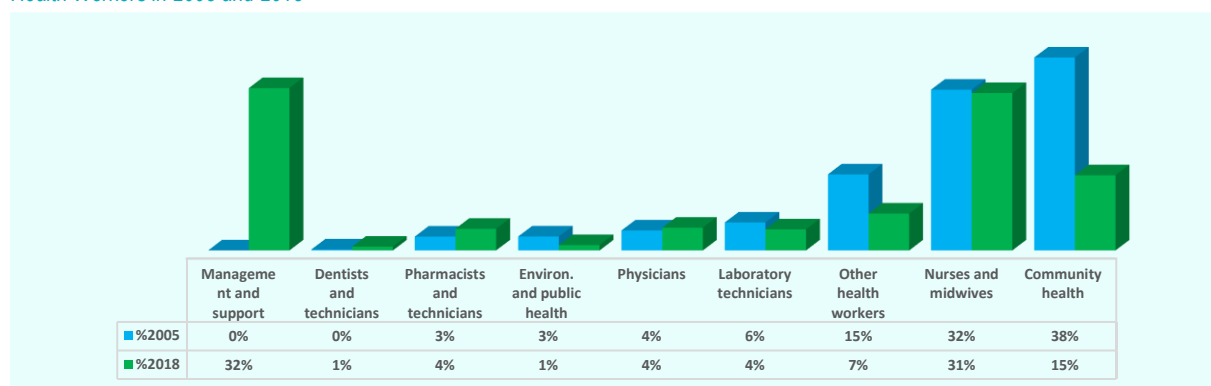
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	42.8
Crude death rates per 1000 mid-year total population	10.2
Under-five mortality rate	98.3
Maternal mortality ratio per 100 000 live births	693.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.28
Density of physicians per 1000 population	0.38
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	1.18
% nurses/midwives out of total health workforce	47.96
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	3.41
Existence of investment case study for HRH	Yes
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	Yes
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018

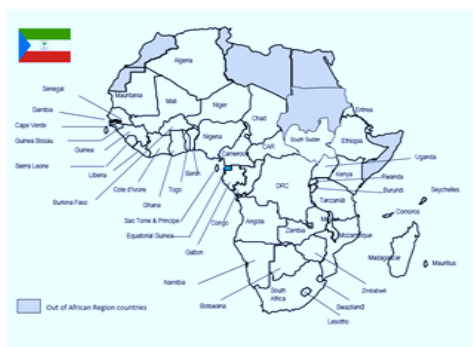


Health Workers in 2005 and 2018

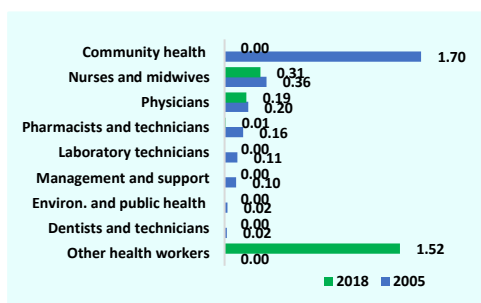
Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	5 827	11	31 546	14	441	34
Nurses and midwives	28 789	55	10 7427	48	273	21
Dentists and technicians	159	0	404	0	154	12
Pharmacists and technicians	1 200	2	1 687	1	41	3
Environmental and public health workers	0	0	167	0	-	-
Laboratory technicians	512	1	2 934	1	473	36
Community health workers	0	0	0	0	-	-
Management and support workers	15 013	29	2 651	1	-82	-6
Other health workers	1 042	2	77 186	34	7 307	562
Total	52 542	100	224 002	100	326	25



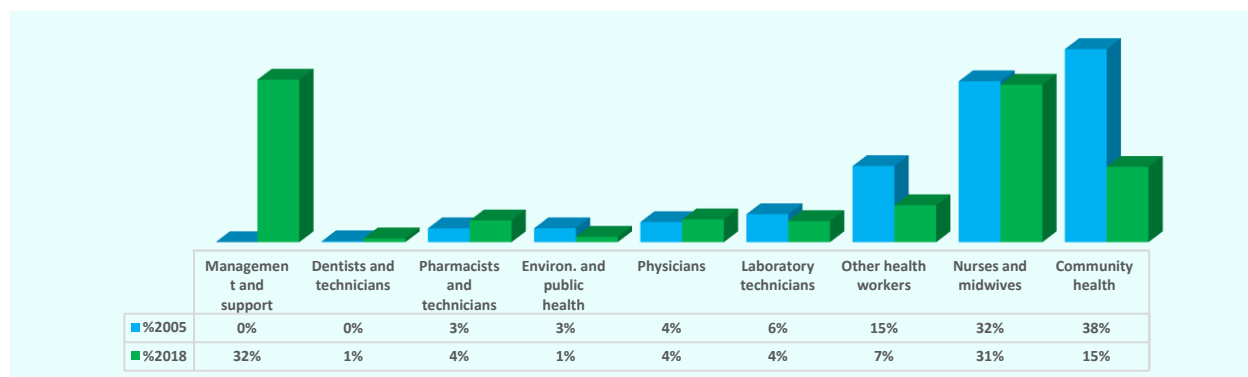
### Equatorial Guinea



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



Health Workers in 2005 and 2018

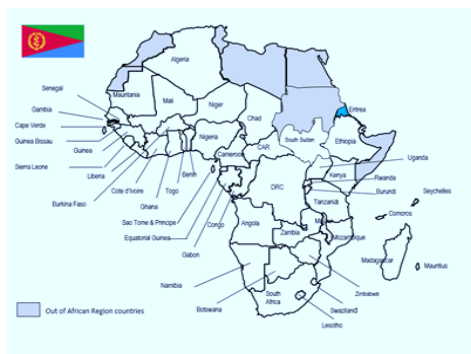
Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	153	8	507	44	231	18
Nurses and midwives	271	13	634	56	134	10
Dentists and technicians	15	1	-	-	-100	-8
Pharmacists and technicians	121	6	-	-	-100	-8
Environmental and public health workers	18	1	-	-	-100	-8
Laboratory technicians	84	4	-	-	-100	-8
Community health workers	1 275	63	-	-	-100	-8
Management and support workers	74	4	-	-	-100	-8
Other health workers	-	-	-	-	-	-
Total	2 011	100	1 141	100	-43.3	-3

NB : Data of HRH survey 2018 not available in 2018

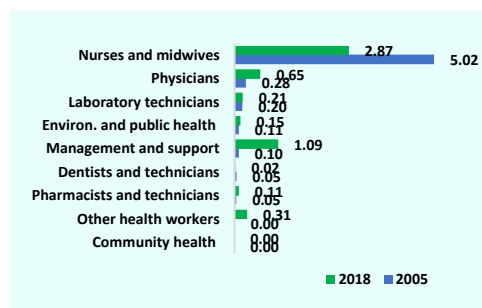
Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	34.6
Crude death rates per 1000 mid-year total population	10.3
Under-five mortality rate	94.1
Maternal mortality ratio per 100 000 live births	342.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.50
Density of physicians per 1000 population	0.40
Density of CHWs per 10 000 population	-
% of health managers out of total health workforce	-
% nurses/midwives out of total health workforce	55.57
Community health worker to nurse/midwife ratio	-
Nurse/midwife to physician ratio	1.3
Existence of investment case study for HRH	-
Existence of national HRH policy	-
Existence of national HRH strategic plan	-
Existence of an HRH department/directorate in the MoH	-
Existence of a functional national health workforce observatory	-
Existence of HRH country profile	-
Establishment of national health workforce accounts	-
Existence of a focal point for the national health workforce accounts	-
Existence of HRIS with regularly updated database	-
Existence of an accreditation body for health sciences schools	-
Existence of a commitment to increase allocation	-

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

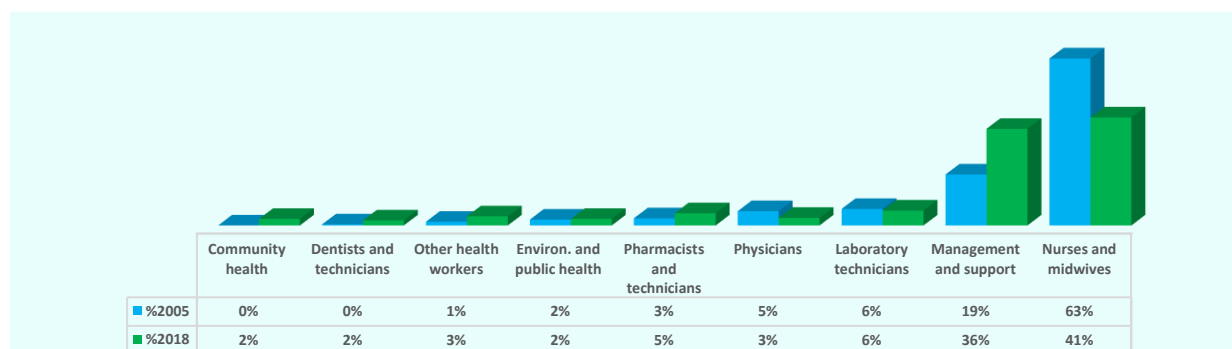
Eritrea



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



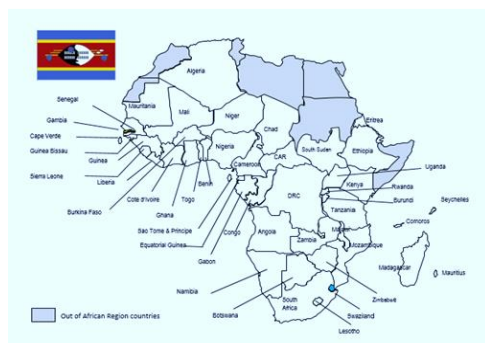
Health Workers in 2005 and 2018

Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	32.8
Crude death rates per 1000 mid-year total population	7.1
Under-five mortality rate	46.5
Maternal mortality ratio per 100 000 live births	501.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.15
Density of physicians per 1000 population	0.08
Density of CHWs per 10 000 population	0.70
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	40.51
Community health worker to nurse/midwife ratio	0.06
Nurse/midwife to physician ratio	14.2
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

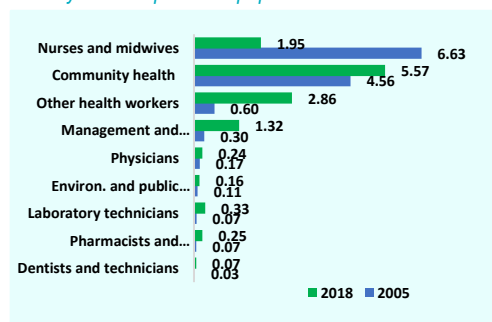
\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Categories	2005		2018		% growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	215	5	280	3	30	2
Nurses and midwives	2 505	63	3 984	41	59	5
Dentists and technicians	16	0	186	2	1 063	82
Pharmacists and technicians	107	3	451	5	321	25
Environmental and public health workers	88	2	243	2	176	14
Laboratory technicians	248	6	549	6	121	9
Community health workers	0	0	243	2	-	-
Management and support workers	765	19	3 563	36	366	28
Other health workers	56	1	336	3	500	38
Total	4 000	100	9 835	100	146	11

### Eswatini



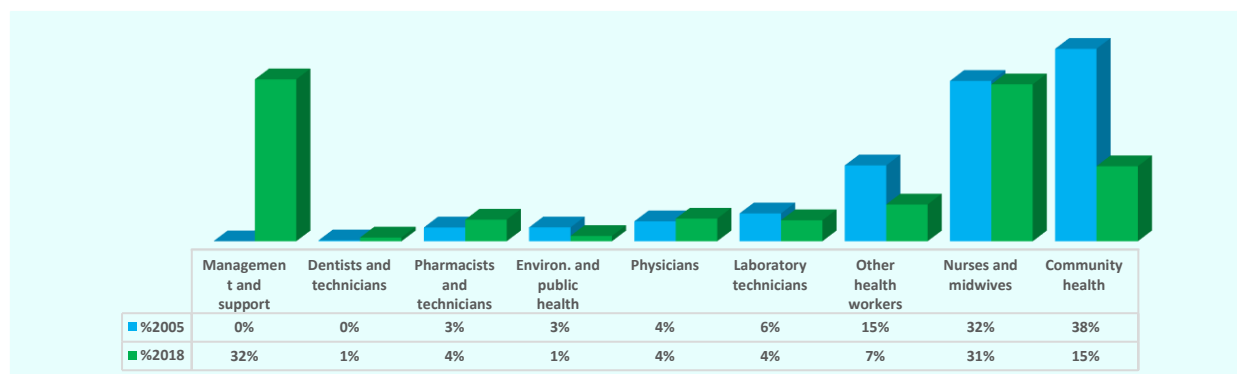
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	29.3
Crude death rates per 1000 mid-year total population	9.9
Under-five mortality rate	60.7
Maternal mortality ratio per 100 000 live births	389.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.95
Density of physicians per 1000 population	0.24
Density of CHWs per 10 000 population	55.66
% of health managers out of total health workforce	1.35
% nurses/midwives out of total health workforce	15.32
Community health worker to nurse/midwife ratio	2.85
Nurse/midwife to physician ratio	7.98
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

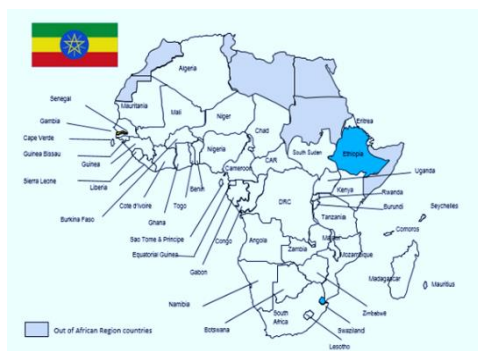
Health Workers in 2005 and 2018



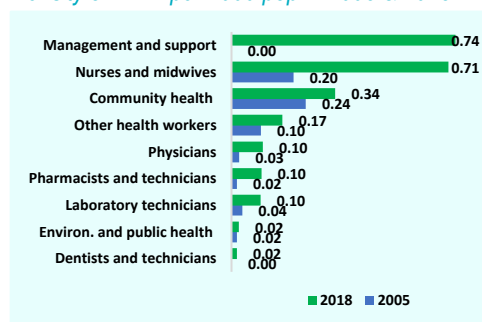
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	171	1	278	2	63	5
Nurses and midwives	6 828	53	2 218	15	-68	-5
Dentists and technicians	32	0	74	1	131	10
Pharmacists and technicians	70	1	281	2	301	23
Environmental and public health workers	110	1	187	1	70	5
Laboratory technicians	77	1	370	3	381	29
Community health workers	4 700	36	6 324	44	35	3
Management and support workers	310	2	195	1	-37	-3
Other health workers	616	5	4 547	31	638	49
Total	12 914	100	14 474	100	12	1

## Ethiopia



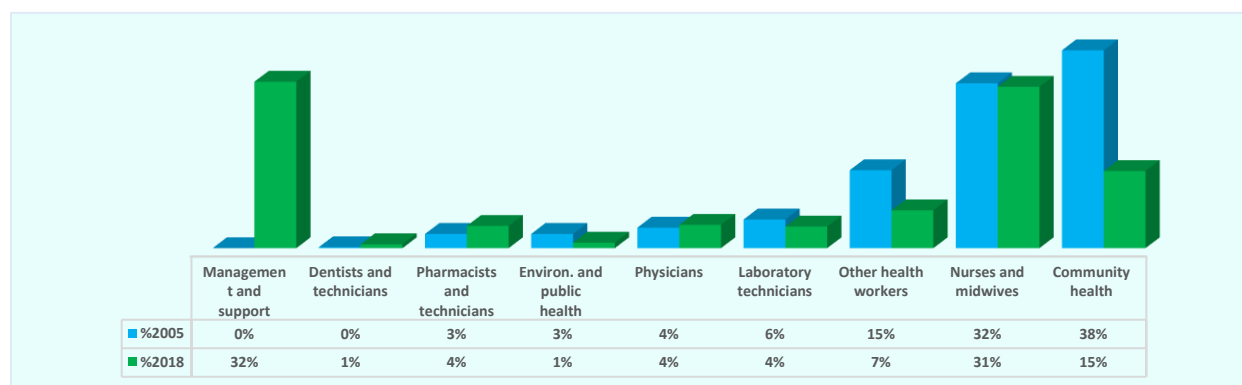
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	32.3
Crude death rates per 1000 mid-year total population	7.0
Under-five mortality rate	59.2
Maternal mortality ratio per 100 000 live births	353.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.71
Density of physicians per 1000 population	0.10
Density of CHWs per 10 000 population	3.41
% of health managers out of total health workforce	1.74
% nurses/midwives out of total health workforce	31.06
Community health worker to nurse/midwife ratio	0.48
Nurse/midwife to physician ratio	6.92
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018



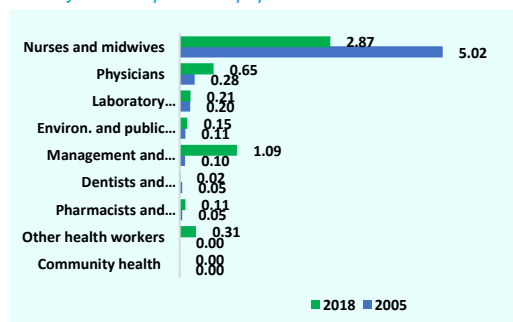
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	1 936	4	11 263	4	482	37
Nurses and midwives	15 544	32	77 933	31	401	31
Dentists and technicians	93	0	1 889	1	1 931	149
Pharmacists and technicians	1 343	3	10 752	4	701	54
Environmental and public health workers	1 347	3	2 662	1	98	8
Laboratory technicians	2 703	6	10 450	4	287	22
Community health workers	18 652	38	37 259	15	100	8
Management and support workers	0	0	4 365	2	-	-
Other health workers	7 354	15	94 320	38	1 183	91
Total	48 972	100	250 893	100	412	32

### Gabon



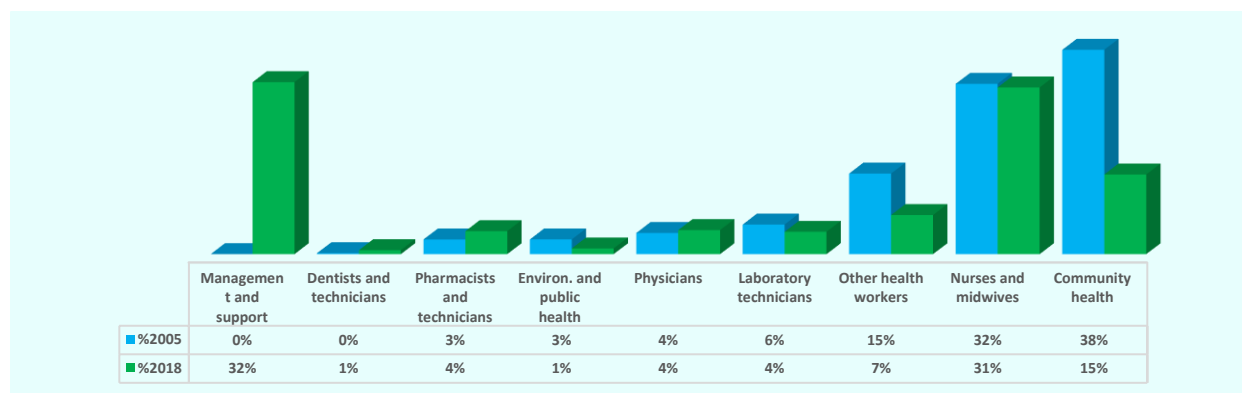
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	30.1
Crude death rates per 1000 mid-year total population	7.8
Under-five mortality rate	50.8
Maternal mortality ratio per 100 000 live births	291.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	2.63
Density of physicians per 1000 population	0.48
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	2.77
% nurses/midwives out of total health workforce	54.95
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	5.49
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	Yes
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

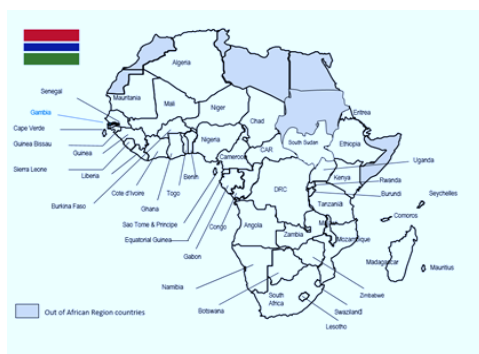
Health Workers in 2005 and 2018



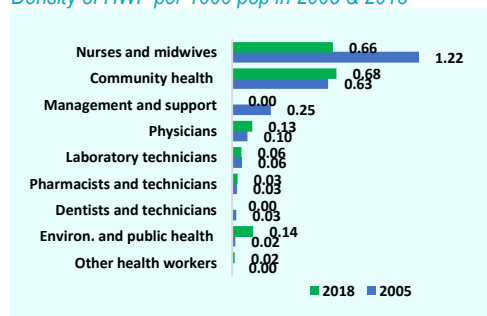
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	395	5	1 014	10	157	12
Nurses and midwives	6 974	86	5 566	55	-20	-2
Dentists and technicians	66	1	32	0	-52	-4
Pharmacists and technicians	63	1	172	2	173	13
Environmental and public health workers	150	2	290	3	93	7
Laboratory technicians	276	3	19	0	-93	-7
Community health workers	0	0	0	0	-	-
Management and support workers	144	2	281	3	95	7
Other health workers	1	0	2 755	27	275 400	21 185
Total	8 069	100	10 129	100	26	2

Gambia



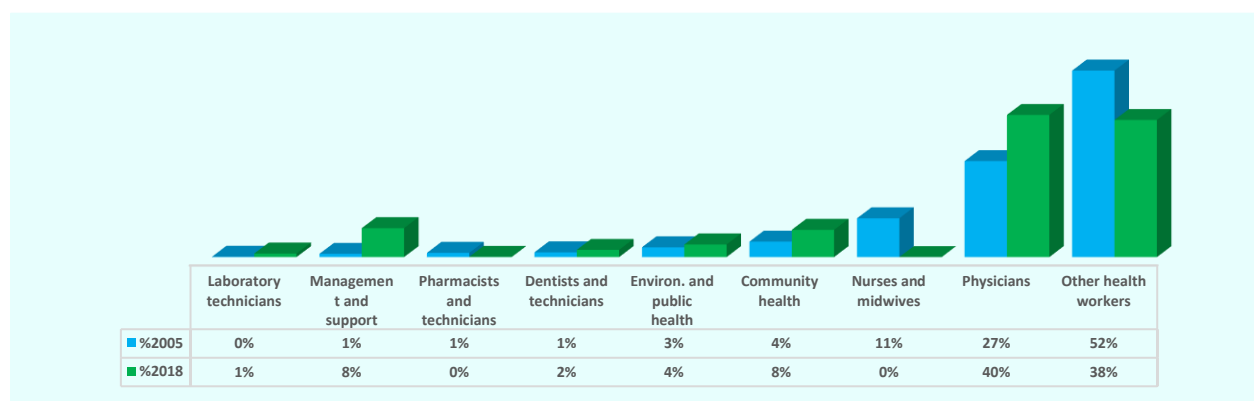
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	40.0
Crude death rates per 1000 mid-year total population	8.2
Under-five mortality rate	68.9
Maternal mortality ratio per 100 000 live births	706.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.66
Density of physicians per 1000 population	0.13
Density of CHWs per 10 000 population	6.81
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	38.18
Community health worker to nurse/midwife ratio	1.04
Nurse/midwife to physician ratio	5.03
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

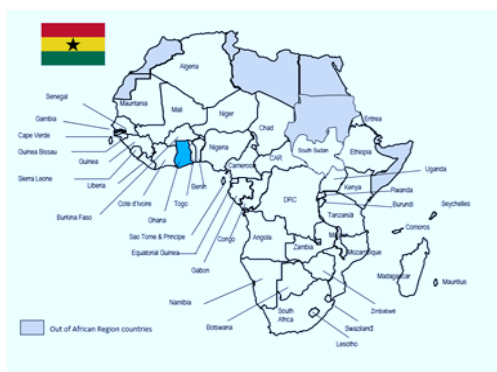
Health Workers in 2005 and 2018



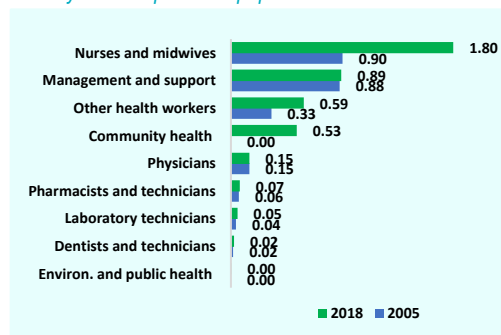
Health Workers in 2005 and 2018

Categories	2005		2018		% growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	156	4	298	8	91	7
Nurses and midwives	1 881	52	1 498	38	-20	-2
Dentists and technicians	43	1	3	0	-93	-7
Pharmacists and technicians	48	1	79	2.	65	5
Environmental and public health workers	33	1	316	8	858	66
Laboratory technicians	99	3	138	4	39	3
Community health workers	968	27	1 553	40	60	5
Management and support workers	391	11	0	0	-100	-8
Other health workers	3	0	39	1	1 200	92
Total	3 622	100	3 924	100	8	1

### Ghana



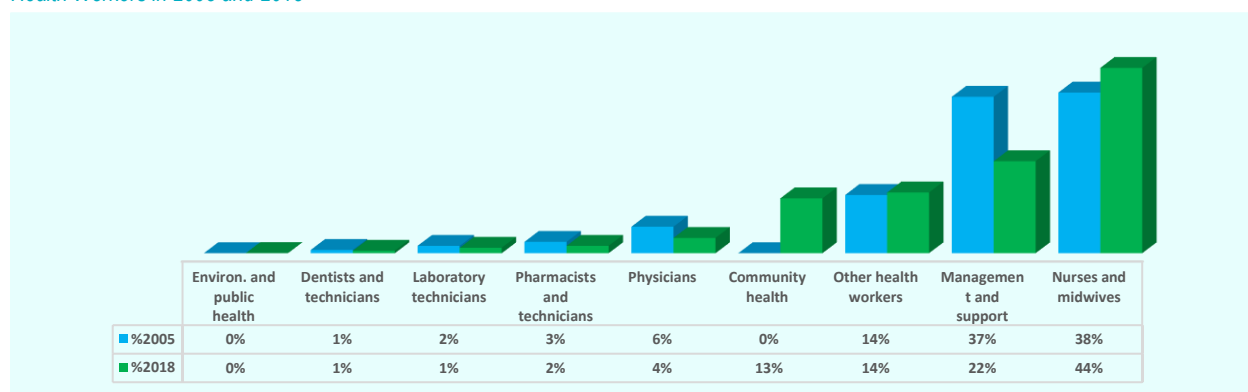
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	31.6
Crude death rates per 1000 mid-year total population	8.3
Under-five mortality rate	61.6
Maternal mortality ratio per 100 000 live births	319.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.80
Density of physicians per 1000 population	0.15
Density of CHWs per 10 000 population	5.31
% of health managers out of total health workforce	0.85
% nurses/midwives out of total health workforce	43.75
Community health worker to nurse/midwife ratio	0.30
Nurse/midwife to physician ratio	12.13
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	Yes
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	Yes
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018



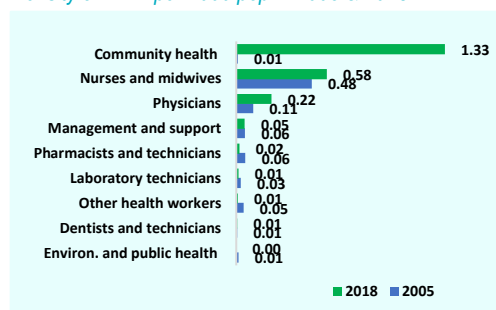
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	3 240	6	4 406	4	36	3
Nurses and midwives	19 667	38	53 452	44	172	13
Dentists and technicians	393	1	713	1	81	6
Pharmacists and technicians	1 388	3	2 127	2	53	4
Environmental and public health workers	0	0	47	0	-	-
Laboratory technicians	899	2	1 563	1	74	6
Community health workers	0	0	15 820	13	-	-
Management and support workers	19 151	37	1 033	1	-95	-7
Other health workers	7 132	14	43 022	35	503	39
Total	51 870	100	122 183	100	136	10

### Guinea



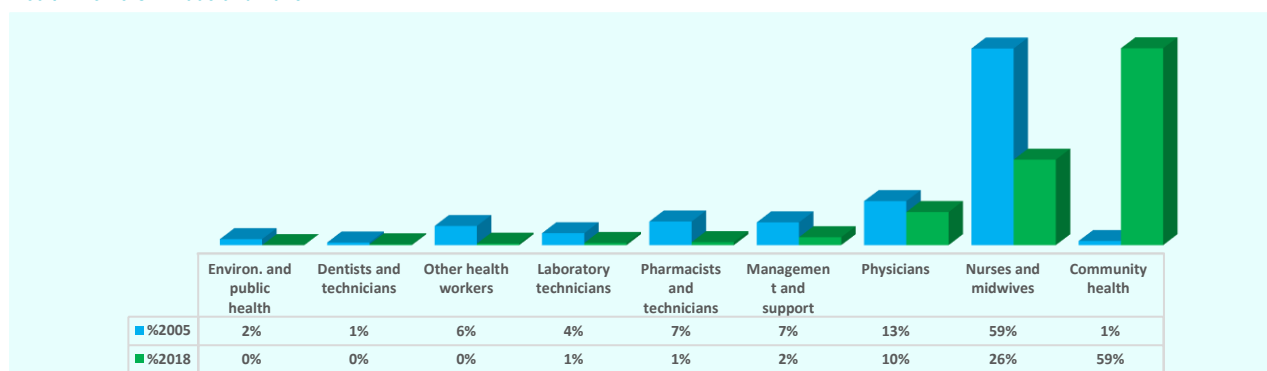
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	36.4
Crude death rates per 1000 mid-year total population	9.6
Under-five mortality rate	93.7
Maternal mortality ratio per 100 000 live births	679.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.58
Density of physicians per 1000 population	0.22
Density of CHWs per 10 000 population	13.35
% of health managers out of total health workforce	0.68
% nurses/midwives out of total health workforce	25.83
Community health worker to nurse/midwife ratio	2.30
Nurse/midwife to physician ratio	2.58
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018

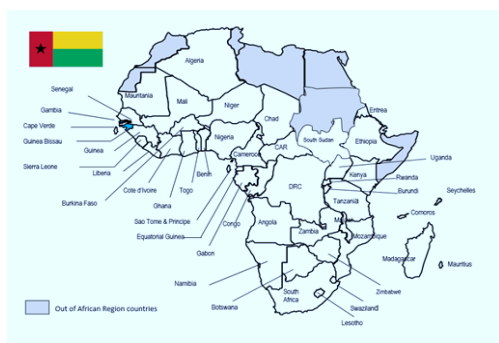


Health Workers in 2005 and 2018

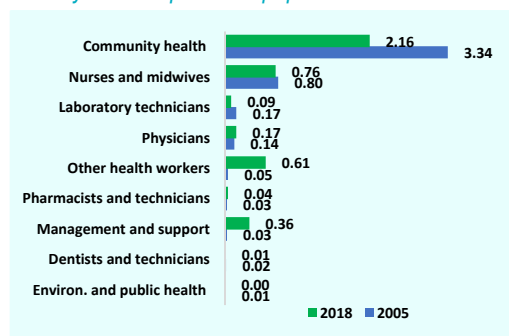
Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	987	13	2 787	10	182	14
Nurses and midwives	4 408	59	7 195	26	63	5
Dentists and technicians	60	1	73	0	22	2
Pharmacists and technicians	530	7	255	1	-52	-4
Environmental and public health workers	135	2	0	0	-100	-8
Laboratory technicians	268	4	181	1	-32	-2
Community health workers	93	1	16 567	59	17 714	1 363
Management and support workers	511	7	189	1	-63	-5
Other health workers	430	6	610	2	42	3
Total	7 422	100	27 857	100	275	21



## Guinea-Bissau



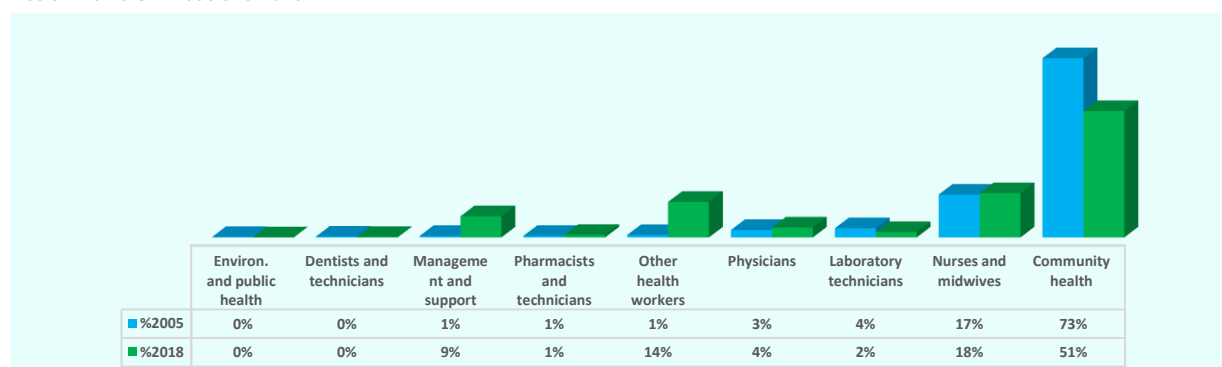
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	37.1
Crude death rates per 1000 mid-year total population	10.8
Under-five mortality rate	92.5
Maternal mortality ratio per 100 000 live births	549.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.76
Density of physicians per 1000 population	0.17
Density of CHWs per 10 000 population	21.65
% of health managers out of total health workforce	1.65
% nurses/midwives out of total health workforce	18.01
Community health worker to nurse/midwife ratio	2.86
Nurse/midwife to physician ratio	4.47
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

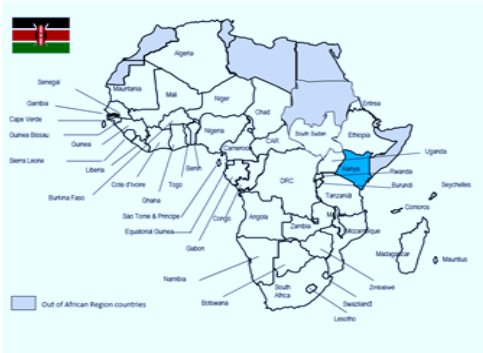
Health Workers in 2005 and 2018



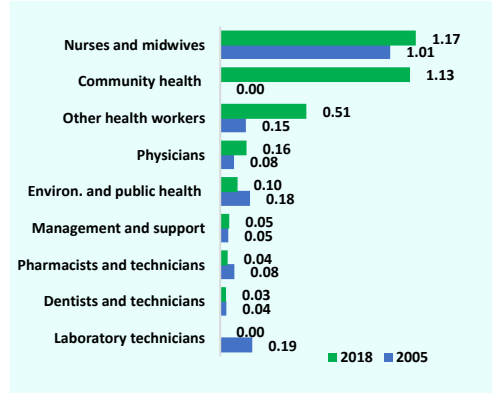
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	188	3	318	4	69	5
Nurses and midwives	1 072	17	1 421	18	33	3
Dentists and technicians	22	0	16	0	-27	-2
Pharmacists and technicians	40	1	82	1	105	8
Environmental and public health workers	13	0	3	0	-77	-6
Laboratory technicians	230	4	172	2	-25	-2
Community health workers	4 486	73	4 057	51	-10	-1
Management and support workers	38	1	130	2	242	19
Other health workers	61	1	1 691	21	2 672	206
Total	6 150	100	7 890	100	28	2

Kenya



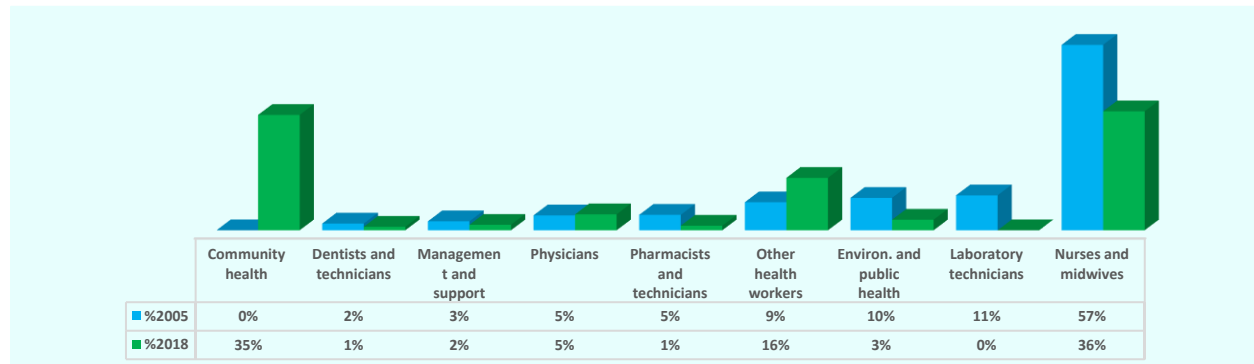
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	31.8
Crude death rates per 1000 mid-year total population	5.8
Under-five mortality rate	49.4
Maternal mortality ratio per 100 000 live births	510.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.17
Density of physicians per 1000 population	0.16
Density of CHWs per 10 000 population	11.30
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	36.40
Community health worker to nurse/midwife ratio	0.97
Nurse/midwife to physician ratio	7.4
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	No
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

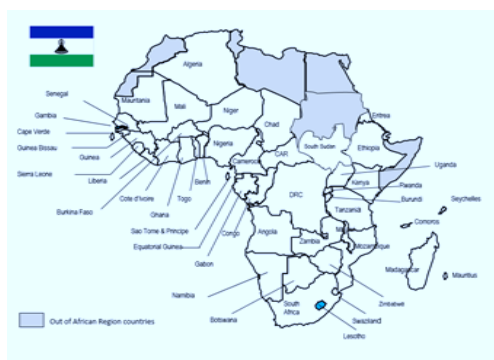
Health Workers in 2005 and 2018



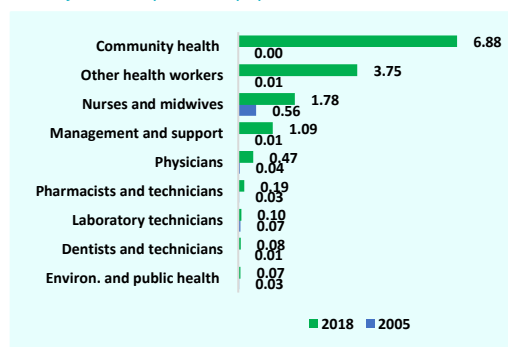
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	2 984	5	8 042	5	170	13
Nurses and midwives	37 113	57	59 901	36	61	5
Dentists and technicians	1 340	2	1 764	1	32	2
Pharmacists and technicians	3 094	5	2 295	1	-26	-2
Environmental and public health workers	6 496	10	5 310	3	-18	-1
Laboratory technicians	7 000	11	0	0	-100	-8
Community health workers	0	0	58 079	35	-	-
Management and support workers	1 797	3	2 759	2	54	4
Other health workers	5 610	9	26 406	16	371	29
Total	65 434	100	164 556	100	151	12

Lesotho



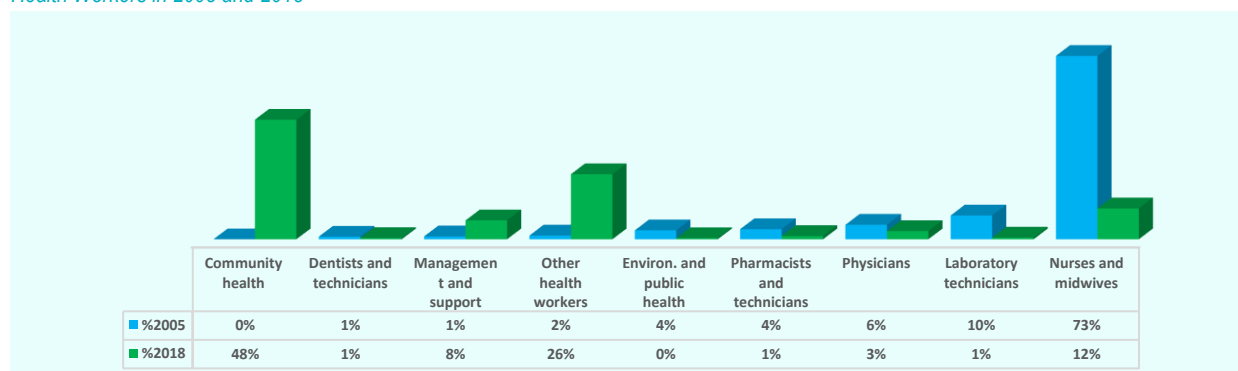
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	28.2
Crude death rates per 1000 mid-year total population	12.9
Under-five mortality rate	90.2
Maternal mortality ratio per 100 000 live births	487.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	4.15
Density of physicians per 1000 population	0.47
Density of CHWs per 10 000 population	68.81
% of health managers out of total health workforce	0.31
% nurses/midwives out of total health workforce	24.73
Community health worker to nurse/midwife ratio	1.66
Nurse/midwife to physician ratio	8.76
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

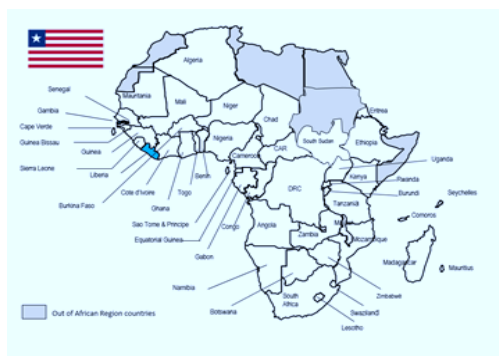
Health Workers in 2005 and 2018



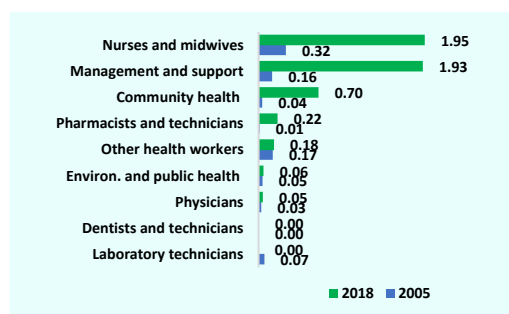
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	89	6	998	3	1 021	79
Nurses and midwives	1 123	73	8 741	25	678	52
Dentists and technicians	16	1	159	0	894	69
Pharmacists and technicians	62	4	398	1	542	42
Environmental and public health workers	55	4	144	0	162	12
Laboratory technicians	146	10	205	1	40	3
Community health workers	0	0	14 508	41	-	-
Management and support workers	18	1	110	0	511	39
Other health workers	23	2	10 084	29	43 743	3 365
Total	1 532	100	35 347	100	2 207	170

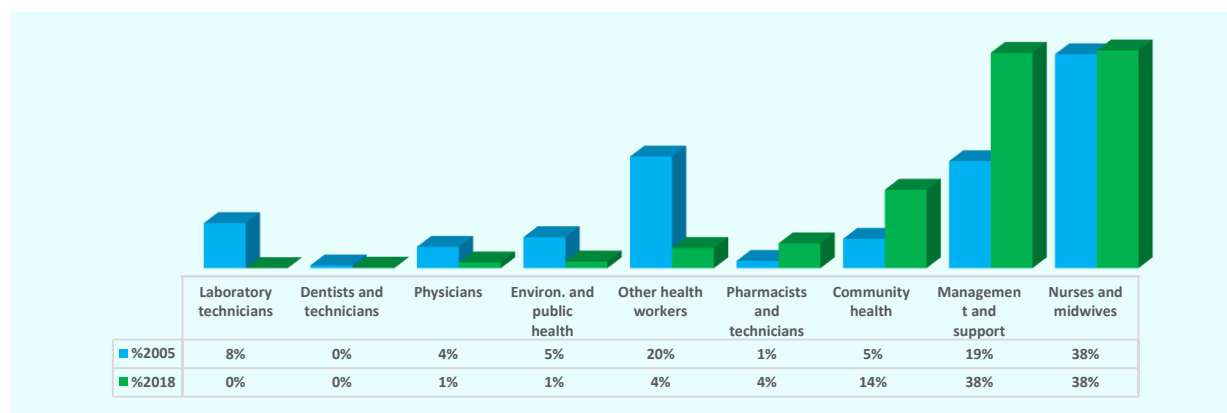
### Liberia



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



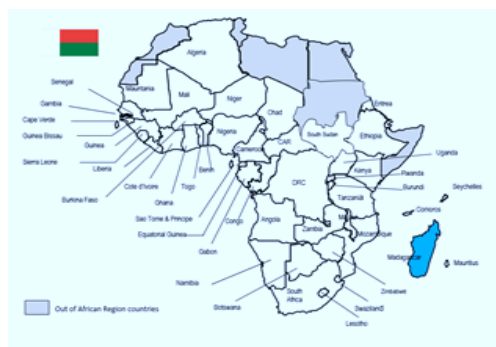
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	103	4	246	1	139	11
Nurses and midwives	1 035	38	9 415	38	810	62
Dentists and technicians	13	0	24	0	85	7
Pharmacists and technicians	35	1	1 071	4	2 960	228
Environmental and public health workers	150	5	285	1	90	7
Laboratory technicians	218	8	0	0	-100	-8
Community health workers	142	5	3 391	14	2 288	176
Management and support workers	518	19	1 404	6	171	13
Other health workers	540	20	8 784	36	1 527	117
Total	2 754	100	24 620	100	794	61

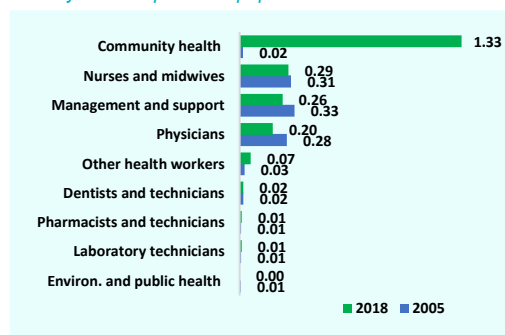
Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	34.7
Crude death rates per 1000 mid-year total population	8.1
Under-five mortality rate	69.9
Maternal mortality ratio per 100 000 live births	725.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.95
Density of physicians per 1000 population	0.05
Density of CHWs per 10 000 population	7.04
% of health managers out of total health workforce	5.70
% nurses/midwives out of total health workforce	38.24
Community health worker to nurse/midwife ratio	0.36
Nurse/midwife to physician ratio	38.27
Existence of investment case study for HRH	Yes
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

### Madagascar



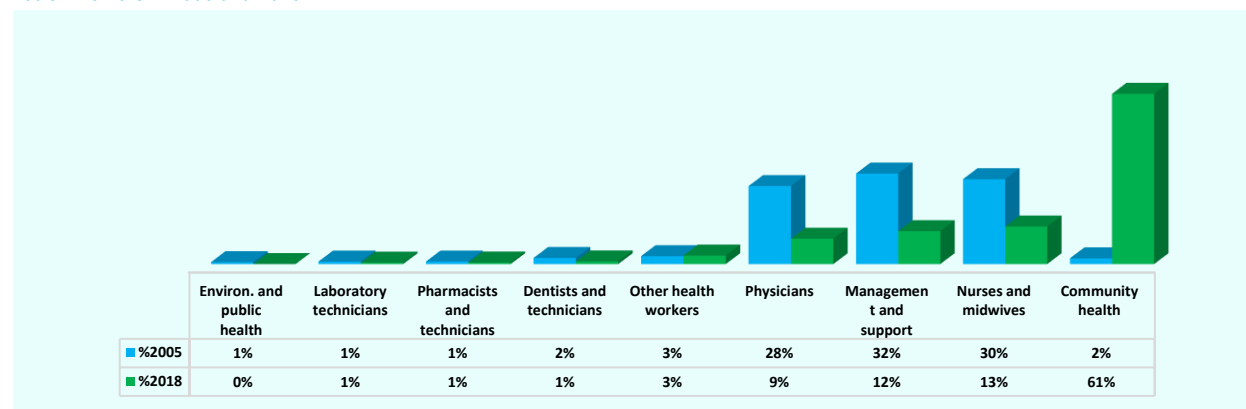
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	33.4
Crude death rates per 1000 mid-year total population	6.5
Under-five mortality rate	49.6
Maternal mortality ratio per 100 000 live births	353.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.29
Density of physicians per 1000 population	0.20
Density of CHWs per 10 000 population	13.33
% of health managers out of total health workforce	0.71
% nurses/midwives out of total health workforce	13.39
Community health worker to nurse/midwife ratio	4.53
Nurse/midwife to physician ratio	1.48
Existence of investment case study for HRH	Yes
Existence of national HRH policy	No
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

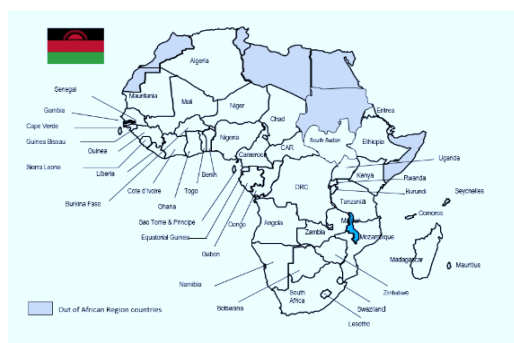
Health Workers in 2005 and 2018



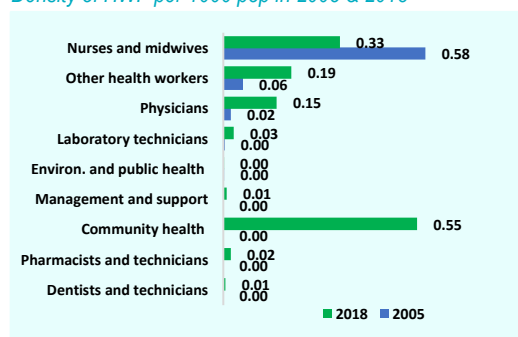
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	5 201	28	5 230	9	1	0
Nurses and midwives	5 661	30	7 724	13	36	3
Dentists and technicians	410	2	556	1	36	3
Pharmacists and technicians	175	1	329	1	88	7
Environmental and public health workers	130	1	15	0	-88	-7
Laboratory technicians	172	1	306	1	78	6
Community health workers	385	2	35 000	61	8 991	692
Management and support workers	6 036	32	411	1	-93	-7
Other health workers	530	3	8 114	14	1 431	110
Total	18 700	100	57 685	100	208	16

### Malawi



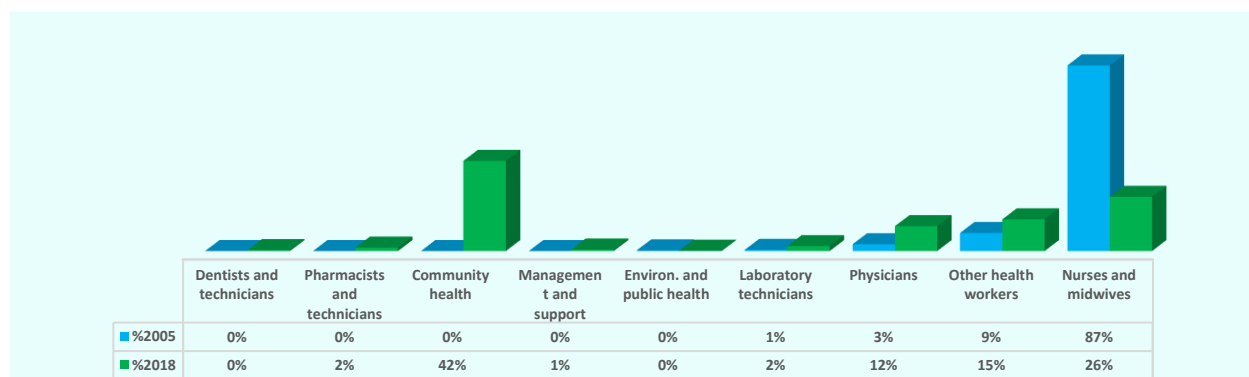
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	37.1
Crude death rates per 1000 mid-year total population	7.5
Under-five mortality rate	64.0
Maternal mortality ratio per 100 000 live births	634.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.33
Density of physicians per 1000 population	0.14
Density of CHWs per 10 000 population	5.52
% of health managers out of total health workforce	0.76
% nurses/midwives out of total health workforce	25.73
Community health worker to nurse/midwife ratio	1.66
Nurse/midwife to physician ratio	2.31
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

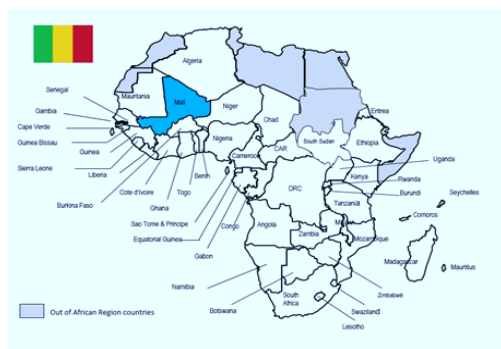
Health Workers in 2005 and 2018



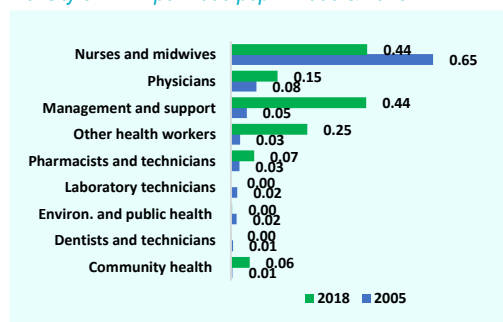
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	266	3	2 603	11	879	68
Nurses and midwives	7 264	87	6 025	26	-17	-1
Dentists and technicians	0	0	112	0	-	-
Pharmacists and technicians	0	0	387	2	-	-
Environmental and public health workers	26	0	35	0	35	3
Laboratory technicians	46	1	542	2	1 078	83
Community health workers	0	0	10 016	43	-	-
Management and support workers	0	0	178	1	-	-
Other health workers	707	9	3 520	15	398	31
Total	8 309	100	23 418	100	182	14

Mali



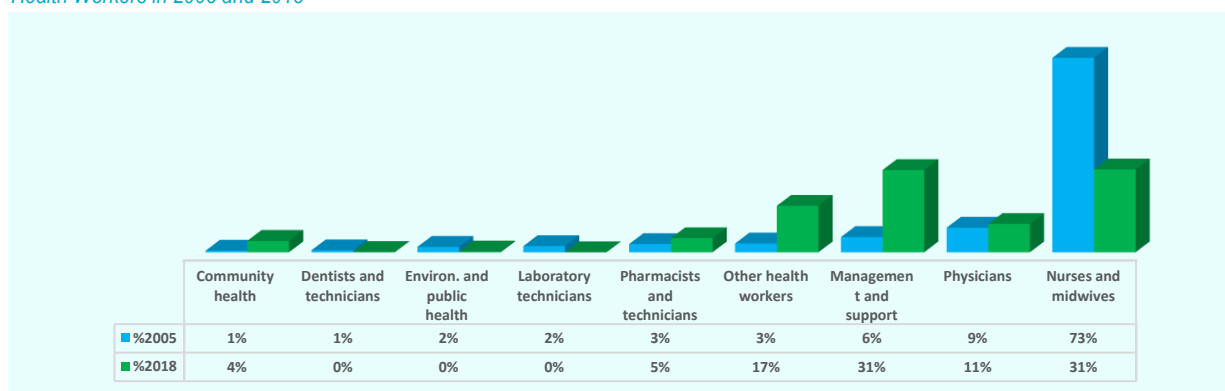
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	43.2
Crude death rates per 1000 mid-year total population	10.7
Under-five mortality rate	114.7
Maternal mortality ratio per 100 000 live births	587.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.44
Density of physicians per 1000 population	0.15
Density of CHWs per 10 000 population	0.60
% of health managers out of total health workforce	0.09
% nurses/midwives out of total health workforce	31.12
Community health worker to nurse/midwife ratio	0.14
Nurse/midwife to physician ratio	2.93
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

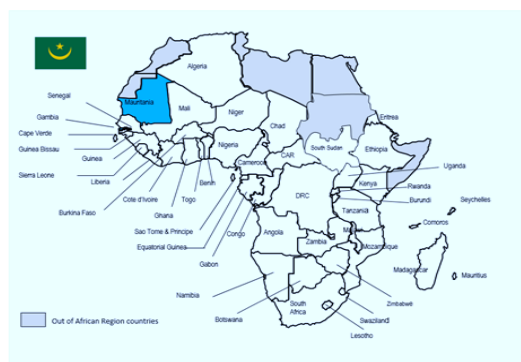
Health Workers in 2005 and 2018



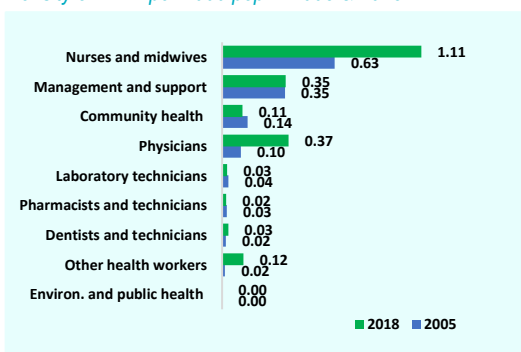
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	1 053	9	2 866	11	172	13
Nurses and midwives	8 338	73	8 394	31	1	0
Dentists and technicians	84	1	30	0	-64	-5
Pharmacists and technicians	351	3	1 424	5	306	24
Environmental and public health workers	231	2	78	0	-66	-5
Laboratory technicians	264	2	0	0	-100	-8
Community health workers	68	1	1 152	4	1 594	123
Management and support workers	652	6	25	0	-96	-7
Other health workers	377	3	13 007	48	3 350	258
Total	11 418	100	26 976	100	136	10

### Mauritania



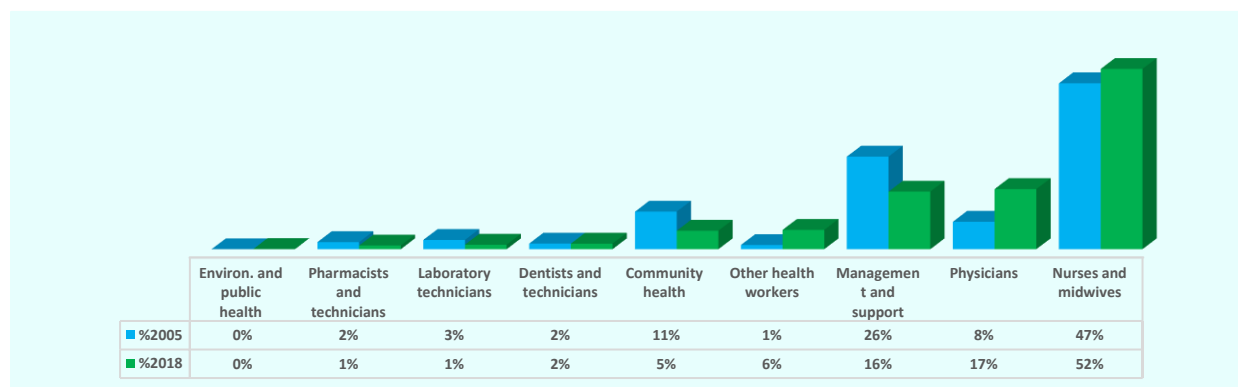
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	34.6
Crude death rates per 1000 mid-year total population	8.0
Under-five mortality rate	84.7
Maternal mortality ratio per 100 000 live births	602.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.11
Density of physicians per 1000 population	0.37
Density of CHWs per 10 000 population	1.14
% of health managers out of total health workforce	0.21
% nurses/midwives out of total health workforce	51.53
Community health worker to nurse/midwife ratio	0.10
Nurse/midwife to physician ratio	3.00
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018

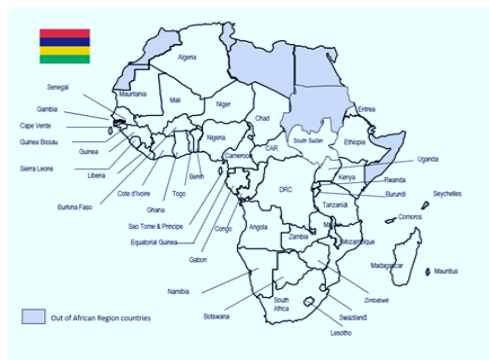


Health Workers in 2005 and 2018

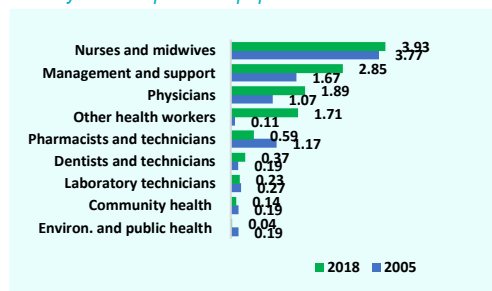
Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	313	8	1 626	17	419	32
Nurses and midwives	1 893	47	4 872	52	157	12
Dentists and technicians	64	2	151	2	136	10
Pharmacists and technicians	81	2	100	1	23	2
Environmental and public health workers	0	0	5	0	-	-
Laboratory technicians	106	3	122	1	15	1
Community health workers	429	11	500	5	17	1
Management and support workers	1 056	26	20	0	-98	-8
Other health workers	48	1	2 058	22	4 188	322
Total	3 990	100	9 454	100	137	11



### Mauritius



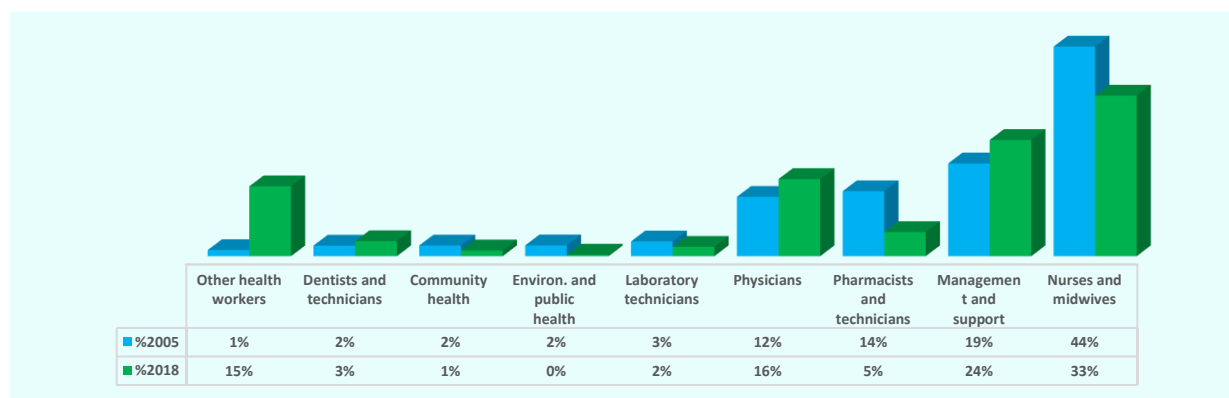
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	10.1
Crude death rates per 1000 mid-year total population	7.7
Under-five mortality rate	13.5
Maternal mortality ratio per 100 000 live births	53.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	3.93
Density of physicians per 1000 population	1.89
Density of CHWs per 10 000 population	1.42
% of health managers out of total health workforce	2.11
% nurses/midwives out of total health workforce	33.48
Community health worker to nurse/midwife ratio	0.04
Nurse/midwife to physician ratio	2.08
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

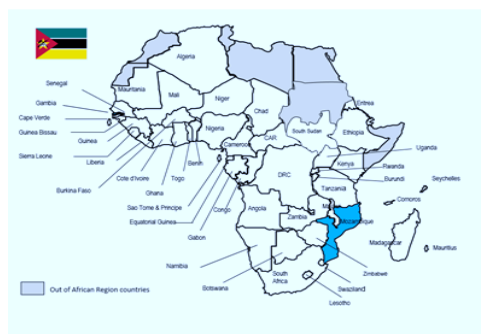
Health Workers in 2005 and 2018



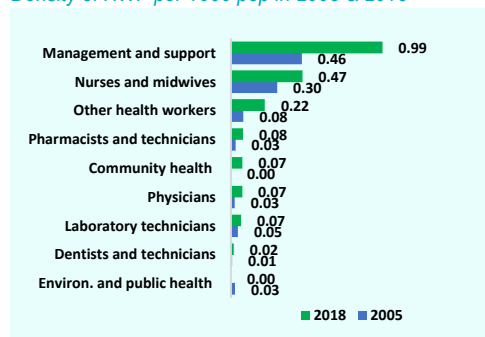
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	1 303	12	2 395	16	84	6
Nurses and midwives	4 604	44	4 986	33	8	1
Dentists and technicians	233	2	466	3	100	8
Pharmacists and technicians	1 428	14	748	5	-48	-4
Environmental and public health workers	238	2	48	0	-80	-6
Laboratory technicians	324	3	291	2	-10	-1
Community health workers	236	2	180	1	-24	-2
Management and support workers	2 038	19	315	2	-85	-7
Other health workers	134	1	5 465	37	3 978	306
Total	10 538	100	14 894	100	41	3

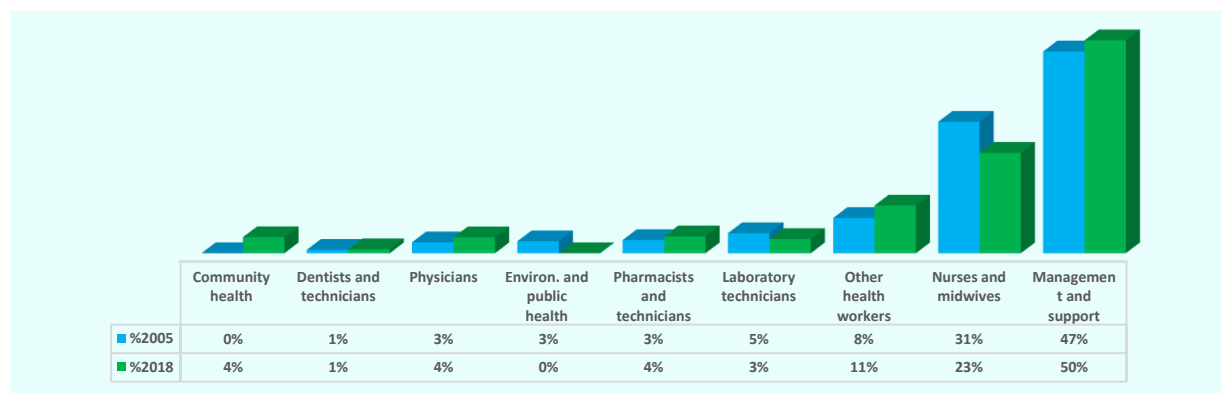
## Mozambique



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



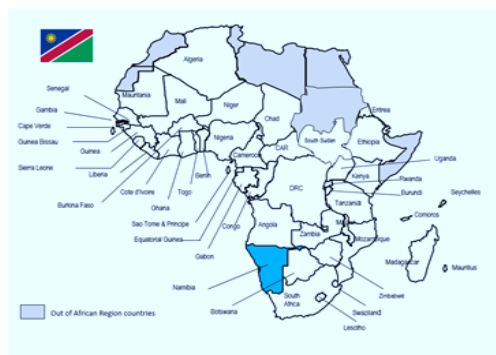
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	514	3	2 180	4	324	25
Nurses and midwives	6 183	31	13 781	23	123	9
Dentists and technicians	159	1	545	1	243	19
Pharmacists and technicians	618	3	2 310	4	274	21
Environmental and public health workers	564	3	0	0	-100	-8
Laboratory technicians	941	5	1 951	3	107	8
Community health workers	0	0	2 205	4	-	-
Management and support workers	9 491	47	2 466	4	-74	-6
Other health workers	1 659	8	33 279	57	1 906	147
Total	20 129	100	58 717	100	192	15

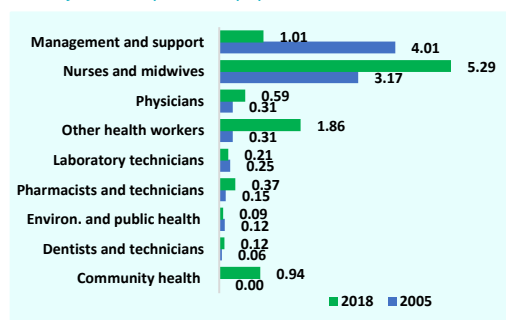
Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	39.4
Crude death rates per 1000 mid-year total population	10.4
Under-five mortality rate	78.5
Maternal mortality ratio per 100 000 live births	489.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.47
Density of physicians per 1000 population	0.07
Density of CHWs per 10 000 population	0.75
% of health managers out of total health workforce	4.20
% nurses/midwives out of total health workforce	23.47
Community health worker to nurse/midwife ratio	0.16
Nurse/midwife to physician ratio	6.32
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	Yes
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	Yes
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

### Namibia



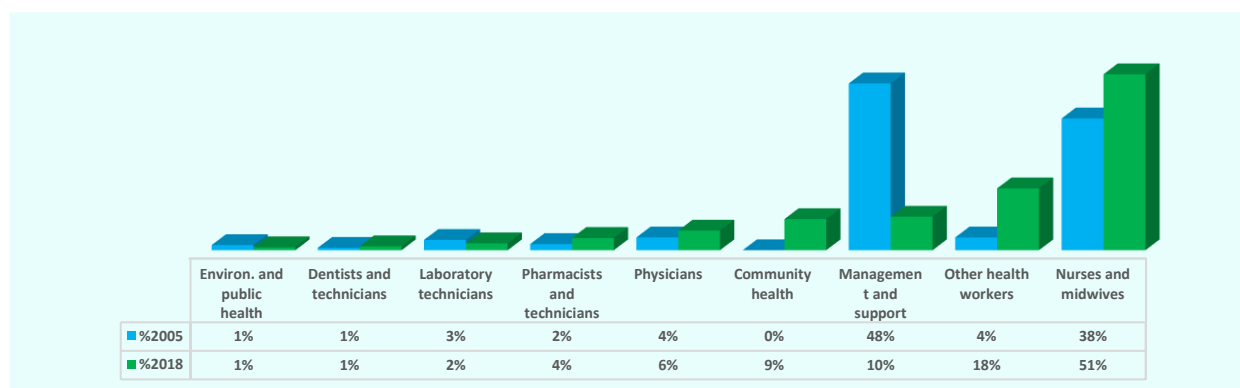
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	29.6
Crude death rates per 1000 mid-year total population	7.5
Under-five mortality rate	45.4
Maternal mortality ratio per 100 000 live births	265.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	5.29
Density of physicians per 1000 population	0.59
Density of CHWs per 10 000 population	9.36
% of health managers out of total health workforce	1.22
% nurses/midwives out of total health workforce	50.53
Community health worker to nurse/midwife ratio	0.18
Nurse/midwife to physician ratio	8.97
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	Yes
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018



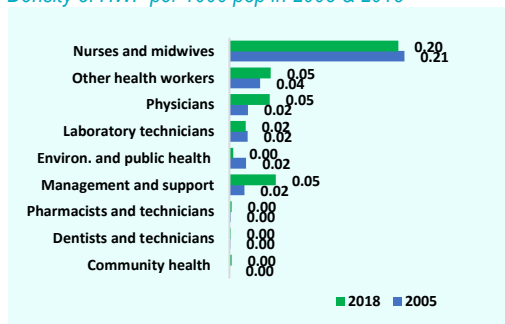
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	598	4	1 445	6	142	11
Nurses and midwives	6 145	38	12 956	51	111	9
Dentists and technicians	113	1	289	1	156	12
Pharmacists and technicians	288	2	907	4	215	17
Environmental and public health workers	240	1	218	1	-9	-1
Laboratory technicians	481	3	510	2	6	0
Community health workers	0	0	2 292	9	-	-
Management and support workers	7 782	48	313	1	-96	-7
Other health workers	597	4	6 710	26	1 024	79
Total	16 244	100	25 640	100	58	4

## Niger



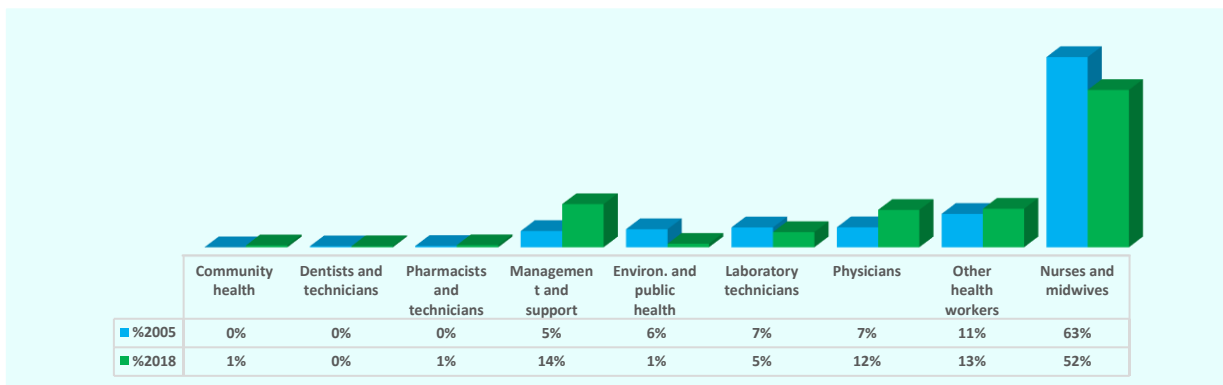
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	48.4
Crude death rates per 1000 mid-year total population	9.9
Under-five mortality rate	95.5
Maternal mortality ratio per 100 000 live births	553.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.20
Density of physicians per 1000 population	0.05
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	2.64
% nurses/midwives out of total health workforce	52.41
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	4.21
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018



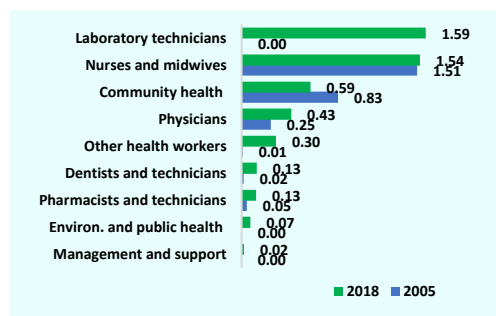
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	296	7	1 065	12	260	20
Nurses and midwives	2 818	63	4 483	52	59	5
Dentists and technicians	15	0	30	0	100	8
Pharmacists and technicians	20	0	60	1	200	15
Environmental and public health workers	268	6	101	1	-62	-5
Laboratory technicians	294	7	432	5	47	4
Community health workers	0	0	0	0	-	-
Management and support workers	241	5	226	3	-6	0
Other health workers	495	11	2 157	25	336	26
Total	4 447	100	8 554	100	92	7

## Nigeria



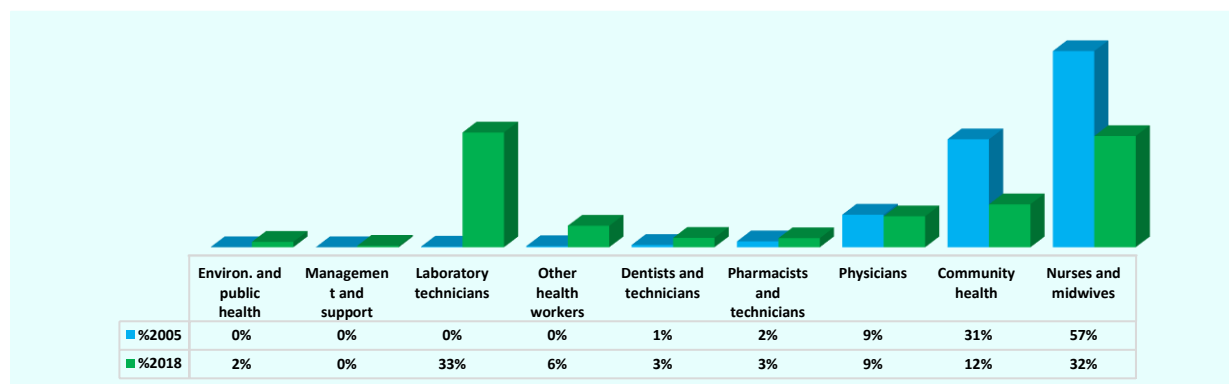
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	39.4
Crude death rates per 1000 mid-year total population	12.8
Under-five mortality rate	108.8
Maternal mortality ratio per 100 000 live births	814.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.54
Density of physicians per 1000 population	0.40
Density of CHWs per 10 000 population	5.95
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	47.69
Community health worker to nurse/midwife ratio	0.39
Nurse/midwife to physician ratio	3.89
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	No
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

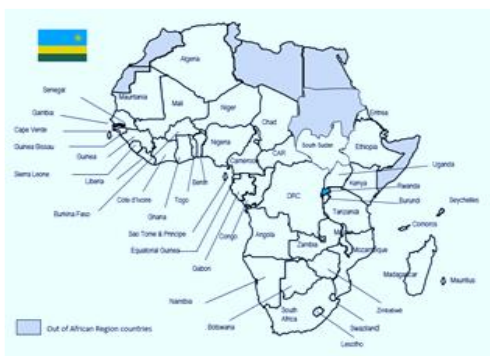
Health Workers in 2005 and 2018



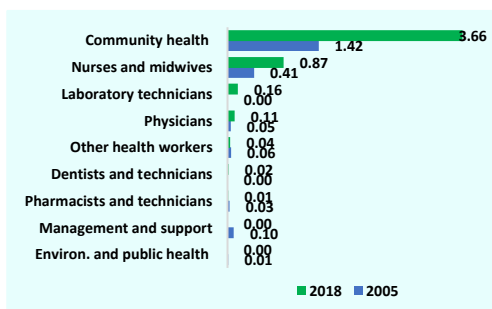
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	34 923	9	77 578	12	122	9
Nurses and midwives	210 306	57	301 579	48	43	3
Dentists and technicians	2 482	1	21 592	3	770	59
Pharmacists and technicians	6 344	2	30 461	5	380	29
Environmental and public health workers	0	0	0	0	-	-
Laboratory technicians	690	0	71 269	11	10 229	787
Community health workers	115 761	31	116 454	18	1	0
Management and support workers	0	0	0	0	-	-
Other health workers	1 220	0	13 392	2	998	77
Total	371 726	100	632 325	100	70	5

Rwanda



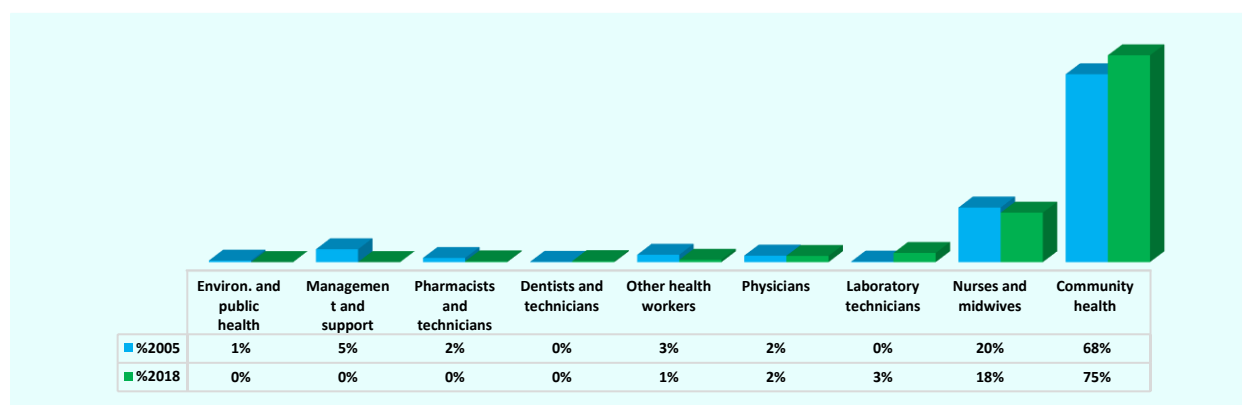
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	31.8
Crude death rates per 1000 mid-year total population	6.1
Under-five mortality rate	41.7
Maternal mortality ratio per 100 000 live births	290.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.87
Density of physicians per 1000 population	0.11
Density of CHWs per 10 000 population	36.58
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	17.93
Community health worker to nurse/midwife ratio	4.18
Nurse/midwife to physician ratio	7.97
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	Yes
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018



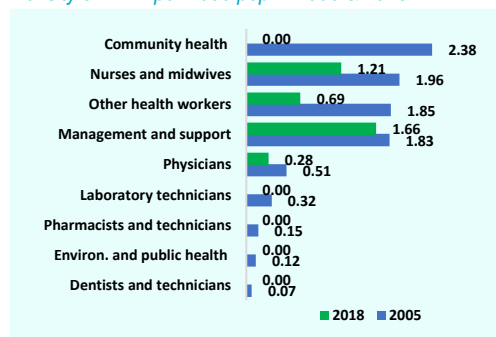
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	432	2	1 350	2	213	16
Nurses and midwives	3 647	20	10 758	18	195	15
Dentists and technicians	21	0	228	0	986	76
Pharmacists and technicians	278	2	167	0	-40	-3
Environmental and public health workers	101	1	0	0	-100	-8
Laboratory technicians	39	0	1 990	3	5 003	385
Community health workers	12 557	68	45 000	75	258	20
Management and support workers	862	5	0	0	-100	-8
Other health workers	490	3	503	1	3	0
Total	18 427	100	59 996	100	226	17

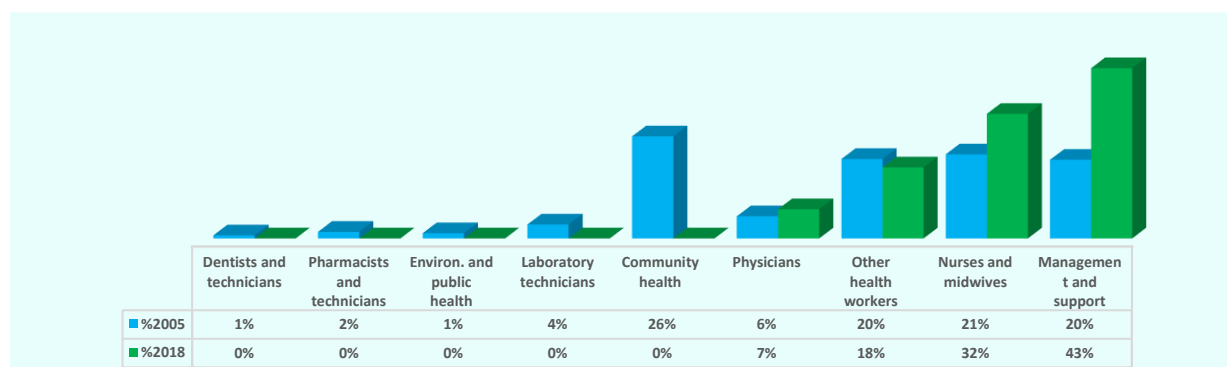
### Sao Tome and Principe



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	81	6	114	12	41	3
Nurses and midwives	308	21	537	58	74	6
Dentists and technicians	11	1	9	1	-18	-1
Pharmacists and technicians	24	2	80	9	233	18
Environmental and public health workers	19	1	0	0	-100	-8
Laboratory technicians	51	4	84	9	65	5
Community health workers	374	26	62	7	-83	-6
Management and support workers	288	20	0	0	-100	-8
Other health workers	291	20	35	4	-88	-7
Total	1 447	100	921	100	-36	-3

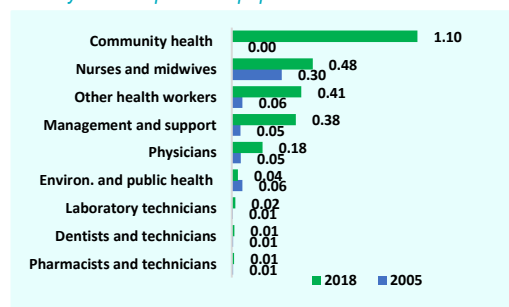
Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	34.3
Crude death rates per 1000 mid-year total population	6.8
Under-five mortality rate	47.3
Maternal mortality ratio per 100 000 live births	156.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	2.54
Density of physicians per 1000 population	0.54
Density of CHWs per 10 000 population	2.94
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	58.31
Community health worker to nurse/midwife ratio	0.12
Nurse/midwife to physician ratio	4.71
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

## Senegal



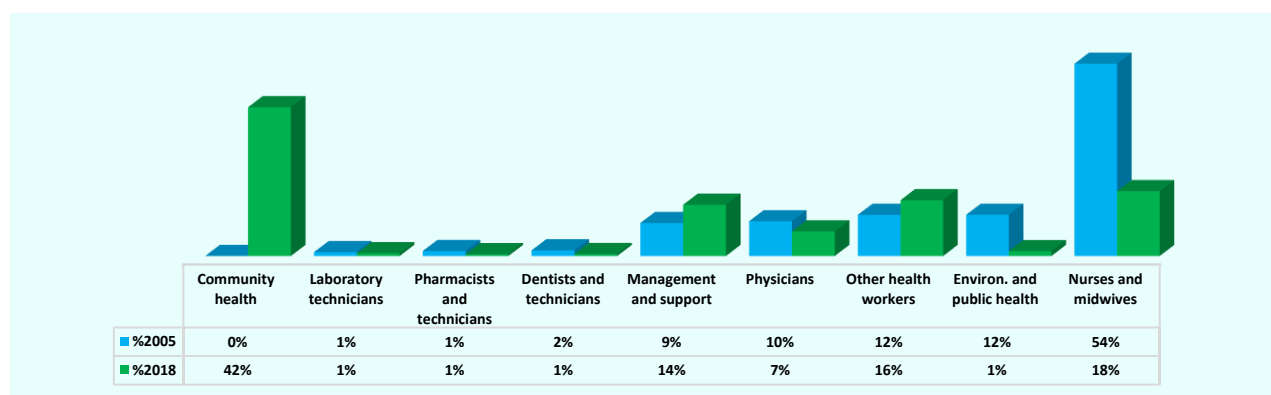
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	36.2
Crude death rates per 1000 mid-year total population	6.1
Under-five mortality rate	47.2
Maternal mortality ratio per 100 000 live births	315.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.48
Density of physicians per 1000 population	0.18
Density of CHWs per 10 000 population	10.99
% of health managers out of total health workforce	0.32
% nurses/midwives out of total health workforce	18.17
Community health worker to nurse/midwife ratio	2.29
Nurse/midwife to physician ratio	2.63
Existence of investment case study for HRH	Yes
Existence of national HRH policy	No
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018

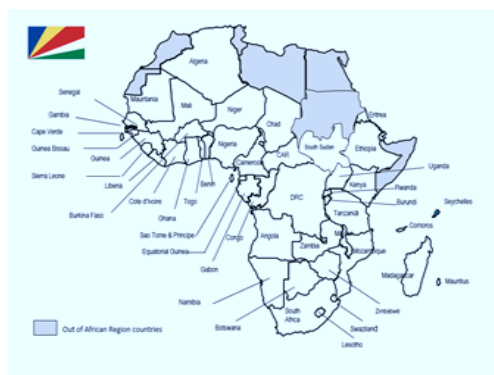


Health Workers in 2005 and 2018

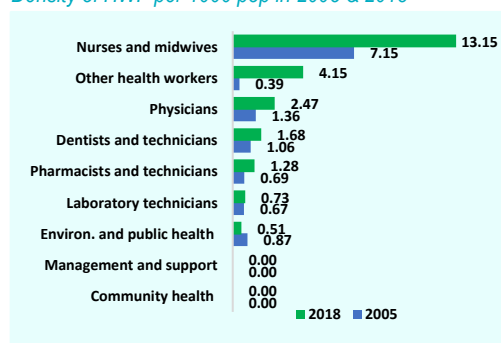
Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	594	10	2 883	7	385	30
Nurses and midwives	3 287	54	7 592	18	131	10
Dentists and technicians	97	2	236	1	143	11
Pharmacists and technicians	85	1	215	1	153	12
Environmental and public health workers	705	12	573	1	-19	-1
Laboratory technicians	66	1	328	1	397	31
Community health workers	0	0	17 417	42	-	-
Management and support workers	564	9	135	0	-76	-6
Other health workers	704	12	12 402	30	1 662	128
Total	6 102	100	41 781	100	585	45



### Seychelles



Density of HWF per 1000 pop in 2005 & 2018

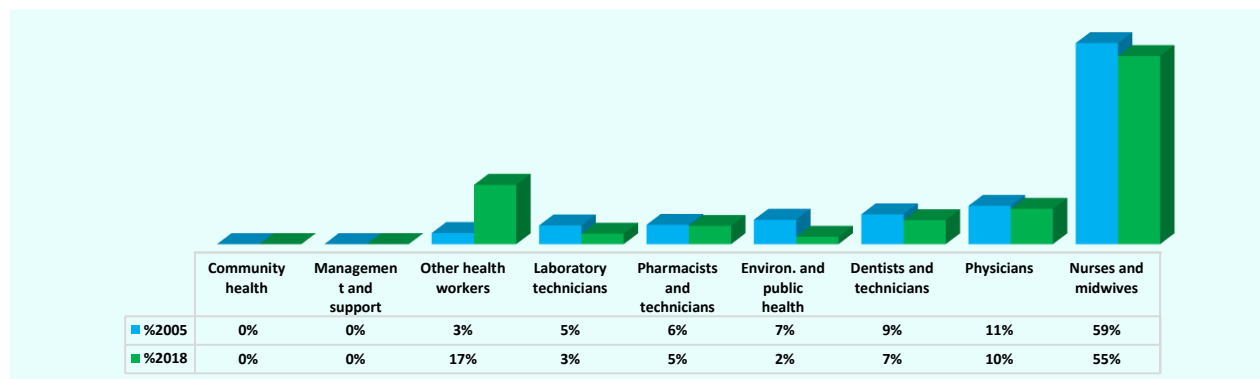


Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	17.0
Crude death rates per 1000 mid-year total population	7.5
Under-five mortality rate	13.6
Maternal mortality ratio per 100 000 live births	nd
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	6.68
Density of physicians per 1000 population	2.47
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	38.06
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	2.7
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); nd = No data

\*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018



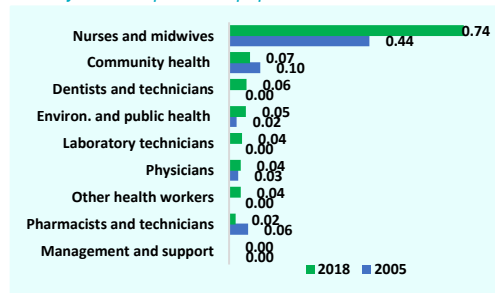
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	121	0	240	14	98	8
Nurses and midwives	634	1	649	38	2	0
Dentists and technicians	94	0	152	9	62	5
Pharmacists and technicians	61	0	135	8	121	9
Environmental and public health workers	77	0	69	4	-10	-1
Laboratory technicians	59	0	54	3	-8	-1
Community health workers	0	0	0	0	-	-
Management and support workers	0	0	31	2	-	-
Other health workers	35	0	375	22	971	75
Total	1081	2	1,705	100	-97	-7

### Sierra Leone



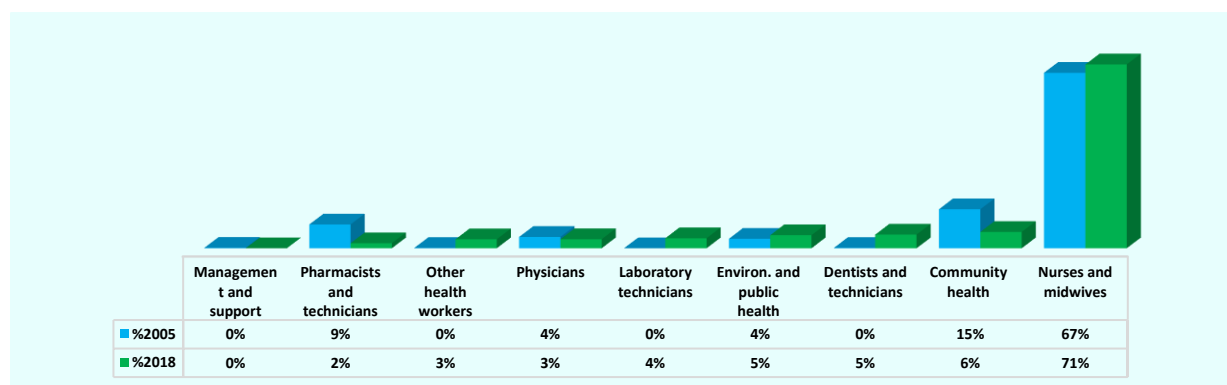
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	35.6
Crude death rates per 1000 mid-year total population	13.0
Under-five mortality rate	120.4
Maternal mortality ratio per 100 000 live births	1360.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.74
Density of physicians per 1000 population	0.04
Density of CHWs per 10 000 population	0.66
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	70.69
Community health worker to nurse/midwife ratio	0.09
Nurse/midwife to physician ratio	20.26
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	Yes
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

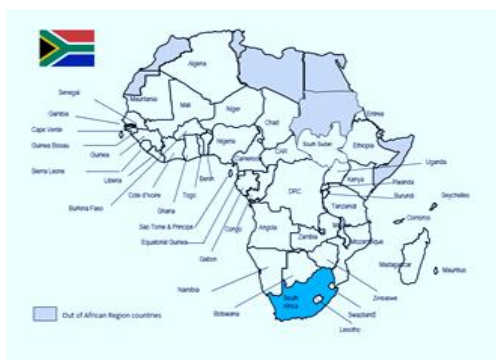
Health Workers in 2005 and 2018



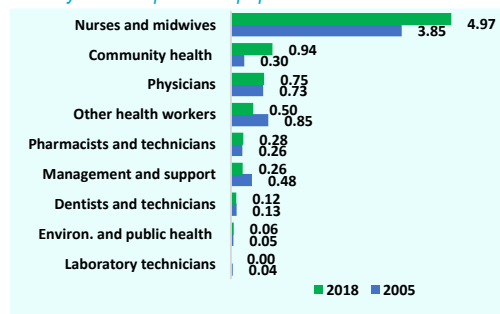
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	162	4	281	3	73	6
Nurses and midwives	2 510	67	5 693	71	127	10
Dentists and technicians	5	0	423	5	8 360	643
Pharmacists and technicians	340	9	156	2	-54	-4
Environmental and public health workers	136	4	406	5	199	15
Laboratory technicians	0	0	311	4	-	-
Community health workers	558	15	505	6	-9	-1
Management and support workers	6	0	0	0	-100	-8
Other health workers	4	0	279	3	6 875	529
Total	3 721	100	8 054	100	116	9

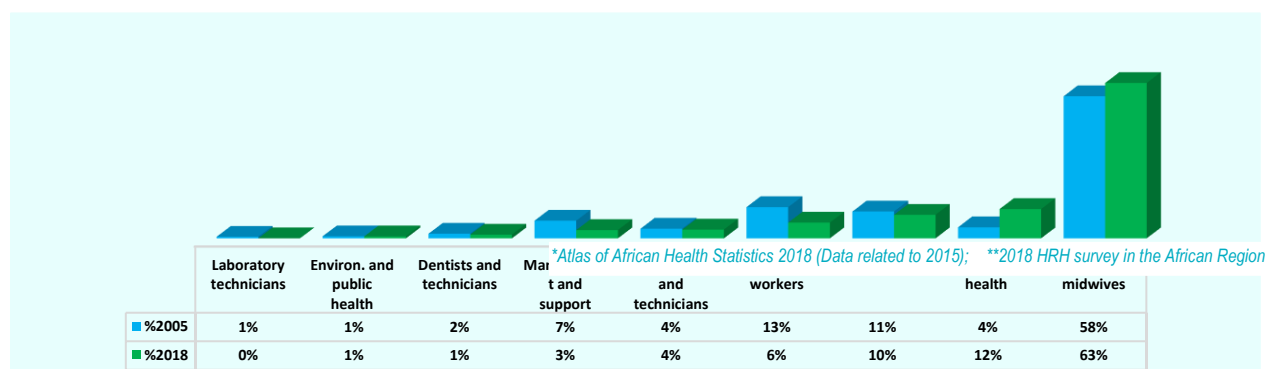
### South Africa



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018

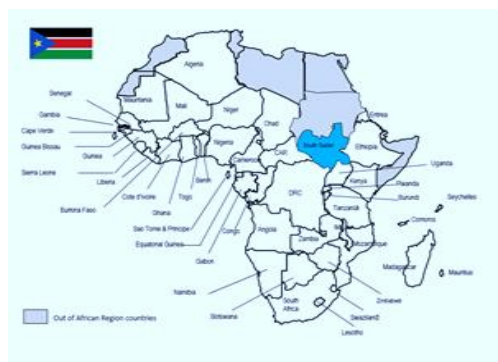


Health Workers in 2005 and 2018

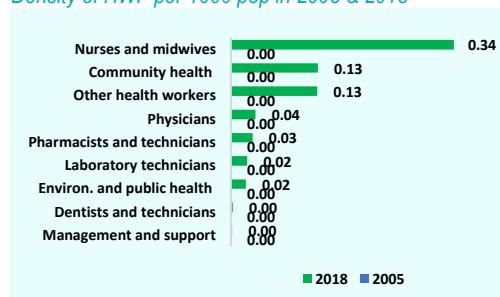
Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	34 829	11	43 503	10	25	2
Nurses and midwives	184 459	58	287 458	63	56	4
Dentists and technicians	5 995	2	6 816	1	14	1
Pharmacists and technicians	12 521	4	16 195	4	29	2
Environmental and public health workers	2 529	1	3 585	1	42	3
Laboratory technicians	2 002	1	0	0	-100	-8
Community health workers	14 306	4	54 180	12	279	21
Management and support workers	22 859	7	15 266	3	-33	-3
Other health workers	40 492	13	29 039	6	-28	-2
Total	319 992	100	456 042	100	43	3

Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	21.3
Crude death rates per 1000 mid-year total population	10.1
Under-five mortality rate	40.5
Maternal mortality ratio per 100 000 live births	138.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	4.97
Density of physicians per 1000 population	0.75
Density of CHWs per 10 000 population	9.34
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	63.03
Community health worker to nurse/midwife ratio	0.19
Nurse/midwife to physician ratio	6.6
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	No
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	No

### South Sudan



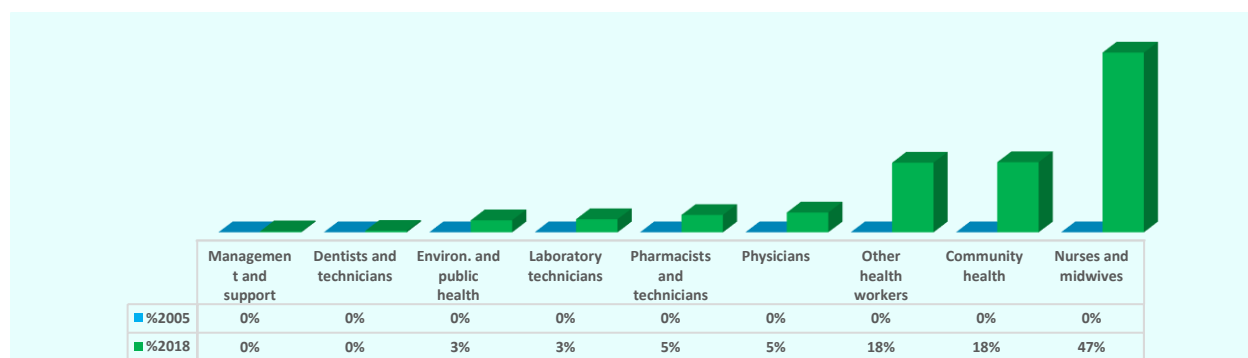
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	36.3
Crude death rates per 1000 mid-year total population	11.2
Under-five mortality rate	0.0
Maternal mortality ratio per 100 000 live births	789.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.35
Density of physicians per 1000 population	0.04
Density of CHWs per 10 000 population	1.38
% of health managers out of total health workforce	0.18
% nurses/midwives out of total health workforce	34.35
Community health worker to nurse/midwife ratio	0.39
Nurse/midwife to physician ratio	9.1
Existence of investment case study for HRH	No
Existence of national HRH policy	No
Existence of national HRH strategic plan	No
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	No
Existence of an accreditation body for health sciences schools	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

Health Workers in 2005 and 2018

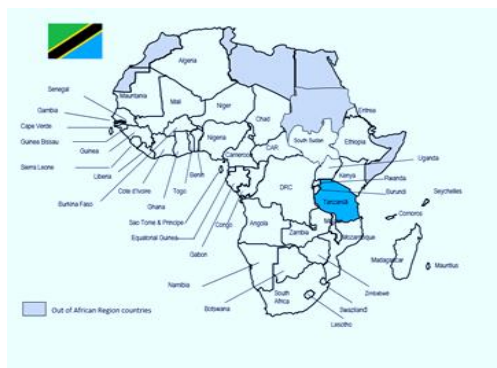


Health Workers in 2005 and 2018

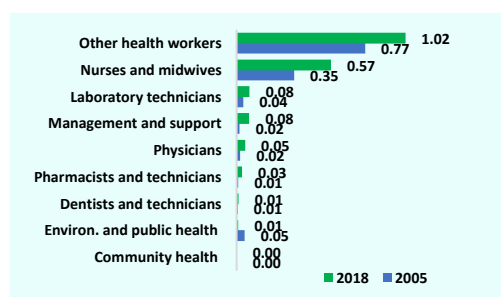
Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	-	-	411	4	-	-
Nurses and midwives	-	-	3 726	34	-	-
Dentists and technicians	-	-	32	0	-	-
Pharmacists and technicians	-	-	360	3	-	-
Environmental and public health workers	-	-	250	2	-	-
Laboratory technicians	-	-	272	3	-	-
Community health workers	-	-	1 455	13	-	-
Management and support workers	-	-	2 897	27	-	-
Other health workers	-	-	1 444	13	-	-
Total	-	-	10 847	100	-	-

**NB:** In 2005, South Sudan did not exist as a WHO Member State

### Tanzania (United Republic of)



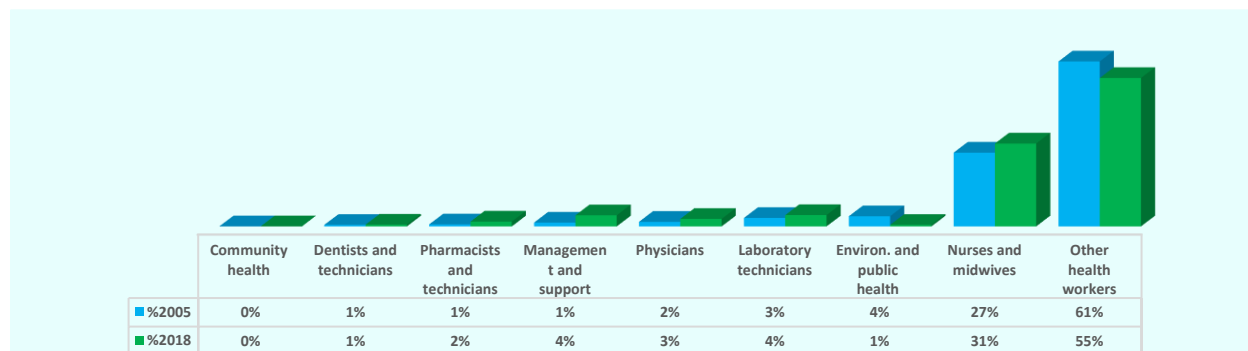
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	38.6
Crude death rates per 1000 mid-year total population	7.0
Under-five mortality rate	48.7
Maternal mortality ratio per 100 000 live births	398.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.57
Density of physicians per 1000 population	0.05
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	0.61
% nurses/midwives out of total health workforce	30.79
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	11.07
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	Yes
Existence of HRH country profile	No
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

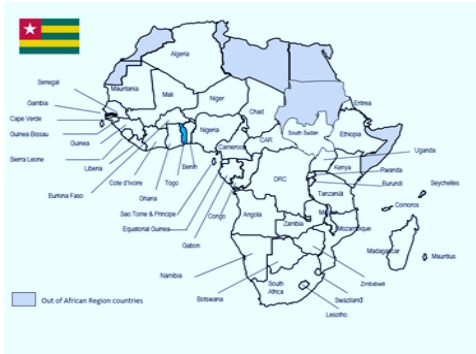
Health Workers in 2005 and 2018



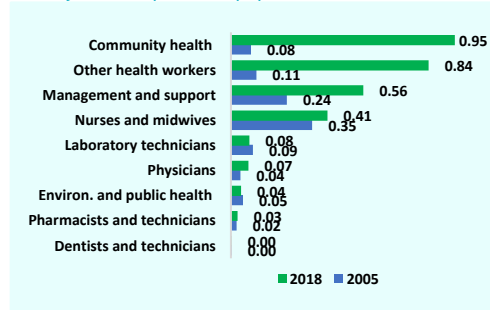
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	822	2	2 885	3	251	19
Nurses and midwives	13 292	27	31 940	31	140	11
Dentists and technicians	267	1	682	1	155	12
Pharmacists and technicians	365	1	1 845	2	405	31
Environmental and public health workers	1 831	4	578	1	-68	-5
Laboratory technicians	1 520	3	4 361	4	187	14
Community health workers	0	0	0	0	-	-
Management and support workers	689	1	633	1	-8	-1
Other health workers	29 722	61	60 818	59	105	8
Total	48 508	100	103 742	100	114	9

## Togo



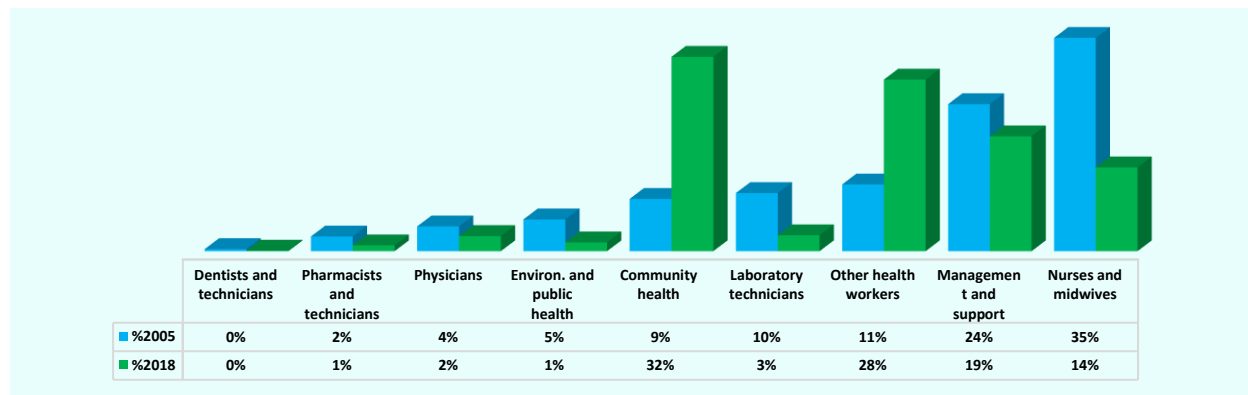
Density of HWF per 1000 pop in 2005 & 2018



Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	34.5
Crude death rates per 1000 mid-year total population	8.8
Under-five mortality rate	78.4
Maternal mortality ratio per 100 000 live births	368.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	0.41
Density of physicians per 1000 population	0.07
Density of CHWs per 10 000 population	9.51
% of health managers out of total health workforce	0.27
% nurses/midwives out of total health workforce	13.72
Community health worker to nurse/midwife ratio	2.32
Nurse/midwife to physician ratio	5.54
Existence of investment case study for HRH	Yes
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	Yes
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	No
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

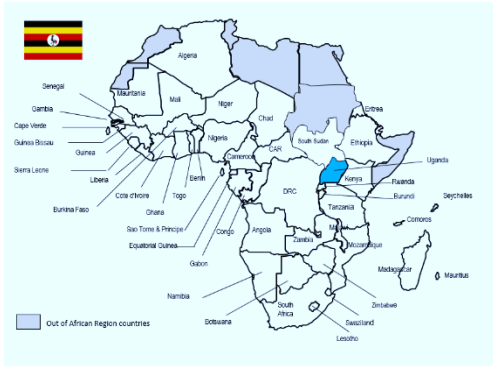
Health Workers in 2005 and 2018



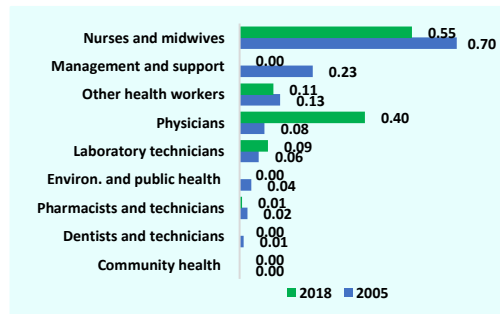
Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	225	4	584	2	160	12
Nurses and midwives	1 937	35	3 234	14	67	5
Dentists and technicians	19	0	21	0	11	1
Pharmacists and technicians	134	2	226	1	69	5
Environmental and public health workers	289	5	340	1	18	1
Laboratory technicians	528	10	615	3	16	1
Community health workers	475	9	7 500	32	1479	114
Management and support workers	1 335	24	63	0	-95	-7
Other health workers	606	11	10 993	47	1 714	132
Total	5 548	100	23 576	100	325	25

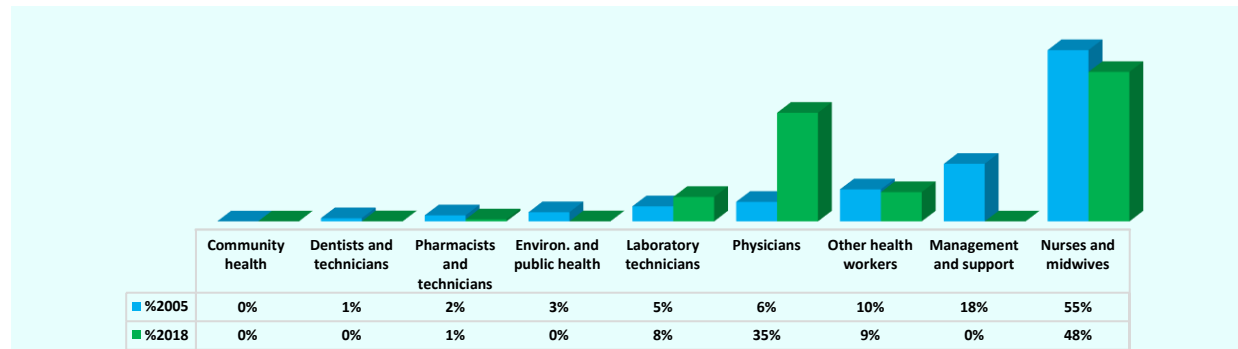
## Uganda



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



Health Workers in 2005 and 2018

Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	2 209	6	17 186	35	678	52
Nurses and midwives	19 325	55	23 644	48	22	2
Dentists and technicians	363	1	26	0	-93	-7
Pharmacists and technicians	688	2	324	1	-53	-4
Environmental and public health workers	1 042	3	16	0	-98	-8
Laboratory technicians	1 702	5	3 874	8	128	10
Community health workers	0	0	0	0	-	-
Management and support workers	6 499	18	0	0	-100	-8
Other health workers	3 617	10	4 630	9	28	2
Total	35 445	100	49 700	100	40	3

### Key Health Indicators \*

Crude birth rates per 1000 mid-year total population	42.6
Crude death rates per 1000 mid-year total population	8.9
Under-five mortality rate	54.6
Maternal mortality ratio per 100 000 live births	343.0

### Country Health Workforce status \*\*

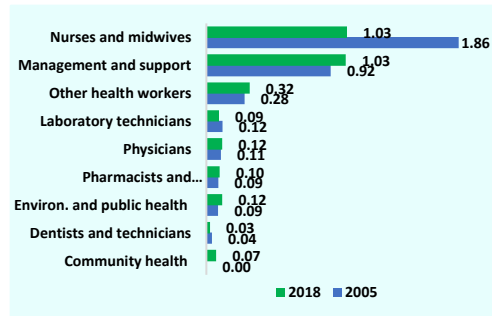
Density of nurses/midwives per 1000 population	0.55
Density of physicians per 1000 population	0.40
Density of CHWs per 10 000 population	0.00
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	47.57
Community health worker to nurse/midwife ratio	0.00
Nurse/midwife to physician ratio	1.38
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	Yes
Existence of a focal point for the national health workforce accounts	No
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

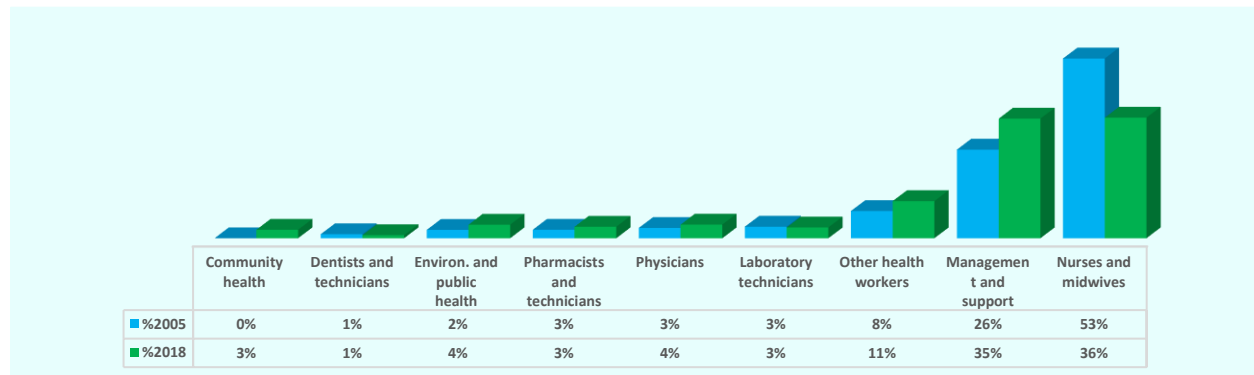
## Zambia



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



Health Workers in 2005 and 2018

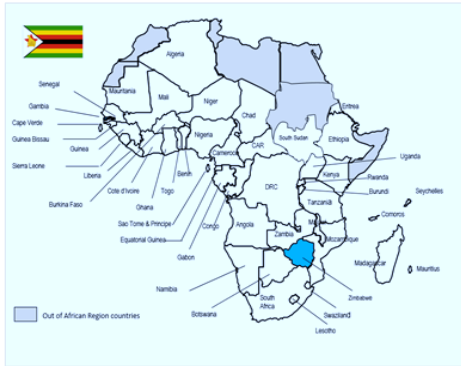
Categories	2005		2018		% Growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	1 264	3	2 026	4	60	5
Nurses and midwives	22 010	53	17 948	36	-18	-1
Dentists and technicians	491	1	455	1	-7	-1
Pharmacists and technicians	1 039	3	1 708	3	64	5
Environmental and public health workers	1 027	2	2 016	4	96	7
Laboratory technicians	1 415	3	1 602	3	13	1
Community health workers	0	0	1 262	3	-	-
Management and support workers	10 853	26	0	0	-100	-8
Other health workers	3 330	8	23 323	46	600	46
Total	41 429	100	50 340	100	22	2

Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	38.4
Crude death rates per 1000 mid-year total population	8.0
Under-five mortality rate	64.0
Maternal mortality ratio per 100 000 live births	224.0
Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.03
Density of physicians per 1000 population	0.12
Density of CHWs per 10 000 population	0.73
% of health managers out of total health workforce	0.00
% nurses/midwives out of total health workforce	35.65
Community health worker to nurse/midwife ratio	0.07
Nurse/midwife to physician ratio	8.86
Existence of investment case study for HRH	No
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	No
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	No

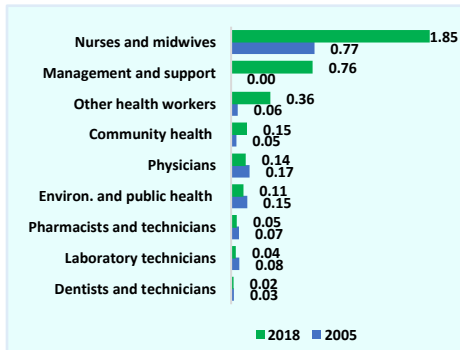
\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region



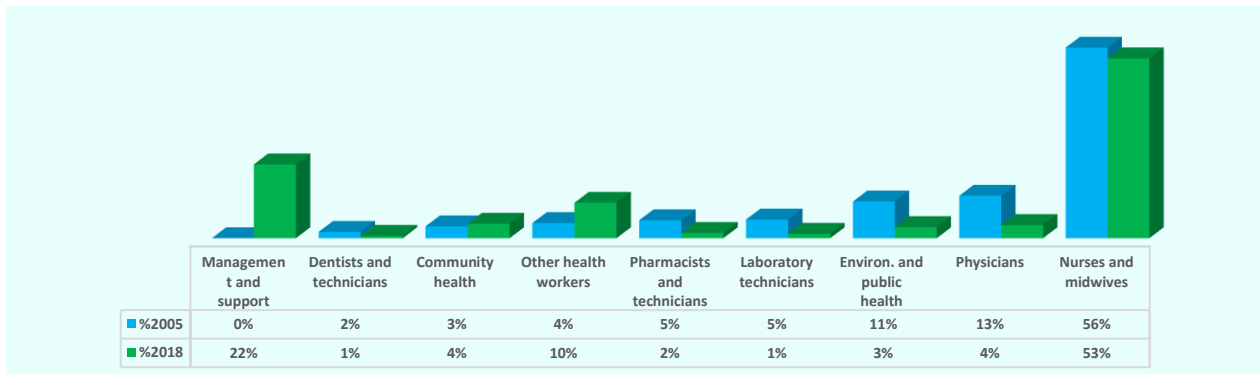
## Zimbabwe



Density of HWF per 1000 pop in 2005 & 2018



Health Workers in 2005 and 2018



Health Workers in 2005 and 2018

Categories	2005		2018		% growth (2005-2018)	% Annual growth rate
	Number	%	Number	%		
Physicians	2 086	13	1 959	4	-6	0
Nurses and midwives	9 357	56	26 689	53	185	14
Dentists and technicians	310	2	347	1	12	1
Pharmacists and technicians	883	5	776	2	-12	-1
Environmental and public health workers	1 803	11	1 644	3	-9	-1
Laboratory technicians	917	5	648	1	-29	-2
Community health workers	581	3	2 143	4	269	21
Management and support workers	0	0	327	1	-	-
Other health workers	743	4	15 881	32	2 037	157
Total	16 680	100	50 414	100	202	16

Key Health Indicators *	
Crude birth rates per 1000 mid-year total population	33.9
Crude death rates per 1000 mid-year total population	8.4
Under-five mortality rate	70.7
Maternal mortality ratio per 100 000 live births	443.0

Country Health Workforce status **	
Density of nurses/midwives per 1000 population	1.85
Density of physicians per 1000 population	0.14
Density of CHWs per 10 000 population	1.48
% of health managers out of total health workforce	0.65
% nurses/midwives out of total health workforce	52.94
Community health worker to nurse/midwife ratio	0.08
Nurse/midwife to physician ratio	13.62
Existence of investment case study for HRH	Yes
Existence of national HRH policy	Yes
Existence of national HRH strategic plan	Yes
Existence of an HRH department/directorate in the MoH	Yes
Existence of a functional national health workforce observatory	Yes
Existence of HRH country profile	Yes
Establishment of national health workforce accounts	No
Existence of a focal point for the national health workforce accounts	Yes
Existence of HRIS with regularly updated database	Yes
Existence of an accreditation body for health sciences schools	Yes
Existence of a commitment to increase allocation	Yes

\*Atlas of African Health Statistics 2018 (Data related to 2015); \*\*2018 HRH survey in the African Region

## 10. CONCLUSION

This 2018 HRH regional survey provided information on health workforce profile, education, training, accreditation, recruitment, working conditions, governance, management, and the roles and capacities of health professional bodies. This survey was conducted in the 47 Member States of the WHO African Region and provides the information needed on the health workforce for planning at the regional and national levels. The findings and lessons from the survey highlight the need to strengthen health workforce information systems and standardize data collection tools at the national and subnational levels to ensure that appropriate data are collected and available for planning. For this survey, given that different countries have different terminologies for health workforce occupations/cadres, the International Standard Classification of Occupations (ISCO-08) was used as a framework to provide a coherent classification for categorizing occupations. Member States should consider this classification in the design and standardization of health workforce management information systems.

The findings of this survey also provide evidence to guide countries in investing in the education, training, accreditation, recruitment, information systems, governance, management, and regulation of the health workforce, towards the achievement of national goals, UHC, and the SDGs.

As the COVID-19 pandemic was still raging at the time of publication of this report, its socioeconomic impact on countries as well as on health and the health workforce was yet to be evaluated and well understood. However, the plausible implications could be manifold. This, however, is beyond the scope of, and the data collected for this report. In light of the above plausible implications of COVID-19 on the health workforce, separate streams of work are at various stages of development to help shed light on the impact of COVID-19 on the workforce and explore the long-term mitigation measures that will ensure that health workers are well equipped to employ resilient and adaptive systems for Africa, towards universal health coverage.

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## Annex 1: Regional health workforce threshold for UHC service coverage

### Estimation of the HWF threshold for UHC service coverage of the African Region

Using universal health coverage service coverage as the outcome measure, a two-level structural equation model was specified and analysed in STATA 16. In the first level of structural equations, health expenditure per capita (HEC), one of the cross-cutting inputs for UHC, was used to explain the critical inputs for service delivery/coverage: health workforce (HWF) density, health facility density (HFD), essential medicines readiness (EMR) and diagnostic readiness which measures testing capability (DRT). In the second level of the model, the critical inputs for service delivery (HWF, HFD, EMR and DRT) were used to explain the (UHC) service coverage index. The model exhibited a high level of fitness for the data, explaining about 70% of it. Using a non-linear generalized reduced gradient (GRG) approach, an optimization was conducted using Microsoft excel solver® to simulate the most 'optimal' combination of the densities of cadres of the HWF at various targets of the UHC service coverage index. This is attainable when the other variables are controlled. The health workforce data was obtained from the 47 Members States through a regional health workforce survey conducted in 2019. Health workforce data was, however, available for 13 cadres of the health workforce for each country of the African Region. Data on essential medicines readiness and diagnostic readiness were both sourced from various service availability and readiness assessment (SARA) or harmonized health facility assessment (HHFA) reports. For countries where there has not been any or recent (last five years) SARA or HHFA assessment, multiple imputations were conducted to fill the data gaps. Data on health expenditure per capita and standardized health infrastructure were obtained from the Africa Health Observatory dataset available at the Data Analytics and Knowledge Management Unit of WHO AFRO, while the UHC service coverage index was extracted from the 2019 UHC monitoring report jointly published by WHO and the World Bank.

## List of health workers included in the analysis

#	ISCO-08 Code	Health Workers group
1	2211 & 2212	Medical doctors (generalists and specialists)
2	222, 2222, 3221 & 3222	Nurses and midwives (professionals and associates)
3	2261 & 3251	Dentists and dental technicians/assistants
4	2262 & 3213	Pharmacists, pharmacy technicians/assistants
5	3256	Medical assistants/clinical officers/physician assistants
6	3212	Medical and pathology laboratory scientists/technicians
7	3211	Medical imaging and therapeutic equipment operators
8	2264 & 3255	Physiotherapists and physiotherapy assistants
9	2267 & 3254	Optometrists and opticians
10	2240	Paramedical practitioners
11	2265	Dieticians and nutritionists
12	2263 & 3257	Environmental and occupational health and hygiene workers
13	3253	Community health workers

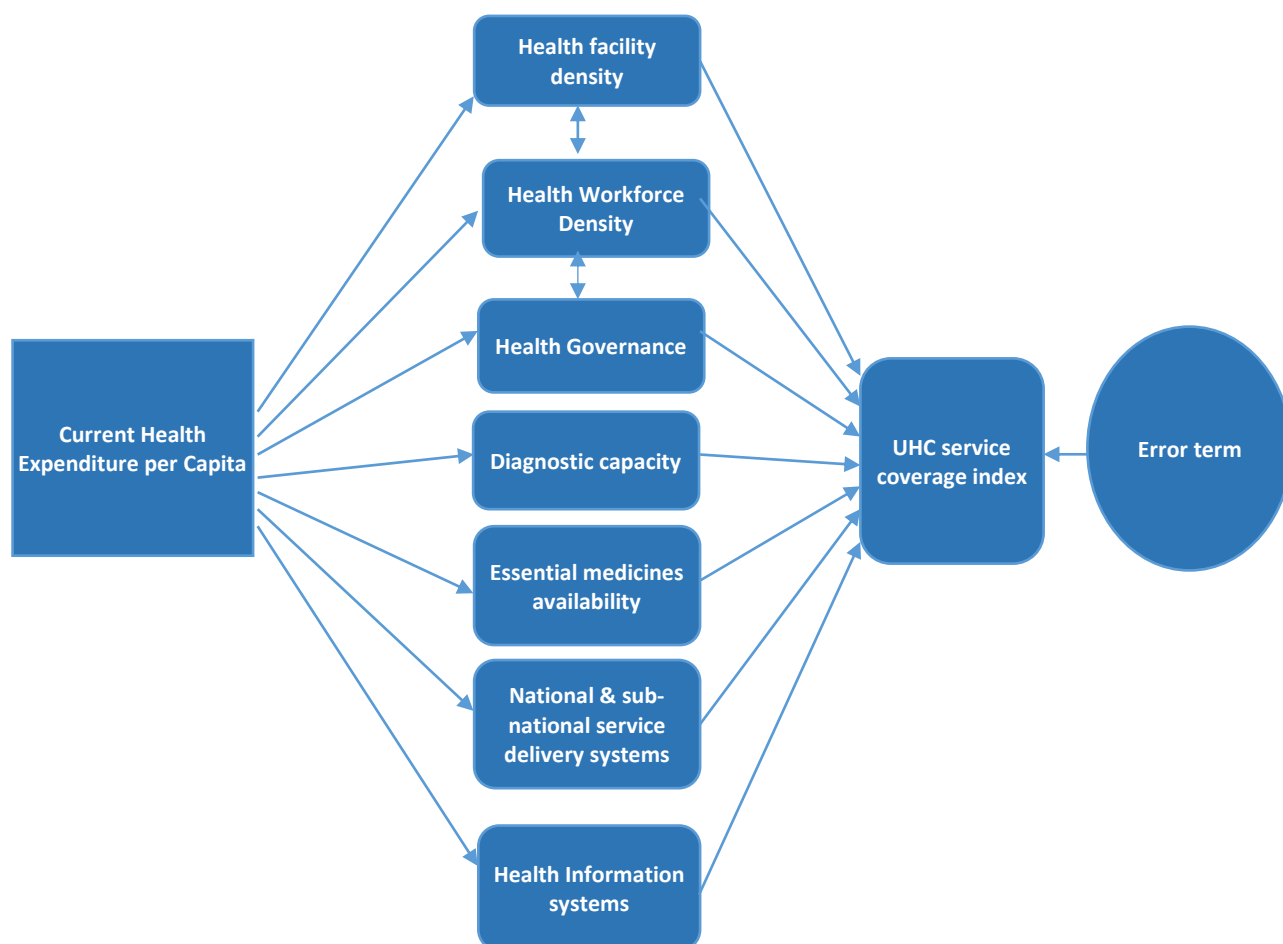
Source: *International Standard Classification of Occupations, ISCO-08 (ILO, 2008)*

In 2016, a WHO study based on 12 SDG tracer indicators and their contribution to the global burden of disease (Scheffler et al., 2018), determined that countries needed about 44.5 doctors, nurses and midwives per 10 000 population to be able to attain the median of the target of the SDG tracer indicators. Compared to the current analysis, an even higher density (about threefold) is required when the contribution of other categories of health workers is taken into consideration. Besides the methodological differences between the previous work (SDG-index) and the current one, the present analysis is based on only 47 countries in the WHO African Region whereas the previous one was based on all countries where data was available. Thus, whereas the current analysis may suffer from sample size limitations, the former also had to deal with considerable heterogeneity in country contexts, especially among high-, middle- and low-income countries across different continents.

## Structural equation model for predicting UHC service coverage index

It was assumed that the levels of health expenditure would have a positive influence on key variables which are direct inputs to health service access and coverage: health workforce density; health facility density; diagnostic readiness (capacity); and essential medicines availability. Thus, although the focus of this analysis was to determine a density threshold for health workers toward UHC, it was deemed imperative to include these other inputs as covariates in the model and be able to have them controlled in the estimation (Pituch et al., 2013).

Conceptual/structural equation model for UHC service coverage score



Source: Authors' construction

The conceptual relationships described were used for empirical testing, based on the available data from 47 countries of the WHO African Region, using a structural equation modelling procedure in STATA version 16. The resultant structural equations were assessed for fitness of the data and then used in a generalized reduced gradient optimization model to determine the HWF density threshold at which the aggregate health workforce density contributes to the attainment of a given level of UHC service coverage index, by controlling for the other covariates.

The estimates are guided rough ones for national-level analysis only. It is not a planning target for countries and in any case, not appropriate for health facility or operational planning. The model explained up to 70% of the UHC service coverage index, leaving some 30% which can be explained by variables not measured in this model. A seemingly sizeable statistical noise from the unobserved variables (especially issues on governance) should be considered a limitation, and efforts must be made to take them into account in future updates when such data become available.

In Table 8, the model shows that a country's current health expenditure per capita has a statistically significant positive relationship with the health workforce density per 10 000 population ( $\beta = 0.033, P=0.003$ ). Thus, a US\$ 1 increase in current health expenditure per capita is associated with 0.033 improvement in the density of the

health workforce per 10 000 population, although current health expenditure per capita also shows a positive influence on the other covariables but not statistically significant. After controlling for the other variables (diagnostic readiness, standardized health facility density and essential medicines readiness), a unit increase in the health workforce density per 10 000 population is statistically significant and positively associated with improvements in the UHC service coverage index ( $\beta = 0.127, P < 0.001$ ). A positive and statistically significant association has been found between the UHC service coverage index and both diagnostic and essential medicines readiness.

### Empirical relationships between the variables

Structural	Coefficient ( $\beta$ )	Std. Err.	z	P-value	95% Confidence interval of $\beta$	
					Lower	Upper
<b>Health workforce density per 10 000 population</b>						
Current health expenditure per capita	0.033	0.011	2.930	0.003	0.011	0.055
Constant	19.731	5.145	3.830	0.000	9.647	29.816
<b>Health facility density per 1000 population</b>						
Current health expenditure per capita	0.00015	0.00008	1.780	0.075	-0.00001	0.00031
Constant	0.329	0.039	8.520	0.000	0.253	0.404
<b>Essential medicines readiness</b>						
Current health expenditure per capita	0.014	0.009	1.620	0.104	-0.003	0.031
Constant	37.726	3.276	11.520	0.000	31.305	44.146
<b>Diagnostic readiness</b>						
Current health expenditure per capita	0.005	0.008	0.620	0.536	-0.011	0.022
Constant	39.296	3.426	11.470	0.000	32.582	46.011
<b>UHC service coverage index (2019)</b>						
Diagnostic readiness	<b>0.243</b>	<b>0.100</b>	<b>2.430</b>	<b>0.015</b>	<b>0.047</b>	<b>0.438</b>
Health workforce density per 10 000 population	<b>0.127</b>	<b>0.033</b>	<b>3.870</b>	<b>0.000</b>	<b>0.063</b>	<b>0.192</b>
Health facility density per 1000 population	2.235	4.694	0.480	0.634	-6.965	11.435
Essential medicines readiness	0.053	0.119	0.440	0.658	-0.180	0.286
Constant	39.762	5.587	7.120	0.000	28.811	50.714

### Box: Structural equation for predicting UHC service coverage index in the WHO African Region

$$\text{UHC service coverage index} = 39.762 + (\text{Diagnostic Readiness} \times 0.243) + (\text{Health Workforce Density per 10 000 population} \times 0.127) + (\text{standardized health facility density} \times 2.235) + (\text{Essential Medicines Readiness} \times 0.053) \quad (6).$$

To assess the validity of the prediction equation, it was used to predict the UHC service coverage index for all 47 Member States of the WHO African Region, yielding an average deviation of 6%. The model predicts an average UHC service coverage index of 56.62 for the African Region as against the actual value in the UHC monitoring report of 2019, which was 56.44, thus showing a mean absolute deviation of 0.183, which represents only 0.32% of the value reported in the 2019 UHC monitoring report. However, the model is sensitive to inconsistent, outdated or zero data for the input variables.

## Annex 2: Health Workforce Classification Mapping

Occupation	Code	Definition	Notes		
			Examples of occupations included here	Excluded occupations - classified elsewhere	Additional comments
<b>Generalist medical practitioners</b>	2211	<b>Generalist medical practitioners</b> (physicians) apply the principles and procedures of modern medicine in preventing, diagnosing, caring for and treating illness, disease and injury in humans and the maintenance of general health. They may supervise the implementation of care and treatment plans by other health care providers and conduct medical education and research activities. They do not limit their practice to certain disease categories or methods of treatment and may assume responsibility for the provision of continuing and comprehensive medical care.	Medical doctor (general), general practitioner, family medical practitioner, primary health care physician, district medical doctor-therapist, resident medical officer specializing in general practice	Specialist physician-2212 Paediatrician-2212 Surgeon-2212 Psychiatrist-2212 Traditional medicine practitioner-2230 Paramedical practitioner-2240	Occupations included in this category require completion of a university-level degree in basic medical education, plus postgraduate clinical training or equivalent for competent performance. Medical trainees who are non-university graduates should <u>not</u> be included here. Medical interns who have completed their university education in basic medical education and are undertaking postgraduate clinical training are included here. Although in some countries 'general practice' and 'family medicine' may be considered as medical specializations, these occupations should always be classified here.
<b>Specialist medical practitioners</b>	2212	<b>Specialist medical practitioners</b> (physicians) apply the principles and procedures of modern medicine in preventing, diagnosing, caring for and treating illness, disease and injury in humans using specialized testing, diagnostic, medical, surgical, physical and psychological techniques. They may supervise the implementation of care and treatment plans by other health care providers. They specialize in certain disease categories, types of patient or methods of treatment, and may conduct medical education and research activities in their chosen areas of specialization.	Specialist physician (internal medicine), Surgeon, anaesthetist, cardiologist, emergency medicine specialist, ophthalmologist, obstetrician, gynaecologist, paediatrician, pathologist, preventive medicine specialist, psychiatrist, radiologist, resident medical officer in specialist training	General medical practitioner-2211 Dental practitioner-2261 Dental surgeon-2261 Physiotherapist-2264 Psychologist-2634	Occupations included in this category require completion of a university-level degree in basic medical education plus postgraduate clinical training in a medical specialization (except general practice) or equivalent. Medical trainees who are non-university graduates should <u>not</u> be included here. Resident medical officers training as specialist practitioners (except general practice) are included here. Although in some countries 'stomatology' may be considered as a medical specialization, stomatologists should be included under 'Dentists'-2261.
<b>Nursing professionals</b>	2221	<b>Nursing professionals</b> plan, manage, provide and evaluate nursing care services for persons in need of such care due to effects of illness, injury, or other physical or mental impairment, or potential risks for health. They work autonomously or in teams with medical doctors and other health workers. They may supervise the implementation of nursing care plans, and conduct nursing education activities.	Professional nurse, specialist nurse, nurse practitioner, clinical nurse, general nurse-midwife, public health nurse, nurse anaesthetist	Professional midwife-2222 Associate professional nurse-3221 Associate professional midwife-3222 Paramedical practitioner-2240	Occupations included in this category normally require completion of tertiary-level education in theoretical and practical nursing. Nursing professionals who spend most of their working time in maternal and newborn health care services should be included under 'Midwifery professionals'-2222.



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Occupation	Code	Definition	Notes		
			Examples of occupations included here	Excluded occupations - classified elsewhere	Additional comments
<b>Nursing associate professionals</b>	3221	<b>Nursing associate professionals</b> provide basic nursing care for people who need such care due to effects of ageing, illness, injury, or other physical or mental impairment. They implement care, treatment and referral plans established by medical, nursing and other health professionals.	Associate professional nurse, assistant nurse, licensed practical nurse, enrolled nurse	Professional nurse–2221 Specialist nurse–2221 Associate professional midwife–3222 Community nurse attendant–3253 Nursing aide (hospital or clinic)–5321 Nursing aide (home)–5322	Occupations included in this category normally require formal training in nursing services. Associate professional nurses who spend most of their working time in maternal and newborn health care services should be included under 'Associate professional midwives'–2223.
<b>Midwifery professionals</b>	2222	<b>Midwifery professionals</b> plan, manage, provide and evaluate midwifery care services before, during and after pregnancy and childbirth. They provide delivery care for reducing health risks to women and newborns, working autonomously or in teams with other health care providers.	Professional midwife	Nursing aide–5321 Associate professional nurse–3231 Associate professional midwife–3232	Occupations included in this category normally require completion of tertiary-level education in theoretical and practical midwifery.
<b>Midwifery associate professionals</b>	3222	<b>Midwifery associate professionals</b> provide basic health care and advise before, during and after pregnancy and childbirth. They implement care, treatment and referral plans to reduce health risks to women and newborns as established by medical, midwifery and other health professionals.	Associate professional midwife, Assistant midwife	Professional midwife–2222 Associate professional nurse–3221 Midwifery attendant–5321	Occupations included in this category normally require formal training in midwifery services. Midwifery attendants with little or no formal training should be included under 'Health care assistants'–5321.
<b>Paramedical practitioners</b>	2240	<b>Paramedical practitioners</b> (advanced practice clinicians) provide advisory, diagnostic, curative and preventive medical services in a variety of settings. They work autonomously or with limited supervision from medical doctors and apply advanced clinical procedures for treating and preventing diseases, injuries, and other physical or mental impairments common to specific communities.	Clinical officer, surgical technician, physician assistant, primary care paramedic, advanced care paramedic, feldsher	Emergency paramedic–3258 Medical assistant–3256 General medical practitioner–2211 Surgeon–2212	Occupations included in this category normally require completion of tertiary-level training in theoretical and practical medical services. Workers providing services limited to emergency treatment and ambulance practice should be included under 'Ambulance workers'–3258.
<b>Dentists</b>	2261	<b>Dentists</b> apply the principles and procedures of modern dentistry in diagnosing, treating and preventing diseases, injuries and abnormalities of the teeth, mouth, jaws and associated tissues. They use a broad range of specialized diagnostic, surgical and other techniques to promote and restore oral health.	Dentist, dental practitioner, dental surgeon, oral and maxillofacial surgeon, endodontist, orthodontist, paedodontist, periodontist, prosthodontist, stomatologist	Dental prosthetic technician–3214 Dental assistant–3251 Dental hygienist–3251	Occupations included in this category normally require completion of university-level training in theoretical and practical dentistry or related field. Although in some countries 'stomatology' and 'dental, oral and maxillofacial surgery' may be considered as medical specializations, occupations in these fields should always be classified here.

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Occupation	Code	Definition	Notes		
			Examples of occupations included here	Excluded occupations - classified elsewhere	Additional comments
<b>Dental assistants and therapists</b>	3251	<b>Dental assistants and therapists</b> provide basic dental care services for the prevention and treatment of diseases and disorders of the teeth and mouth, as per care plans and procedures established by a dentist or other oral health professional.	Dental assistant, dental hygienist, dental therapist	Dental aide–5329 Dental mechanic–3214 Dental prosthetist–3214 Dental technician–3214 Dentist–2261	Occupations included in this category normally require formal training in dental hygiene, dental-assisting or related field.
<b>Pharmacists</b>	2262	<b>Pharmacists</b> store, preserve, compound, test and dispense medicinal products. They counsel on the proper use and adverse effects of drugs and medicines following prescriptions issued by medical doctors and other health professionals. They contribute to researching, preparing, prescribing and monitoring medicinal therapies for optimizing human health.	Hospital pharmacist, industrial pharmacist, retail pharmacist, dispensing chemist	Pharmacologist–2131 Pharmaceutical technician–3213	Occupations included in this category normally require completion of university-level training in theoretical and practical pharmacy, pharmaceutical chemistry or a related field. Pharmacologists and related professionals who study living organisms are <u>not</u> included here (classified under Life science professionals).
<b>Pharmaceutical technicians and assistants</b>	3213	<b>Pharmaceutical technicians and assistants</b> perform routine tasks associated with preparing and dispensing medicinal products under the supervision of a pharmacist or other health professional.	Pharmaceutical technician, Pharmacy assistant	Pharmacist–2262 Pharmacy aide–5329 Pharmacology technician–3141	Occupations included in this category normally require basic medical and pharmaceutical knowledge obtained through formal training. Pharmacology technicians and related associate professionals who work with living organisms are <u>not</u> included here (classified under life science technicians).
<b>Environmental and occupational health and hygiene workers</b>	2263, 3257	<b>Environmental and occupational health and hygiene workers</b> plan, assess and investigate the implementation of programmes and regulations to monitor and control environmental factors that can potentially affect human health, to ensure safe and healthy working conditions, and the safety of processes for the production of goods and services.	Environmental health officer, occupational health and safety adviser, occupational health and safety inspector, occupational hygienist, radiation protection adviser, sanitarian, health inspector, food sanitation and safety inspector	Specialist medical practitioner (public health)–2212 Specialist nurse (public health)–2221 Occupational therapist–2269, Environmental protection professional–2133	Occupations included in this category normally require formal training in environmental public health, occupational health and safety, sanitary sciences, or a related field. Environmental protection workers who study and assess the effects on the environment of human activity are <u>not</u> included here (classified under life science professionals).

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Occupation	Code	Definition	Notes		
			Examples of occupations included here	Excluded occupations - classified elsewhere	Additional comments
<b>Physiotherapists and physiotherapy assistants</b>	2264, 3255	<b>Physiotherapists and physiotherapy assistants</b> provide physical therapeutic treatments to patients in circumstances where functional movement is threatened by injury, disease or impairment. They may apply movement, ultrasound, heating, laser and other techniques.	Physiotherapist, paediatric physical therapist, orthopaedic physical therapist, physiotherapist assistant, physical rehabilitation technician, massage therapist, electrotherapist, acupressure therapist, shiatsu therapist, hydrotherapist	Occupational therapist–2269 Osteopath–3259 Chiropractor–3259 Podiatrist–2269	Occupations included in this category normally require formal training in physical rehabilitation therapy or a related field.
<b>Optometrists and opticians</b>	2267, 3254	<b>Optometrists and opticians</b> provide primary eye health and vision care services. Optometrists and ophthalmic opticians provide diagnosis management and treatment services for disorders of the eyes and visual system. Dispensing opticians design, fit and dispense optical lenses for the correction of reduced visual acuity.	Optometrist, optician, orthoptist	Ophthalmologist–2212	Occupations included in this category normally require formal training in optometry, orthoptics, opticianry or a related field.
<b>Medical imaging and therapeutic equipment operators</b>	3211	<b>Medical imaging and therapeutic equipment technicians</b> test and operate radiographic, ultrasound and other medical imaging equipment to produce images of body structures for the diagnosis and treatment of injury, disease and other impairments. They may administer radiation treatments to patients under the supervision of a radiologist or other health professional.	Medical imaging technician, diagnostic medical radiographer, medical radiation therapist, magnetic resonance imaging technologist, nuclear medicine technologist, sonographer, mammographer	Radiologist–2212	Occupations included in this category normally require formal training in medical technology, radiology, sonography, nuclear medical technology, or a related field.
<b>Medical and pathology laboratory technicians</b>	3212	<b>Medical and pathology laboratory technicians</b> perform clinical tests on specimens of bodily fluids and tissues to get information about the health of a patient or cause of death.	Medical laboratory technician, medical laboratory assistant, cytology technician, blood bank technician, pathology technician	Pathologist–2212	Occupations included in this category normally require formal training in biomedical science, medical technology, or a related field. Technicians conducting laboratory tests on specimens from animals are <u>not</u> included here (classified under veterinary technicians).

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Occupation	Code	Definition	Notes		
			Examples of occupations included here	Excluded occupations - classified elsewhere	Additional comments
<b>Medical and dental prosthetic technicians</b>	3214	<b>Medical and dental prosthetic technicians</b> design, fit, service and repair medical and dental devices and appliances following prescriptions or instructions established by a health professional. They may service a wide range of support instruments to correct physical medical or dental problems such as neck braces, orthopaedic splints, artificial limbs, hearing aids, arch supports, dentures, and dental crowns and bridges.	Medical appliance technician, prosthetist, orthotist, prosthetic technician, orthotic technician, dental technician, denturist	Dental assistant–3251 Dispensing optician–3254	Occupations included in this category normally require basic medical, dental and anatomical knowledge obtained through formal training. Technicians who construct and repair precision medical and surgical instruments based on engineering knowledge alone are <u>not</u> included here (classified under science and engineering associate professionals).
<b>Community health workers</b>	3253	<b>Community health workers</b> provide health education, referral and follow up, case management, and basic preventive health care and home visiting services to specific communities. They provide support and assistance to individuals and families in navigating the health and social services system.	Community health worker, community health aide, community health promoter, village health worker	Nursing aide–5322 Home care aide–5322 Village healer–3230	Occupations included in this category normally require formal or informal training recognized by the health and social services authorities. Providers of routine personal care services, self-defined health care providers and traditional medicine practitioners are <u>not</u> included here.
<b>Medical assistants</b>	3256	<b>Medical assistants</b> perform basic clinical and administrative tasks to support patient care under the direct supervision of a medical practitioner or other health professional.	Medical assistant, clinical assistant, ophthalmic assistant	Clinical officer–2240 Physician assistant–2240 Dental assistant–3251 Physiotherapy assistant–3255 Medical prosthetic technician–3214 Medical imaging assistant–5321	Occupations included in this category normally require formal training in health services provision. Clinical care providers with advanced training and skills to provide independent medical diagnostic and treatment services should be classified under 'Paramedical practitioners'-2240.

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Occupation	Code	Definition	Notes		
			Examples of occupations included here	Excluded occupations - classified elsewhere	Additional comments
<b>Traditional and complementary medicine practitioners</b>	2230, 3230	<b>Traditional and complementary medicine practitioners</b> apply procedures and practices based on the theories, beliefs and experiences indigenous to different cultures, used in the maintenance of health and in the prevention or treatment of physical and mental illnesses.	Acupuncturist, Ayurvedic practitioner, Unani practitioner, Chinese herbal medicine practitioner, homeopath, naturopath, bonesetter, herbalist, witch doctor, village healer, scraping and cupping therapist	Acupressure therapist–3255 Shiatsu therapist–3255 Hydrotherapist–3255 Chiropractor–3259 Osteopath–3259	Occupations included in this category normally require knowledge and skills acquired from formal education, or informally through the traditions and practices of the communities where they originated. Faith healers who treat human ailments through spiritual therapies, without using herbal preparations or other physical interventions, are <u>not</u> included here. Occupations that rely on traditional forms of massage and the application of pressure, such as acupressure and shiatsu therapists, are classified in 'Physiotherapy technicians and assistants'-3255.
<b>Other health service providers</b>		This category may include a wide range of occupations connected with health service provision.	Ambulance paramedic–3258 Emergency medical technician–3258 Dieticians and nutritionists–2265 Audiologists and speech therapists–2266 Podiatrist–2269 Occupational therapist–2269 Chiropractor–3259 Osteopath–3259 Psychologist–2634 Social workers and counsellors–2635		Occupations included in this category normally require formal training in a health or social service-related field.
<b>Health care assistants and other personal care workers in health services</b>	5321, 5322, 5329	<b>Personal care workers</b> perform routine patient care services as per care plans, practices and procedures established by a health professional.	Hospital orderly, nursing aide, patient care assistant, dental aide, midwifery attendant, psychiatric aide, medical imaging assistant, home care aide, pharmacy aide, dental aide, sterilization aide, faith healer	Nurse (associate professional)–3221 Nurse (professional)–2221 Community health worker–3253	Occupations included in this category generally do not require extensive health care knowledge or training. Personal care workers may work in a variety of settings including private homes as well as health facilities (hospitals, medical and dental practice facilities, rehabilitation centres, and other types of residential facilities with or without on-site nursing care services).

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Occupation	Code	Definition	Notes		
			Examples of occupations included here	Excluded occupations - classified elsewhere	Additional comments
<b>Other science professionals and technicians</b>		This category may include a wide range of occupations connected with physical and life sciences research and applications to solve human health problems.	Pharmacologist–2131 Biologist–2131 Biotechnologist–2131 Cell geneticist–2131 Environmental protection professional–2133 Environmental research scientist–2133 Medical physicist–2111 Bacteriology technician–3141 Pharmacology technician–3141		Occupations included here normally require formal training in a physical or life science-related field.
<b>Health service managers</b>	1342	<b>Health service managers</b> plan, coordinate and supervise the provision of clinical, personal care and community health care services.	Health facility administrator, medical nursing home administrator, clinical manager, director of nursing care, hospital matron, community care coordinator, chief public health officer	Aged care service manager–1343 Senior government official–1112	The main tasks and duties for jobs in this occupational category include guiding and directing the activities of organizations, departments and other workers. Education and training requirements may vary depending on the position and national context — likely including some combination of formal education, on-the-job training and work experience.
<b>Medical records and health information technicians</b>	3252	<b>Medical records and health information technicians</b> assess, manage and implement health records processing, storage and retrieval systems in medical facilities and other health care settings to meet the legal, professional, ethical and administrative records-keeping requirements of health services delivery.	Medical records clerk, medical records technician, health information system technician, health information clerk, medical records analyst, clinical coder, disease registry technician	Medical secretary–3344 Data entry clerk–4132 Filing and copying clerk–4415	Occupations included in this category normally require knowledge of medical terminology, legal aspects of health information, health data standards, and computer- or paper-based data management as obtained through formal education and/or on-the-job training. Clerks who perform general secretarial or clerical duties are <u>not</u> included here (classified under clerical support workers).

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Occupation	Code	Definition	Notes		
			Examples of occupations included here	Excluded occupations - classified elsewhere	Additional comments
<b>Other health management and support workers</b>		This category may include a wide range of workers performing a variety of administrative, clerical, and other tasks and duties to support the provision of health services and functioning of health systems.	Health policy analyst-2422 Government licensing official-3354 Aged care service manager-1343 Staff training officer-2424 Medical secretary-3344 Computer technician-3513 Data entry clerk-4132 Filing and copying clerk-4415 Receptionist-4226 Building caretaker-5153 Cook-5120 Ambulance driver-8322		



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