THE REPUBLIC OF UGANDA

ANALYSIS OF THE HEALTH LABOUR MARKET OF UGANDA

FINDINGS FROM A DESCRIPTIVE AND PREDICTIVE ANALYSIS 2023

World Health Organization

Uganda

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Foreword

The journey towards achieving universal health coverage (UHC) in Uganda places a strong emphasis on the importance of the health workforce. The National Development Plan III (NDPIII) and the Health Sector Strategic Plan II (HSSPII) serve as the primary policy frameworks guiding the development of Human Resources for Health in the country. The objective of the NDPIII's Human Capital Development Program is to enhance the productivity of the population, leading to increased competitiveness and an improved quality of life for all Ugandans. Similarly, the HSSPII aims to expedite progress towards UHC while also improving the overall health, safety, and management of the population by the year 2025. To achieve the goals outlined in the NDPIII and HSSPII, it is crucial to have a high-performing health workforce that is well-equipped to address both current and future healthcare needs.

In line with these objectives, the Uganda Ten-Year Human Resources for Health Strategic Plan (2020-2030) was developed. This plan aims to ensure that individuals and communities in Uganda have equitable access to quality health services delivered by a competent, motivated, and supported health workforce. However, Uganda faces ongoing challenges related to the supply, distribution, competency, motivation, and performance of the health workforce.

Taking a health labor market approach helps to gain a deeper understanding of the context and factors influencing these challenges, thereby informing policy options to address them. Through a comprehensive analysis of Uganda's health labor market, this report provides an assessment of the current status of the health workforce in terms of stock, distribution, flows, and demand. It also offers predictions on future requirements for achieving UHC goals. The report identifies necessary investments, policy reforms, and regulatory changes required to overcome the challenges faced by the health workforce in Uganda.

Given the timing of this report, its recommendations will play a crucial role in guiding actions to ensure that the health workforce is at the forefront of efforts to build back better and ensure equitable access to essential services in alignment with UHC goals. These recommendations will significantly enhance the economic, health, and social impacts of investments in the health and care workforce.

The health sector is fully committed to utilizing the information and policy implications provided in this report to make critical decisions that guarantee all Ugandans receive the healthcare they need. Therefore, I urge national and global stakeholders to use the findings to inform HRH development interventions and support the implementation of the recommendations, recognizing its significance in advancing the health agenda in Uganda.

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Acronyms

AHSPR	Annual Health Sector Performance Report
BSc	Bachelor of Science
DHIS	District Health Information System
GDP	Gross Domestic Product
GEI	Geographical Equity Index
HC II	Health Centre II
HC III	Health Centre III
HC IV	Health Centre IV
HLM	Health Labour Market
HLMA	Health Labour Market Analysis
HRH	Human Resources for Health
HSC	Health Service Commission
ISCO	International Standard Classification of Occupations
MBChB	Bachelor of Medicine and Bachelor of Surgery
MoE	Ministry of Education
MoFPED	Ministry of Finance, Planning and Economic Development
MoGLSD	Ministry of Gender, Labour, and Social Development
MOH	Ministry of Health
MoLG	Ministry of Local Government
MoPS	Ministry of Public Service
MPH	Master of Public Health
NHWA	National Health Workforce Accounts
NPA	National Planning Authority
PSC	Public Service Commission
SDG	Sustainable Development Goals
UBOS	Uganda Bureau of Statistics
UHC	Universal Health Coverage
VHTs	Village Health Teams
WHO	World Health Organization

Executive Summary

INTRODUCTION

The Government of Uganda is committed to strengthening the health system to realize universal health coverage by 2030 based on a primary health care approach. It plans to achieve this by strengthening the governance and management of the health system; increasing access to interventions for prevention and control of common diseases and health conditions; disease surveillance, preparedness and response to epidemics and disasters; and ensuring access to quality and safe medicines, vaccines, and technologies are key strategies for achieving the sector objectives. Accordingly in recent past years, an increase in the health sector budget, investments in health infrastructure, and increments in remunerations of health workers have been effected by the government to strengthen the health system.

The attainment of Universal Health Coverage requires an adequate number of qualified, skilled, and motivated health workers which are equitably distributed in the country. A sustainable supply of health labour from health training institutions is equally needed. However, the contemporary information on the health workforce dynamics remains scanty; specifically, the political economy, education, supply, and the current and future demand of health workers based on the health needs of the population.

The Ministry of Health undertook the Health Labour Market Analysis (HLMA), with technical and financial support from WHO, to better understand the human resources for health (HRH) dynamics. The aim of the Uganda Health Labour Market Analysis (HLMA) is to conduct in-depth analysis of the relationship between political economy, education, supply, demand, and the need of health workers in Uganda.

This document presents the major findings of the Health Labour Market Analysis. It provides contextual evidence, for guiding policy actions such as strategic investments in HRH needed for the attainment of Universal Health Coverage in Uganda.

IMPLEMENTATION APPROACH

A phased multi-method design was applied in the conduct of the Uganda HLMA using the Health Labour Market framework to guide the process. The approaches applied included identification of key stakeholders applying a snowballing sampling technique, review of national documents, data extraction from relevant information systems, stakeholder consultations through key informant interviews and focus group discussions, triangulation of information, and descriptive and predictive analysis.

KEY FINDINGS

The health sector contribution to the economy averaged 3.3% between 2016 and 2021 with the contribution increasing per year since 2019. The contribution of the health sector to overall employment in the economy has been on a growth trajectory, increasing from 4.6% in 2010 to 5.5% in 2020. There has been a steady increase in the public health sector wage bill in Uganda in relation to the health sector budgets from 2018/19 to 2022/23 financial years. In a period of 7 years the wage bill has increased by 15% (from 9% to 24%). On average, district governments spent in the range of 11% to 18% in HRH in 2022.

In 2022, Uganda had a total of 210 health training institutions located in 66 districts. The private for-profit owned health training institutions were in majority (n=133), representing 63.3%, compared to the government [22.4% (n=47)] and the private not for profit [14.3% (n=30)] owned health training institutions.

The health workforce stock and density improved by 76% between 2005 and 2022, and the density is 58% of the international benchmark of 44.5 per 10 000 population. Uganda had a density of 25.9 doctors, nurses, and midwives per 10 000 population in 2022. The highest growth rate was observed for midwives (211%), followed by nurses (184%), and medical doctors (51%). In relation to sector of employment, majority of nursing professionals (74%), and midwife-

ry professionals (64%) were employed in the public sector, compared to 26%, and 36% employed in the private sector, respectively. About 61% of medical doctors and specialists were employed in the private sector, whilst 39% were employed in the public sector.

Uganda has a young health workforce with most health workers aged below 45 years. Most of the health workers are in the age range of 25 to 34 years followed by those in the age range of between 35 and 44 years.

Estimated need for health workers in Uganda in 2022 was 194,271 compared to an overall supply of 154,016 and this translates to the 79% of the need for health workers being available. Based on the current trend, by 2027, the need will be 224,669 health workers with the supply being 226,312 with 100% of needed health workers being locally available. By 2023, 96% of the health workers will be available to adequately meet the health needs of the population.

The potential financial space for the health workforce, which is a combination of public and private sector contributions, was estimated to be USD 688 million in 2023 but could increase by 21% to US$ 1.04 billion by 2030 assuming the macroeconomic outlook remains favourable.

Estimated wage bill for employing all stock of health workers in 2023 based on the public salary structure is about USD 835 million and this is projected to rise to USD 1.34 billion by 2032. Funds needed to recruit health workers based on the populations' health was USD 1.14 billion and USD 1.17 billion for 2022 and 2023 respectively, and this amount would increase to USD 1.75 billion by 2032.

SUMMARY OF POLICY AND PRACTICE RECOMMENDATIONS

1. **Plan, train, and absorb HRH informed by the health needs of the population.** Strengthen multi-sectoral health workforce governance, stewardship, and financing to ensure planning for health workforce is informed by the populations health needs, resources are channelled to training priority cadres for the health system and health workers are absorbed into the labour market to ensure quality service delivery.

2. **Strengthen the Integrated HRH Information system** to ensure the availability of health workforce data, and functionality and interoperability of HRH information systems at various ministries, institutions, and agencies, including the health professional councils.

3. **Strengthen regulation of health professionals and practice** Enhance the professional regulatory bodies to regulate health workers across public and private sectors, and private service delivery sector, and

4. **Formalise Migration of health workers through signing bilateral agreements** Sign and implement health worker mobility bilateral agreements with countries benefiting from the migration of Uganda's health workforce with the aim of strengthening Uganda's health system to achieve its SDG targets.

SECTION 01
Introduction

1.1. CONTEXT

1.1.1. Geographic and Socio-economic information

Uganda is a land linked country about 800 kilometers inland from the Indian Ocean and lies across the equator between 10 29' South and 40 12' North latitude, 290 34' East and 350 0' East longitude. Located in East Africa, it is bordered by Kenya in the East; South Sudan in the North; Democratic Republic of Congo in the West; Tanzania in the South; and Rwanda in Southwest. The country covers a total area of 241,551 square kilometers, of which 200,523 square kilometers[1] is land and about 41,027 square kilometers is water. The country currently has 135 districts, including 11 Cities grouped into 15 non statutory sub regions.

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1   Uganda Bureau of Statistics 2016, The National Population and Housing Census 2014 – Main Report, Kampala, Uganda. https://www.ubos.org/wp-content/uploads/publications/03_20182014_National_Census_Main_Report.pdf

BOX 1

SOUTH SUDAN

D.R. CONGO

KENYA

TANZANIA

RWANDA
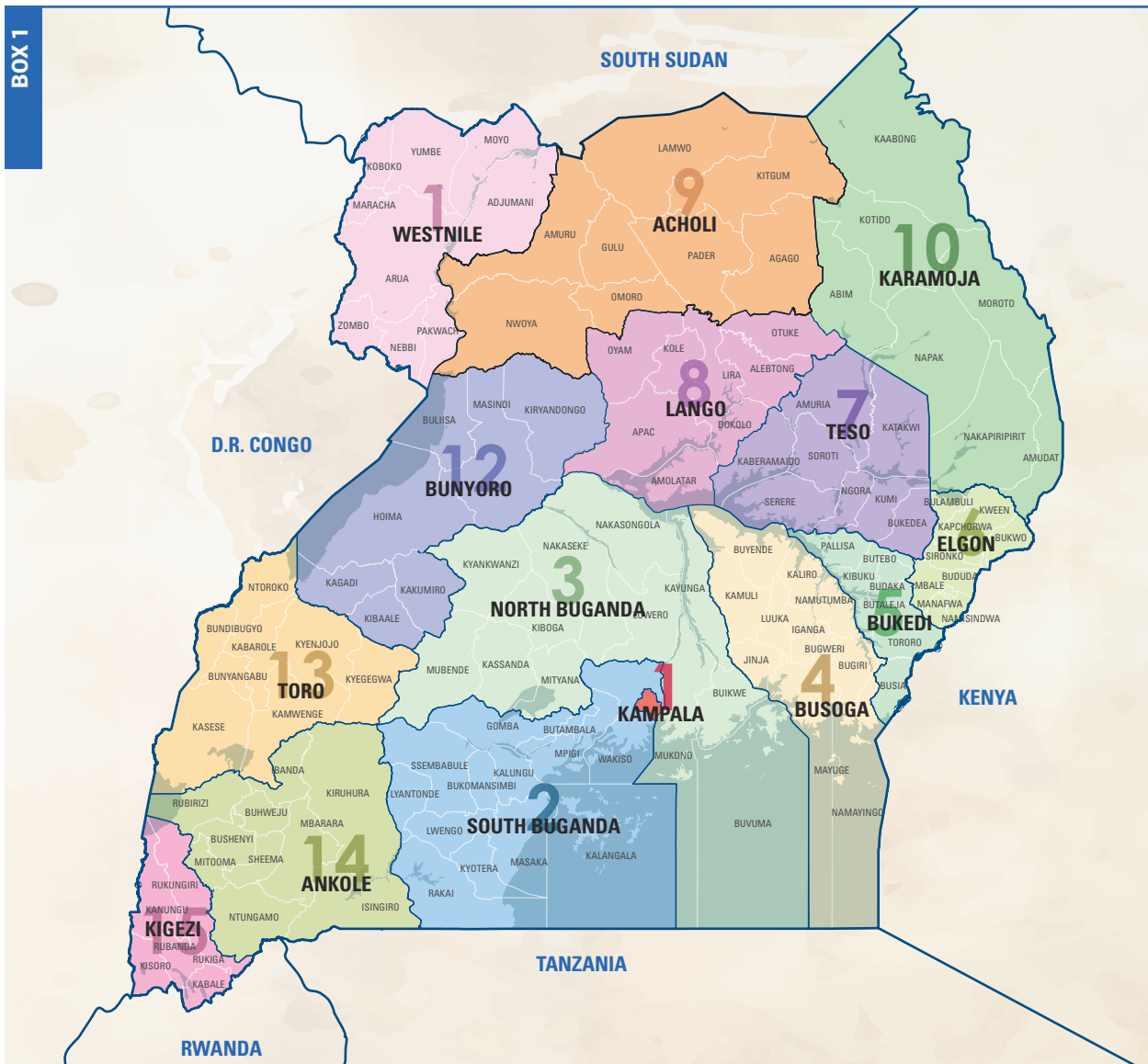
15 SUB-REGIONS OF UGANDA WITH THE DISTRICTS AND CITIES

1. **KAMPALA:** Kampala

2. **BUGANDA SOUTH:** Butambala, Gomba, Mpigi, Bukomansimbi, Kalangala, Kalungu, Kyotera, Lwengo, Lyantonde, Masaka, Rakai, Sembabule, Wakiso and Masaka City.

3. **BUGANDA NORTH:** Buikwe, Buvuma, Kassanda, Kayunga, Kiboga, Kyankwanzi, Luwero, Mityana, Mubende, Mukono, Nakaseke and Nakasongola.

4. **BUSOGA:** Bugiri, Bugweri, Namutumba, Buyende, Iganga, Jinja, Kaliro, Kamuli, Luuka, Mayuge, and Jinja City.

5. **BUKEDI:** Budaka, Butaleja, Butebo, Kibuku, Pallisa, Tororo, Busia and Namayingo.

6. **ELGON:** Bududa, Bulambuli, Kapchorwa, Kween, Manafwa, Mbale, Namisindwa, Sironko, Bukwo and Mbale City.

7. **TESO:** Amuria, Bukedea, Kaberamaido, Kalaki, Kapelebyong, Katakwi, Kumi, Ngora, Serere, Soroti and Soroti City.

8. **LANGO:** Alebtong, Amolatar, Dokolo, Lira, Otuke, Apac, Kole, Kwania, Oyam, and Lira city

9. **ACHOLI:** Agago, Amuru, Gulu, Lamwo, Pader, Kitgum, Nwoya, Omoro and Gulu City.

10. **KARAMOJA:** Abim, Amudat, Kaabong, Karenga, Kotido, Moroto, Nabilatuk, Nakapiripirit and Napak.

11. **WEST NILE:** Adjumani, Arua, Koboko, Madi-Okollo, Maracha, Moyo, Nebbi, Obongi, Pakwach, Yumbe, Zombo and Arua City.

12. **BUNYORO:** Buliisa, Hoima, Kagadi, Kakumiro, Kibaale, Kiryandongo, Masindi, Kikuube and Hoima City.

13. **TOORO:** Bundibugyo, Bunyangabu, Kabarole, Kasese, Kitagwenda, Ntoroko, Kyenjojo, Kamwenge, Kyegegwa and Fort Portal City.

14. **ANKOLE:** Buhweju, Bushenyi, Ibanda, Isingiro, Kazo, Kiruhura, Mbarara, Mitooma, Ntungamo, Rubirizi, Rwampara, Sheema and Mbarara City.

15. **KIGEZI:** Kabale, Kanungu, Kisoro, Rubanda, Rukiga, and Rukungiri.

1.1.2. Population Size and Demographics

According to the National Population and Housing Census of 2014, Uganda's total population was 34.6 million persons, with the life expectancy at birth rising from 48 years to 63 years over the period 1991 to 2014[2]. Uganda's population projections shown in **Figure 1** indicate an increase in population to 55.4 million persons by 2030 growing at a rate of 3.4%.
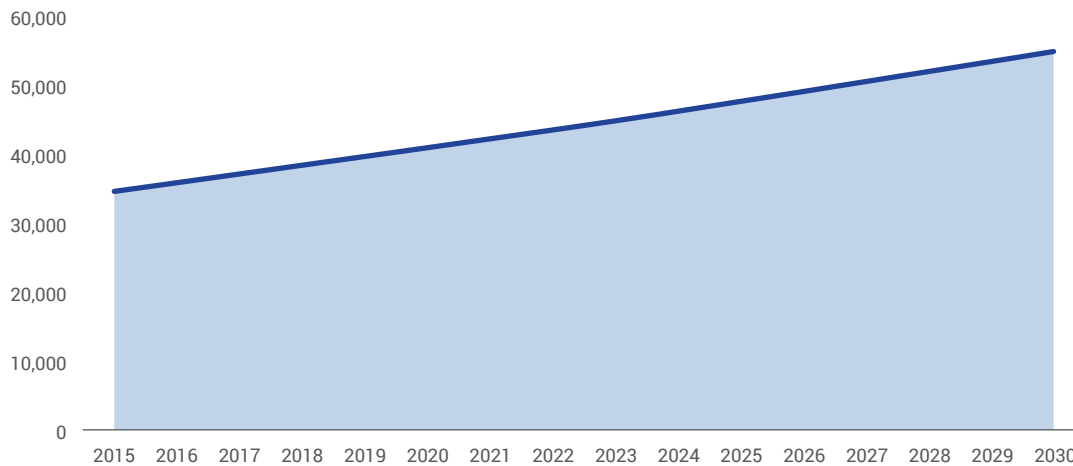
Figure 1: Uganda's population projection from 2020 to 2030.

Source*: UBOS-Revised Subcounty Population Projections 2015-2030 for 146 Districts[3]*

According to the 2016 Uganda Demographic Health Survey Report, forty one percent (41%) of the total population were women of reproductive age (15-49) years. Figure 5 presents the distribution of children who are under-five years (18%), older children from 5 to 9 years (17%), adolescents who are 10 to 19 years (24%), adults aged 20 to 64 years (37%) and adults aged 65 years and above (3%).
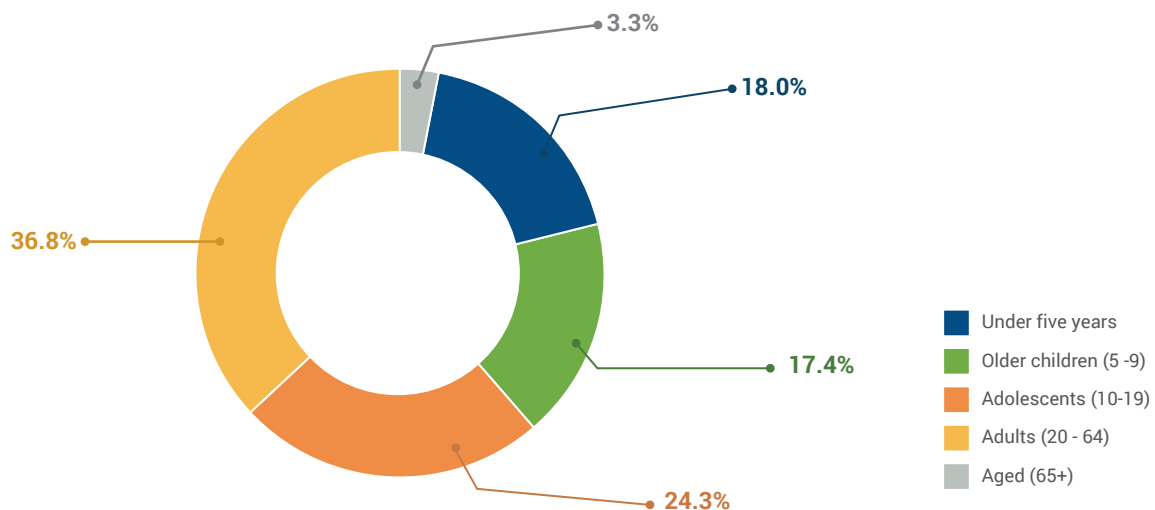
Figure 2: Population distribution by cohorts.

Source*: Uganda Demographic Health Survey 2016[4]*

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2   Uganda Bureau of Statistics 2016, The National Population and Housing Census 2014 – Main Report, Kampala, Uganda. https://www.ubos.org/wp-content/uploads/publications/03_20182014_National_Census_Main_Report.pdf
3   https://www.ubos.org/wp-content/uploads/statistics/Revised_Subcounty_population_2015_2030_146_Districts.xlsx
4   Uganda Demographic Health Survey 2016. https://dhsprogram.com/pubs/pdf/FR333/FR333.pdf

There has been a dominance in the percentage of females (51%) in Uganda's total population for years 2014 – 2021. However, Uganda's population projection estimates by sex indicate that from 2020 to 2030, there will be an equilibrium in the proportion of females and males at 50% whereas population distribution by residence has been projected to be constant at 37% for rural and 63% for urban from (2015 to 2026) and a slight change is expected to occur from 2027 to 2030 at 38% rural and 62% urban.[5]

1.1.3. Health status

The average life expectancy at birth has increased from 48 to 63 years between 1991 and 2014. There are also concomitant reductions in the under 5 mortality, infant mortality, and neonatal mortality over the last two decades 2006 to 2022: Under 5 mortality 126 to 52 deaths per 1000 live births, infant mortality 71 to 36 per 1000 live births, and neonatal mortality 27 to 22 per 1000 live births. Maternal mortality rates have equally reduced over the last decades, 1988 to 2022, from 506 to 189 maternal deaths per 100,000 live births.

The leading causes of all deaths in Uganda, are newborn diseases accounted for 10.3% followed by malaria (7.4%), pneumonia (5.3%), and anemia (3.9%)[6]. Prematurity was the leading cause of infant fatalities, accounting for 29.5%, followed by neonatal sepsis within the first 7 days at 16.1% (MoH performance report, in 2022)

The most common ailments across all ages are dominated by Malaria accounting for 32.1%, followed by cough or cold (20.4%), urinary tract infections (4.7%), and gastrointestinal problems (4%) of all health facility outpatient visits in addition to maternal health services. In the same report, steady improvements in the coverage of maternal health services such as antenatal care, birth in health facility and birth attended by skilled provider at 95%, 91% and 91% respectively in 2022[7] have been attained.
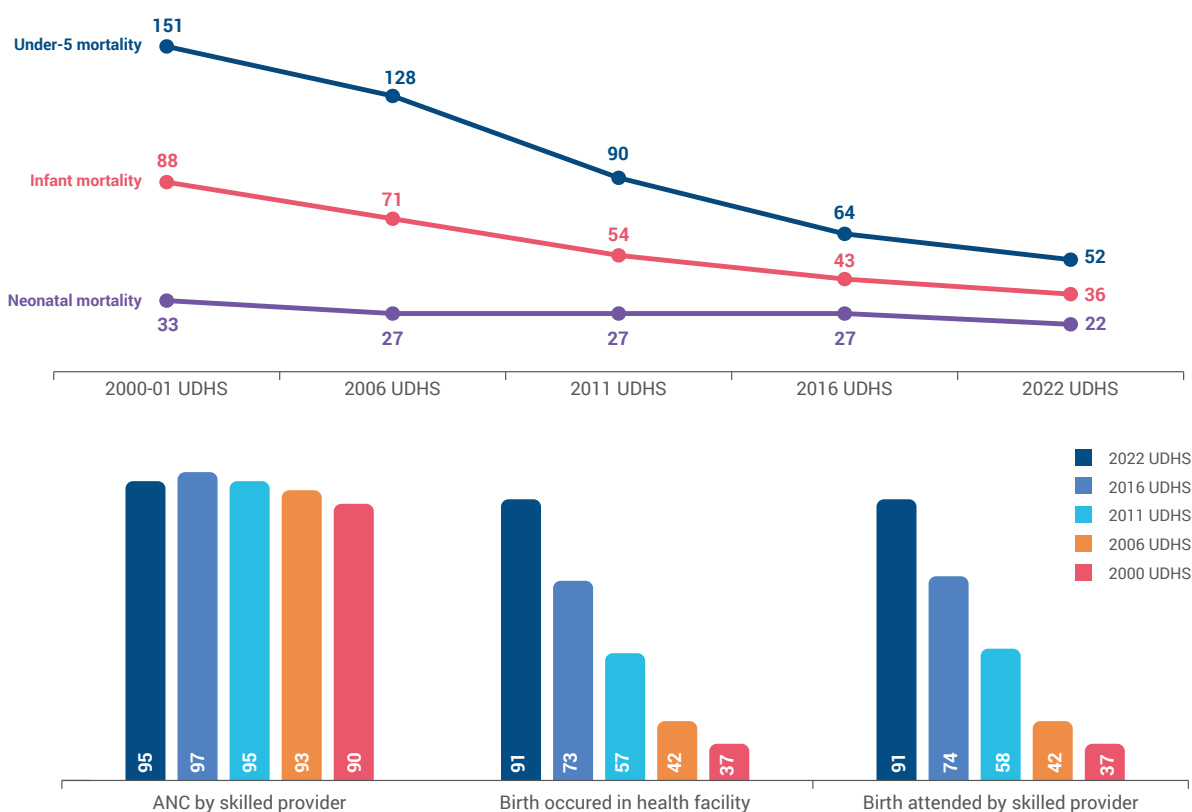
Figure 3: Trends in child mortality and maternal health care coverage.
Source: *Uganda Demographic Health Survey 2022.*

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5   https://www.ubos.org/wp-content/uploads/statistics/Rural_Urban_Population_for_the_146_Districts_in_Uganda.xlsx
6   Ministry of Health 2023. Annual Health Sector Performance Report Financial Year 2021/22.
7   UBOS 2022. Uganda Demographic and Health Survey (UDHS) 2022 Key Findings. https://www.ubos.org/wp-content/uploads/publications/09_2023UDHS_2022_Key_Findings_Presentation_B.pdf

1.1.4. Overview of the health system

Decentralization is the system of governance in Uganda. The decentralized system provides clear mandates to the central and local governments. The Ministry of Health is the central government agency responsible for initiating health legislation, health policy, sector strategies and planning, providing guidance, setting service standards, capacity building, undertaking research, monitoring, and evaluating health interventions, and disease patterns. The local governments are responsible delivery Primary Health Care and thus implementing the national policies in their locality as mandated by the 1995 Constitution of the Republic of Uganda, Public Health Act Cap 281 (enacted in 1935), and the Local Government Act 1997 (sec 97)[8].

To discharge its mandates, the ministry of health is under the Minister of health and two ministers of state. The Permanent Secretary is the accounting officer for health system resources assisted by the Undersecretary while the Director General provides technical guidance through the four directorates and the respective departments headed by Directors and Commissioners respectively. The Ministry has the directorate of Strategy, Policy and Development, Curative Services, Public Health and Health Governance and Regulation[9].

The ministry has semi-autonomous bodies established by Acts of parliament to support implement some of the central government responsibilities. For example, the health professional regulatory councils, the National Drugs Authority, the National Medical Stores, the Uganda National Health Research Organization, Uganda Virus Research Institute, the National Referral Hospitals (3), the Super Specialist Health Institutes, the Regional Referral Hospitals (17). The national referral facilities include Mulago National Referral Hospital, Butabika National Referral Mental Hospital, the Heart and Cancer Institutes. The 16 regional referral hospitals include Yumbe and Arua Regional Referral Hospitals in the West Nile Region, Gulu and Lira Regional Referral Hospitals in the Northern Region, Moroto Regional Referral Hospital in the Karamoja Region, Soroti, Mbale and Jinja Regional Referral Hospitals in the Eastern Region, Kayunga, Masaka, Entebbe Regional and Mubende Regional Referral Hospitals in the Central Region, Fort Portal, Kabale and Mbarara Referral Hospital in the Western Region.

To augment the tertiary services under the central government, the local governments provide Primary Health Care through General Hospitals, Health Centre IV, III, IIs which are aimed to serve 500,000, 100,000, **20-30,000** people and 5,000 people respectively. In addition, the Community based health promotion and disease prevention activities through Village Health Teams (VHTs) and Community Health Extension Workers service within a parish and village.

<div>

BOX 2

NATIONAL HEALTH FACILITY LEVELS AND CATCHMENT POPULATION

Type of Facility	Health Facility Population Ratio Standard
National Referral Hospital	1: 10,000,000
Regional Referral Hospital	1: 3,000,000 or 1 per region
General Hospital	1: 500,000 or 1 per District
HC VI	1: 100,000 or 1 per county
HC III	1: 20,000 or 1 per sub county
HC II	1: 5,000 or 1 per parish
HC I/VHT	1: 1,000 or 1 village

</div>

The district health services consist of public health facilities and private health facilities. The private subsector further consists of the private for profit owned by private entrepreneurs and private not for profit owned by Faith based organization. Whereas the private facilities charge a fee for the services, the public facilities provide services free of charge as they are publicly financed.

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8   Ministry of Health 2020. Ministry of Health Strategic Plan 2020/21 - 2024/25. http://library.health.go.ug/sites/default/files/resources/MoH%20Strategic%20Plan%20 2020_25.pdf
9   Ibid

HEALTHCARE SYSTEM COMPONENTS

Public sector		Private Medical Practice

Health workers under Armed forces

Private Health Providers | Private Not for profit (Faith Based) | Traditional and Complementary Medical Practitioners

Government Health

| National (MoH National Institite) → National Referral Hospital | 31,000,000 | Full range of services and teaching hospital |

| → Regional Referral Hospital | 2,000,000 | Wide range of services; also function as teaching hospitals in some areas |

| District → General Hospital | 500,000 | General medicine, surgery, paediatrics, obstetrics, Gynaecology, Dentistry, Anesthetia, Radiology, Clinical Labarotory, Community Health |

| County or constituency → HC VI | 100,000 | All services of HC III, surgery and Blood transfusion |

| Sub county → HC III | 20,000 | All services of HC II, Inpatient care and Environmental health |

| Parish → HC II | 500 | Outpatient care, Antenatal care, Immunization and Outreach services |

| Village → Village Health Team (VHT) | <500 | Links community to health system |

Figure 4: Overview of Uganda's Health system.

Source: *Adopted from Acup C, Bardosh KL, Picozzi K, Waiswa C, Welburn SC. Factors influencing passive surveillance for T. b. rhodesiense human african trypanosomiasis in Uganda. Acta Trop. 2017 Jan; 165:230-239*[10].

1.1.5. Health workforce context

The National Development Plan III and the Health Sector Strategic Plan II are the overarching policy instruments that guide the Human Resources for Health development. Under the Human Capital Development Program, the NDPIII aims "to increase the productivity of the population for increased competitiveness and better quality of life for all,". Similarly, the Health Sector Development Plan II aims to "accelerate movement towards universal health coverage (UHC) with focus on Primary Health Care (PHC) and improve population health, safety, and management by 2025,". It is imperative that the attainment of the NDPIII and HSSPII requires a high-performing health workforce equipped to meet the present and future health needs of the population.

The Ministry of Health developed the HRH Strategic Plan 2020–2030 with the aim of ensuring "*Individuals and communities in Uganda have equitable access to quality health services provided by a competent motivated and supported health workforce*" in line with the aspirations of achieving UHC. However, the attainment of the sector goals of Universal Health Coverage is significantly hampered by health workforce management and development issues. The HRH information system is weak and therefore it is difficult to access information on the production, registration, absorption into service, utilization of the available health workforce under one roof. The HRH information become scantier when dealing with the numbers of health work force in the private sector.

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10   Acup, C., et al., Factors influencing passive surveillance for T. b. rhodesiense human african trypanosomiasis in Uganda. Acta Trop. (2016), http://dx.doi.org/10.1016/j.actatropica.2016.05.009

As part of these efforts, the Ministry with support from development partners produced key policy documents such as the Ten-Year Human Resources for Health Strategic Plan (2020-2030) with a five-Year operational plan (2020-2025)[11]; the Ten-Year Training Plan (2020-2030) and key guidelines such as Schemes of Service and the restructuring and new staffing norms for the health sector.

The MOH provides guidance and oversight on the national health workforce requirements to meet the health needs of the population. It collaborates with other government entities such as the Ministry of Public Service, Ministry of Finance Planning and Economic Development, Ministry of Local Government, Ministry of Education and Sports, Health Service Commission (HSC), District Service Commissions, and key development partners in Training, planning, recruitment, deployment, and performance management the health work force.

BOX 3

VISION, MISSION, AND STRATEGIC OBJECTIVES OF THE HRH STRATEGIC PLAN 2020-2030

VISION: Individuals and communities in Uganda have equitable access to quality health services provided by a competent motivated and supported health workforce.

MISSION: To build resilient and responsive HRH system for sustainable development, availability, and accessibility of competent motivated health workforce for quality health services and improved health outcomes.

GOAL: To develop and maintain a well-performing appropriately skilled health workforce, equitably deployed and accessible at all levels of the health care system, providing quality health services.

Strategic Objectives:
1. Strengthen management systems for performance and productivity,
2. Strengthen leadership and governance for system resilience, responsiveness, and accountability,
3. Strengthen policy support and alignment of reforms and interventions,
4. Develop adequate health workforce to meet the changing health needs,
5. Strengthen multi-stakeholder partnerships for transformative change in quality health care,
6. Build capacity for innovative resource mobilization, efficient management, and investment multiplication to increase health workforce financing towards self-reliance[1].

1.2   RATIONALE OF THE HEALTH LABOUR MARKET ANALYSIS

The Government of Uganda is committed to strengthening the health system to realize UHC by 2030 based on a primary health care approach. It plans to achieve this by strengthening the governance, management, and coordination of the health sector, ensuring HRH management and development, improving access to disease and conditions' prevention and control interventions, strengthening disease surveillance, disaster response and epidemic control, and ensuring accessibility to quality and safe medicines, vaccines, and technologies, amongst other strategies. To actualize these strategies, investments has been made to improve the health infrastructure for improved service delivery, the magnitude of the health sector budget has been increased in recent years, and remunerations of health workers has been increased.

Despite these efforts, there remains the need for strategic investments towards ensuring universal access of Ugandans to adequate number and equitably distributed qualified, skilled, and motivated health workers at all levels of the health system. Meeting this need requires contemporary evidence on the health labour market (HLM) for the health workforce, specifically the political economy, education, supply, and the current and future demand based on health needs of the population. This evidence will unravel the areas for strategic investment to ensure that the drive to achieve UHC is attained.

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11   Ministry of Health 2021. Human Resources for Health Strategic Plan 2020 - 2030. https://www.health.go.ug/cause/human-resources-for-health-strategic-plan-2020-2030/

1.3 AIM AND OBJECTIVES OF THE HEALTH LABOUR MARKET ANALYSIS

The aim of the Uganda Health Labour Market Analysis (HLMA) study is to conduct in-depth analysis of the relationship between supply, demand and need of the health workforce in Uganda and recommend appropriate policy actions based on the contextual evidence.

The objectives are:

1. Conduct a descriptive HLM analysis of the health sector.

2. Predict the normative need of the health labour force to address the current and future disease burden.

3. Develop policy recommendations, regarding the production, inflows and outflows, maldistribution, inefficiencies, and regulation of the health workforce.

Evidence from this study will inform a multi-sectoral national policy dialogue on needed actions for ensuring universal access of Ugandans to qualified, skilled and motivated health workers at all levels of care.

SECTION 02
Implementation Approach

2.1   DESIGN

A phased multi-method design was applied in the conduct of the Uganda HLMA. The approaches applied included identification of key stakeholders applying a snowballing sampling technique, review of national documents, data extraction from relevant information systems, stakeholder consultations through key informant interviews and focus group discussions, triangulation of information, and descriptive and predictive analysis.

2.2   FRAMEWORK FOR THE HEALTH LABOUR MARKET ANALYSIS

The Uganda HLMA study was guided by the HLM framework for UHC (Figure 5). The framework provides insights on the relationship between the economy, population, and other societal drivers (including need for health services) and policies on the education, supply, demand and need for health workforce to achieve UHC in countries.
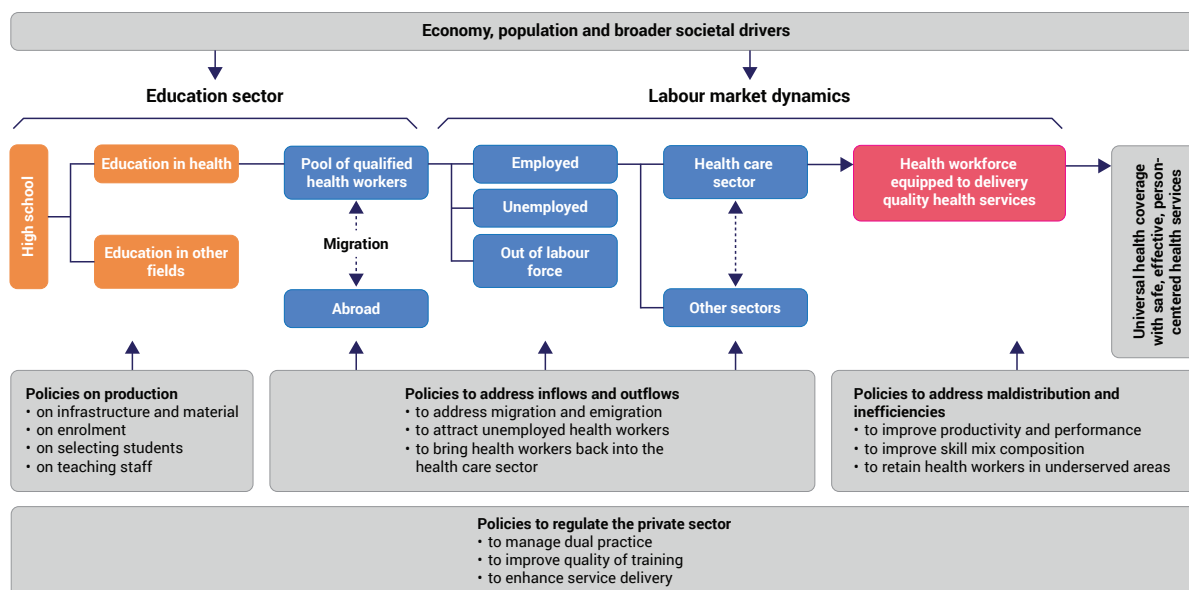
Figure 5: Health Labour Market Framework for UHC[12]

2.3 STAKEHOLDER MAPPING AND ENGAGEMENT

Under the leadership of the departments of Human Resources Management and Development in the MOH, key stake-holders in HRH were mapped to form a multi-sectoral team to lead the conduct of the HLMA. The team members were drawn from the other departments of the MOH, Regional Referral Hospitals, the three-health professional regulatory councils, the Ministry of Education and Sports (MoES), the Ministry of Local Government (MoLG), the Ministry of Gender, Labour, and Social Development (MoGLSD), and Uganda Bureau of Statistics (UBOS).

The technical team was trained on the process of conducting the Labour market analysis using the WHO HLMA guidebook and National Health Workforce Accounts (NHWA) handbook. The facilitators for the training were drawn from the Health Workforce Department of WHO Headquarters, Regional Office for Africa, and Uganda Country office. The training took place from 7th to 11th November 2022 in Jinja. During the meeting, consensus was built on the key policy questions that informed the Uganda HLMA[13] as the main output of the workshop.

They policy questions were the following:

1. What is the production capacity of health training institutions in Uganda in relation to needs?

2. What is the nature of the employment of health workers in Uganda? Employment rate vs unemployment rate

3. Is Uganda producing enough health workers to meet the population's health needs?

4. What is the production capacity for specialized health workers in relation to the need for specialized health care by the population?

5. What is the geographical distribution of health workers in Uganda and how can it be improved?

6. What incentives and remuneration can attract and retain health workers in the Uganda health system?

7. Why do health workers in Uganda engage in dual practice?

8. What factors will attract and retain health workers in rural and remote areas?

9. What factors drive migration and retention of specialists in Uganda?

The main multi-sectoral technical team was constituted into four task teams along the following domains: education, supply, demand, and macroeconomics, policy, and planning. The task teams were oriented on the data collection tools which contains the relevant indicators needed to address the policy questions. The data collection tool was derived from the WHO AFRO HLMA Analysis tool.

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12   World Health Organization 2021. Health labour market analysis guidebook. https://iris.who.int/bitstream/handle/10665/348069/9789240035546-eng.pdf?sequence=1
13   This report presents findings on the first five policy questions. The other questions will be addressed in subsequent exploratory HLMA.

2.4 DATA MAPPING, COLLECTION AND COLLATION

For the descriptive analysis, relevant sources of data for the domains and indicators were mapped by the task teams, and document review and data mining from relevant information systems ensued afterwards. Document review of national and MOH Policy and Strategy documents, as well as other grey literature was done with collected data included in the data collection tool. Two data collation workshops were held to collate the collected data and conduct preliminary analysis. Following the analysis, field data collection was initiated to collect primary data in the education domain from selected health training institutions.

A five-day workshop was conducted to map and collate data for the epidemiological need - based analysis. Mapped stakeholders, including representatives of the various health occupations and specialists that provide services across all levels of the health system and epidemiologists, attended this workshop. These stakeholders, within predefined focus group teams comprising of various health occupations, defined the essential interventions for each health occupation, identified the major causes of disease burden based on national surveys and the health information system data, mapped the disease burden to the population demographics, and matched the health interventions to the already mapped disease burden and population dynamics.

To ensure that data from trusted sources were used, the grading of data sources presented in **Figure 6** was adopted with priority given to data obtained from national surveys, followed by national policies, strategies, plans, reports and databases/ datasets, peer reviewed publications, databases of international agencies and expert opinions.

Type of data source		Example(s) of data sources
1. Most preferred	National surveys	Demographic Health Surveys, Population Census, Economic Survey etc.
2. Very Good	National Reports, policies and strategies, institutional datasets and reports	National Development Plan, National Health Policy, HRH Strategic Plan, NHWA, Database of professional councils and examination boards etc.
3. Good	High quality scientific publications	Peer reviewed articles applying any research method.
4. Satisfactory	Other databases	Websites of International agencies including WHO, World Bank, IHME etc.
5. Use with caution	Imputation with Expert opinions	Expert opinions

Figure 6: Grading of data sources for the analysis.

2.4.1 Descriptive analysis

Data collated from the secondary data sources were triangulated, analyzed, and presented using descriptive statistics, mainly as tables and charts with synthesized information described in themes, absolute figures, frequencies, percentages, and ratios. The timeframe is presented as trends or as of 2022 which was the benchmark for the data collection. To enable comparability with international classification of occupations, the categories of health workers in Uganda were matched to the International Standard Classification of Occupations (ISCO-08)[14].

2.4.2 Predictive analysis

The predictive analysis was undertaken to address the policy question - Is Uganda producing enough health workers to meet the population's health needs?

14

Health workforce supply forecasting was done by determining the inflow/entry into the current workforce and out-flow/attrition from the current workforce. Whilst the inflow is dependent on the training capacity and immigration, the outflow/attrition is influenced by retirements, emigration, deaths, resignations, and dismissals of the health workforce. Unfortunately, information on outflow/ attrition was not available in the information systems and could not be ascertained. The reported attrition rate of 4% in the strategic plan was used in this analysis.

Modelling of the aggregate economic demand for health workforce was informed by previous studies that indicate that overall economic growth, as measured by national income, is the best predictor of health expenditures from which the demand for health workers is derived. In other words, spending on healthcare tends to increase as overall national income increases, which in turn suggests that more workers will be employed to deliver health services. Thus, economic growth is the best predictor of demand for health workers. The demand modelling at macro level involved statistical analysis of the effect of gross domestic product (GDP) on employment in the public sector[15]. GDP is the value of total output or income that the country produced in a year. GDP forms the basis from which the Government generates tax revenue which is used to fund government expenditure including health expenditure and the health wage bill. A growing GDP also increases the ability of individuals and households to purchase health care in the private health sector. The analysis entailed the determination of whether GDP had any effect on employment using the equations shown below.

BOX 4	**EQUATION FOR MODELING THE AGGREGATE ECONOMIC DEMAND FOR THE HEALTH WORK-FORCE.**

Ln(Density of Health Workers)

$= \alpha + \beta1 \times LN$ GDP per capita_lagged 1 year

$\beta2 \times LN$ CHE per capita_lagged 1 year $+ \beta3 \times LN$ OOP $+ \beta3 \times$ GDP&OOP

$+$ error term

Where:

LN GDP per capita$_{lagged}$ 1 year is the per capita ***Gross Domestic Product*** of the Country with a one year lag (in natural logs)

x LN CHE per capita_lagged 1 year is the ***Current Health Expenditure per capita with a one year lag*** (in natural logs)

LN OOP is the ***Out-of-Pocket Health Expenditure*** (in natural logs)

LN GDP&OOP is the i***nteraction term between GDP per capita and Out-of -Pocket Health Expenditure***

Forecasting of the need-based requirements for health workers based on the recently approved staffing norms for the levels of care was done to ascertain health worker requirements and predicted gaps compared to the expected supply. This forecast was modelled using the Health Services Development Analysis approach whereby growth in the number of existing health facilities was modelled based on previous trends and Uganda's population growth. The number of health facilities by level of care was obtained from the annual health sector performance reports (AHSPR). To overcome the limitation of using fixed facility staffing norms which tends to produce status quo projections, the planned upgrades and probability of increased service utilization using the population growth rate versus the disease burden were used to adjust the annual projections. HRH needs are aggregated at the national level and not by level of care.

Modelling of the need-based requirements for health workers based on the population's health needs (epidemiological approach) was conducted based on the framework in figure 7[16]. This approach assumes that a country's health workers' need is determined by the *'need for health services'* as characterized by the levels of service delivery, disease burden and the population structure. Determining the health worker needs was based on estimating the population's need for health services and translating the needs into staffing requirements.

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15   Ahmat A, Asamani JA, Abdou Illou MM, Millogo JJS, Okoroafor SC, Nabyonga-Orem J, Karamagi HC, Nyoni J. Estimating the threshold of health workforce densities towards universal health coverage in Africa. BMJ Glob Health. 2022 May;7(Suppl 1): e008310. doi: 10.1136/bmjgh-2021-008310.

16   Asamani, J.A., Christmals, C.D. and Reitsma, G.M. Modelling the supply and need for health professionals for primary health care in Ghana: Implications for health professions education and employment planning. PLoS ONE 16(9): e0257957. https://doi.org/10.1371/journal. pone.0257957

Figure 7. Framework for Epidemiological Need-Based Health Workforce Planning
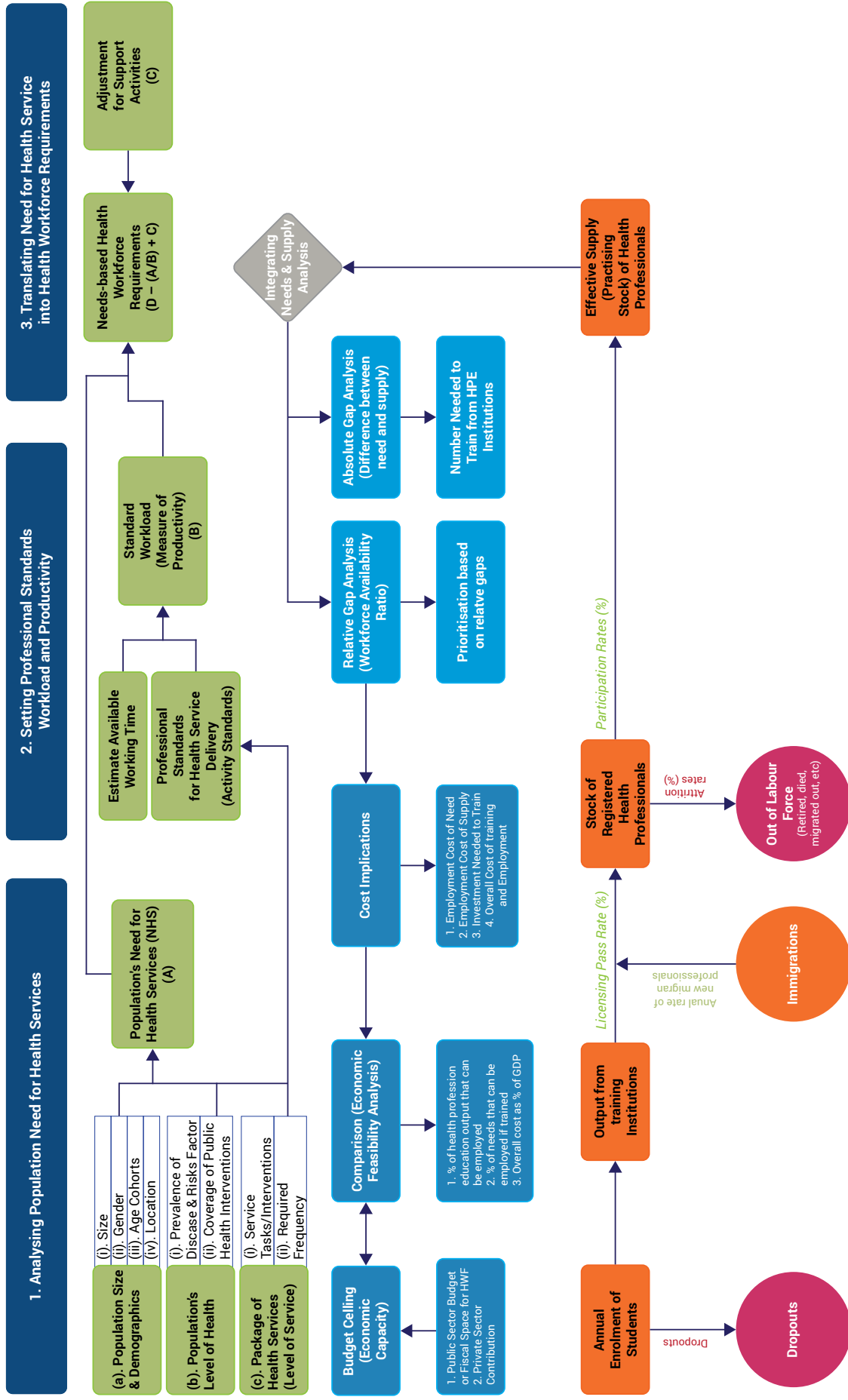
The population's need for health services was estimated by identifying the major causes (diseases and risk factors) of morbidity and mortality based on the AHSPR and DHIS. This process was supported by a team of epidemiologists, biostatisticians and health service providers drawn from all levels of service delivery and administrative units in the country. In addition to identifying these diseases and risk factors, the prevalence of the diseases and risk factors, and the coverage targets for the public health interventions were obtained from administrative reports, national plans, and gray and peer reviewed literature. The process of translating the needs into staffing requirements included agreeing on health service interventions and the average time for delivering them per patient, group, or task by an expert group of health workers, and calculation of standard workloads[17]. Subsequently, the need-based health workforce requirements were calculated using the equations in Box 2.

CALCULATION OF THE NEEDS-BASED HEALTH WORKFORCE REQUIREMENTS

$$NHS_t = \sum P_{i,j,g,t} \times [\, H_{h,i,j,t-1} \times (1+R_h)\,] \times L_{y,h,i,j,t} \qquad \text{... equation 2}$$

Where:

- NHS_t represents the 'needed health services' by a given population under a given service delivery model, $L_{i,j,t}$ over a period of time t.

- $P_{i,j,g,t}$ represents the size of the given population of age cohort i, gender j in location (rural or urban) g at time t in a given jurisdiction (this represents the population and its demographic characteristics).

- $H_{h,i,j,g,t}$ represents the proportion of the given population with health status h, of age cohort i, gender j in location g at time t (this represents the level of health of the population).

- $L_{y,h,i,j,g,t}$ represents the frequency of health services of type y planned or otherwise required, under a specified service model, to address the needs of individuals of health status h among age cohort i, gender j in location g over time t (this represents the level of service required by the population).

- R_h is the instantaneous rate of change of health status, h.

$$SW_{n,y} = \frac{AWT_n}{SS_{y,n}} \qquad \text{... equation 3}$$

Where:

- $SW_{n,y}$ is the standard workload for health professionals of category n when performing health service activity y.

- AWT_n is the annual available working time of the health professional of category n.

- $SS_{y,n}$ is the service standard or the time it takes a well-trained health professional of category n to deliver the service activity, y.

$$\text{Needs-based HWF requirements}_{n,y} = \sum \frac{NHS_{n,y,t}}{SW_{y,n}} \qquad \text{... equation 4}$$

- NHS_t represents the number of needed health service activities y, to be delivered by a health professional of category n at time t.

- SWn, y is the standard workload for health professionals of category n when performing health service activity y.

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17   The volume of work within one health service activity that one health worker can accomplish within a year to acceptable professional standards. World Health Organization (2010). Workload indicators of staffing need - User manual. (<http://apps.who.int/iris/handle/10665/44414>, accessed 11 October 2023).

Forecasting of the budget space for the health workforce assumed that the economic demand for health workers, i.e., a country's ability and willingness to pay for health workers in its efforts to meet the health needs of the population[18], can be estimated using fiscal space for the wage bill as a proxy and adjusting for the private sector contribution to health workforce employment. Another vital assumption is that governments and partners will not spend more than they can afford on health care, thus the forecast was informed by the health sector allocation for HRH. Accordingly, under constant conditions, the financial space for HRH would proportionate with the GDP with government maintaining a consistent percentage of GDP for health expenditure and a comparable percentage of general government health expenditure (GGHE) specifically for HRH. Furthermore, it is expected that the private sector will remain stable, with a roughly similar percentage of employment opportunities persisting.

2.5 VALIDATION

Two rounds of validation of the collected data and analyzed findings were conducted to ensure that the data presented show the correct picture in the country. These validation meetings were attended by representatives of various departments in the MoH (Human Resource Development, Human Resource Management, Clinical Services, Health Services, Planning, Financing and Policy etc.), MoES, MoGLSD, MoLG, Ministry of Finance, Planning and Economic Development (MoFPED), Ministry of Public Service (MoPS), UBOS, and National Planning Authority (NPA). Also in attendance were representatives of the Joint Admissions Board, Uganda Allied Health Professional Council, Uganda Nurses and Midwives Council, Uganda Nurses and Midwives Examination Board, Uganda Allied Health Examinations Board, Uganda Medical and Dental Practitioners Council, Uganda Protestant Medical Bureau, Uganda Catholic Medical Bureau, Uganda Muslim Medical Bureau, and Uganda Orthodox Medical Bureau.

Subsequently, national experts from the aforementioned ministries, institutions, and entities, and WHO headquarters, Regional Office for Africa and Country Office for Uganda expertly reviewed the findings.

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18   Richard M. Scheffler et al (2016). Health labor market analyses in low- and middle-income countries: An evidence-based approach. The World Bank. (<https://doi.org/10.1596/978-1-4648-0931-6>).

SECTION 03
The Political Economy and Macroeconomic Situation

3.1 OVERVIEW OF THE POLITICAL ECONOMIC CONTEXT OF HEALTH LABOUR MARKET IN UGANDA

3.1.1 Stakeholder Mapping

The analysis included mapping of the relevant key HRH stakeholders in Uganda who can influence the HRH agenda and HLM, specifically in the supply[19] and demand[20] for health workers. Table 1 below presents the various key stakeholders according to different levels, their objectives, roles, and positions. The stakeholders are categorized in two levels - national and local government levels. National level stakeholders include the Parliament, MOH, Office of the Auditor General and MOFPED, Ministry of Labour, MoE and Health Professional Associations among others. On the other hand, stakeholders within local government level include Public Service Boards (PSB), district health team and community members. The MOH provides the overall strategic direction of the health sector, including Health Policy, Strategy, Planning, Monitoring of service delivery, and supervision of the health workforce in Uganda.

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19 **Supply of health workers** represents the quantity of health workers who are willing to work at prevailing wages in a country's health services institutions.
20 **Demand for health** workers reflects the capacity and willingness of stakeholders, including government, the private sector, or international actors, to pay for the purchase of health care, which in turn drives the demand for employing health workers in public or private hospitals, health centres, and other parts of the health system, including self-employed health workers.

Table 1. HRH stakeholders in Uganda

Stakeholder	Priority/Objective	Roles and position	
		Supply	Demand
National			
Executive	Policy formulation	Funding and guidance +	Are the employers and determine scheme of service +
Parliament	Oversight of policy implementation	Appropriation of the budget +	Accountability +
MOH	Strategic direction of the health sector	Monitoring and supervision +	Planning and management of employed health workers +
Office of the Auditor General and Ministry of Finance (MOFPED)	Policy on availability and use of public funds	Allocation of budget estimates +	Ensure compliance to established systems, procedures etc. +
Ministry of Labour, Equal Opportunities Commission, Health Service Commission	Reduce social inequality and ensure equal opportunity	Compliance to labour and human resource laws and policies =	Compliance to labour and human resource laws and policies =
Ministry of Education, Education Standards Agency (ESA), Uganda Nurses & Midwives Examinations Board, and Uganda Allied Health Examinations Board (UAHEB)	Strategic direction on training of the workforce for all sectors including health	Workforce education, grading, and accreditation of institutions, set of education standards, award degrees +	Employ and regulate employable numbers. +
Ministry of Public Service	Regulates workforce management for all sectors	Policy development, in-service training, and development =	Policy and guidelines development, recruitment, and approval of staffing norms. =
Health Professional Councils	Ensure compliance to professional and education standards	Guidance and support accreditation of institutions	Arbitration and professional regulation +
Labour Unions	Advocacy for fairness	Advocacy and negotiations on standards	Advocacy for welfare of the workforce
Private Health Service Providers	Advocate for favorable regulations for practice and support government's health sector goals	Alternative health care +	Quality health care +
Media and Civil Society Organizations	Dissemination of health information	Create awareness on availability of the health workforce and their needs +	Create awareness on the need for the health workforce based on supply +
Local Governments			
Public Service Boards (PSB), District Health Team	Service delivery	Employers, regulators, resource allocation. +	Compliance with rules and regulations. +
Community members	Support healthcare systems and use health services across all levels	Advocacy and retention +	Participation in quality health service planning and delivery +

Position Key

+	Supportive	–	Not supportive	=	Neutral

3.2 MACROECONOMIC CONTEXT OF THE HEALTH LABOUR MARKET

3.2.1 Attractiveness and importance of health sector employment

3.2.1.1 Health sector contribution to GDP

The macroeconomy in the early years of Uganda's independence, registered impressive economic growth and development. In particular, during the early post-independence period (1962-1966), the economy grew at an average rate of 6.7% per annum. By the end of the 1960's, commercial agriculture accounted for more than one-third of the GDP, whereas industrial output had expanded to nearly 9% of GDP. The expansion was mainly from the then new food processing industries. However, the 1970s and early 1980s witnessed a persistent decline in the economy as a result of political instability, poor governance, and economic mismanagement.

Uganda's GDP at current price gradually increased from 3.1% in 2017 to 6.3% in 2018 and slightly remained constant in 2019 at 6.4% growth rate which drastically declined to 3% and then increased to 4.7% growth rate in 2022. The GDP per capita registered an increase from USD 824 in 2017 to USD 1,046 in 2022 as shown in **Figure 8** below.[21]

BOX 6	**GROSS DOMESTIC PRODUCT.**
	The total monetary or market worth of all the finished goods and services produced within a nation's boundaries during a certain time period is known as the gross domestic product (GDP). It serves as a thorough assessment of the state of the economy in a particular nation because it is a wide indicator of total domestic production.
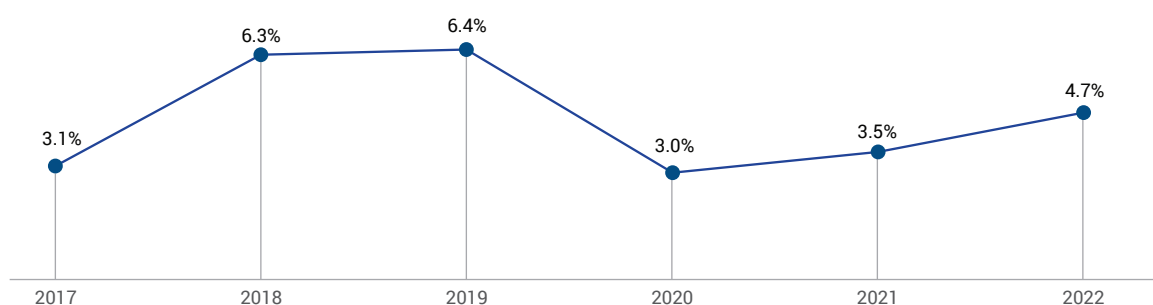
Figure 8: GDP growth rate (%)

Figure 9A represents a steady increase of the GDP at current price over the years from USD 30,744.47 million in 2017 to USD 45,557.23 million in 2022. Similarly, the GDP per capita at current price increased from 824 USD in 2017 to 1,042 USD in 2022 as shown in Figure 9B.
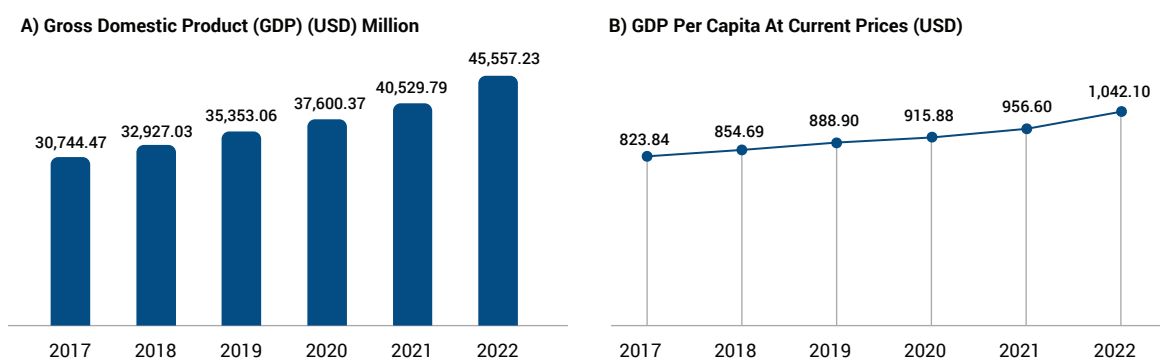
Figure 9: GDP current price and per capita.

Figure 10 shows that the percentage contribution of health to GDP in Uganda increased from 3.0% in 2016/17 to 3.3% in 2017/18 and remained constant in 2018/19 at 3.3% which later declined to 3.2% in 2019/20 and then increased to 3.4% in 2020/21 and 3.6% in 2021/2022.

Figure 10: Percentage contribution of human health and social work activities to GDP, 2016/17- 2021/22
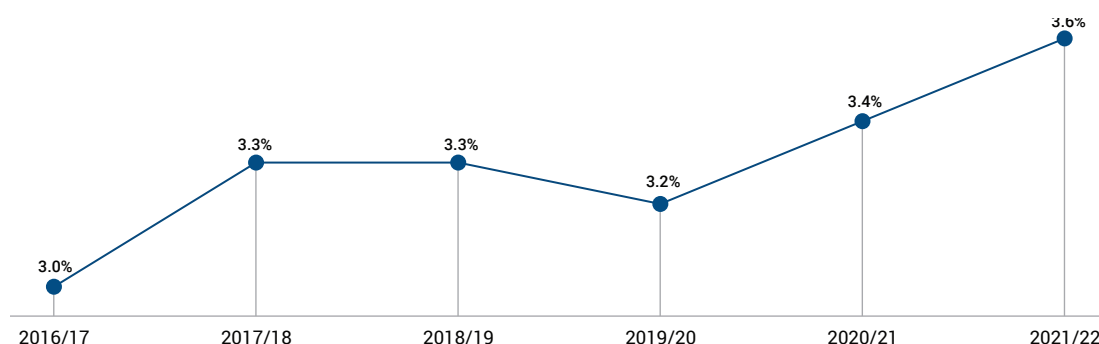
Source: *UBOS Statistical Abstract, 2022. Human health and social work activities include public health, private health, and social work.*

3.2.2 Remunerations and income relativities of the health workforce

3.2.2.1 Comparisons of health workforce wages between the public and private sectors

Table 2 shows variations in the health workforce wages between the public and private sectors. Overall, health workers employed in the public sector were highly paid compared to those employed in the private sector across all cadres. Medical specialists earn the highest wage in the public sector, followed by general practitioners, pharmacists, and dental surgeons. Social workers were the least paid cadre earning an average wage of UGX 9,582,418 in the public sector. The highest ratio of 4.8 was observed in the wages for physiotherapists employed in the public sector (UGX 52,901,712) and private sector (UGX 11,089,476).

Table 2: Comparison of health workforce wages between public and private sector

Occupation Title	Public sector wage (in UGX)	Private sector wage (in UGX)	Ratio of public to private
General practitioners	64,901,712	34,500,636	1.9
Medical specialists	72,858,660	50,650,644	1.4
Physicians/ Internal medicine			
Obstetrics and Gynecology	72,858,660	50,650,644	1.4
General Surgery	72,858,660	50,650,644	1.4
Pediatricians	72,858,660	50,650,644	1.4
Emergency medicine	72,858,660	50,650,644	1.4
Family Medicine	72,858,660	50,650,644	1.4
Ear Nose and Throat Surgeons	72,858,660	50,650,644	1.4
Orthopedic surgeons	72,858,660	42,000,000	1.7
Ophthalmologists	72,858,660	50,650,644	1.4
Pathologists	72,858,660	31,021,668	2.3
Radiologists	72,858,660	50,650,644	1.4
Microbiologists	72,858,660	50,650,644	1.4
Psychiatrists	72,858,660	70,693,848	1.0
Anesthesiologists	72,858,660	50,650,644	1.4

Occupation Title	Public sector wage (in UGX)	Private sector wage (in UGX)	Ratio of public to private
Dental Surgeons	64,901,712		
Pharmacists	64,901,712	40,540,476	1.6
Enrolled nurse	17,059,608	6,711,948	2.5
Enrolled midwife	17,059,608	6,651,036	2.6
Registered Nurse	31,301,712	10,103,796	3.1
Registered Pediatric Nurse	31,301,712	10,103,796	3.1
Registered Palliative Care Nurse	31,301,712	10,103,796	3.1
Registered Public Health Nurse	31,301,712	10,103,796	3.1
Registered Mental Health Nurse	31,301,712	10,103,796	3.1
Registered midwife	31,301,712	10,103,796	3.1
Anesthetic Officer	52,901,712	15,012,312	3.5
Assistant Nutritionist	31,301,712		
Chiropractor	31,301,712		
Medical Clinical Officer	31,301,712	11,800,932	2.7
Dispenser	31,301,712	15,600,000	2.0
Environmental Health Officer	52,901,712		
Health Assistant	17,059,608	8,732,628	2.0
Health Inspector	52,901,712		
Medical Imaging Technologist	52,901,712	18,879,504	2.8
Medical Laboratory Assistant	17,059,608	11,086,452	1.5
Medical Laboratory Technician	31,301,712	19,607,712	1.6
Medical Laboratory Technologist	31,301,712	23,564,412	1.3
Medical Radiographer	31,301,712	19,265,064	1.6
Medical Sonographer	31,301,712		
Nutritionist	52,901,712	13,497,840	3.9
Occupational Therapist	31,301,712		
Optometrist	31,301,712		
Orthopedic Officer	31,301,712	10,684,800	2.9
Orthopedic Technologist	31,301,712		
Pharmacy Assistant	17,059,608	7,633,440	2.2
Physiotherapist	52,901,712	11,089,476	4.8
Public Health Dental Officer	31,301,712		
Public Health Officer	52,901,712		
Speech and Language Therapist	52,901,712		
Theatre Assistant	18,701,712		
Vector Control Officer	31,301,712		
Social Workers	9,582,418	11,347,140	0.8
Epidemiologist	52,901,712		

Sources: *1. Public sector - Ministry of Public Service Circular Standing Instruction NO.1 of 2022*

2. Private sector – Human Resource staffing data from the Private not for profits for 2022

3.2.2. Public sector allocations for wages

Figure 11 shows that there has been a steady increase in the public health sector wage bill in Uganda in relation to the health sector budgets from 2018/19 to 2022/23 financial years. In a period of 7 years the wage bill has increased by 15% (from 9% to 24%). However, the increase in wage was driven by an increase of salaries of health cadres and not numbers.
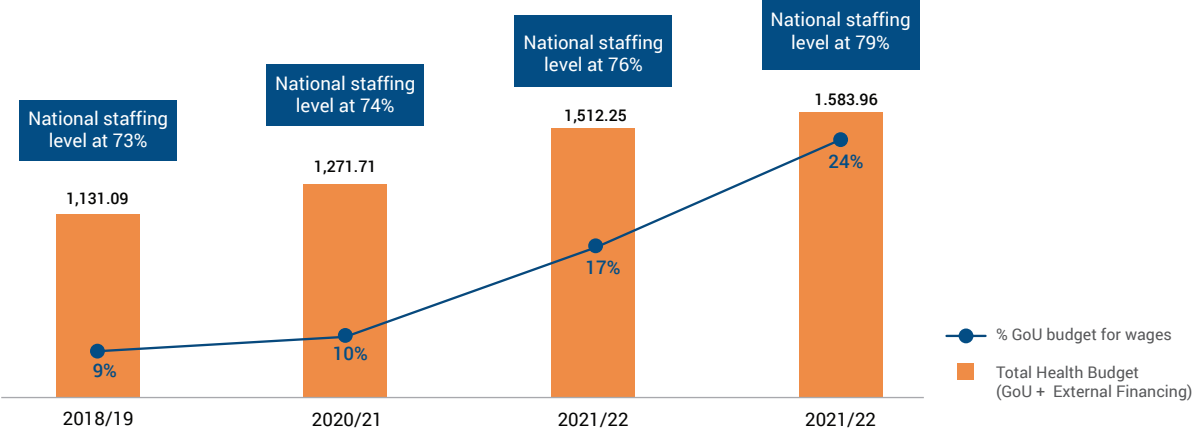
Figure 11: Public health sector wage bill in Uganda in relation to the health sector budgets, 2018/19 to 2022/23 and national health sector staffing levels.

Sources: *Triangulated from MOH ministerial policy statement reports, National Budget Framework Papers 2019 – 2023, the national budget speech for 2023/24 and HRH Audit Report FY 2021/22.*

3.2.3. District allocations for wages

The percentage of district government expenditure in HRH is shown in Figure 12. The majority of the districts spend between UGX 8.5 billion and UGX 55.7 billion. Few districts spend more than UGX 59.6 billion with one district spending as high as UGX 125.7 billion. On average, district government spends in the range of 11% to 18% in HRH.
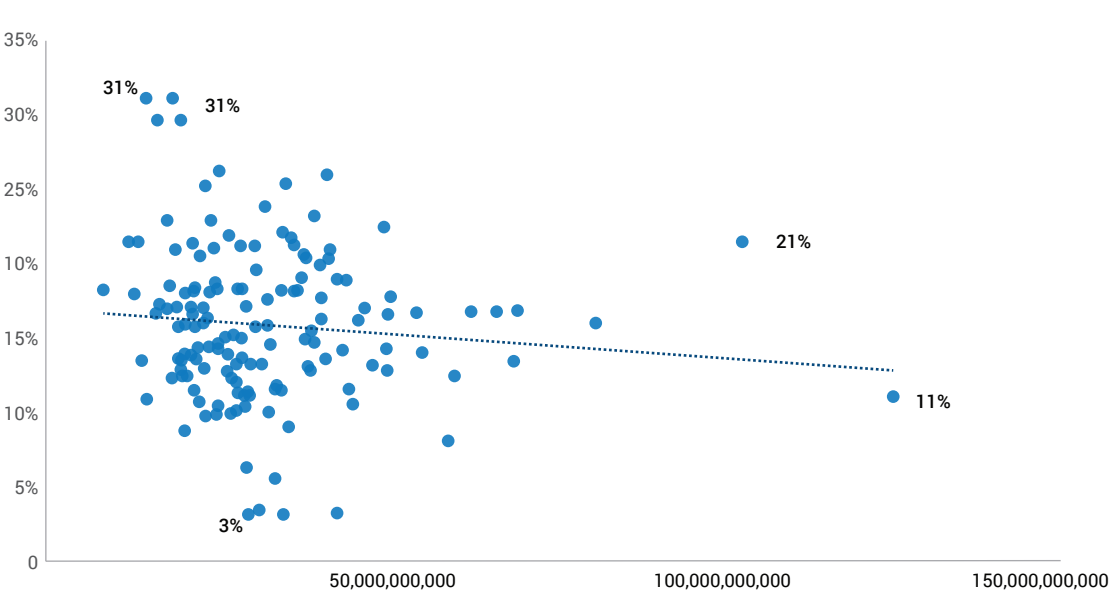
Figure 12: Percentage of District Government expenditure on HRH.

Percentage: 30% and above –Lyantonde, Buliisa and Kalangala districts. 25% - 29% - Ntoroko, Kiboga, Mityana, Bundibugyo and Moyo Districts

Magnitude: Wakiso District= UGX 125 billion, Kasese District = UGX 103 billion, Tororo District = UGX 81 billion and Kamuli District = UGX 70 billion.

SECTION 04
Descriptive Health Labour Market Situation

4.1   EDUCATION AND PRODUCTION CAPACITY

4.1.1. Training Institutions

As of 2022, Uganda had a total of 210 health training institutions. The private for-profit owned health training institutions were in majority (n=133), representing 63.3%, compared to the government [22.4% (n=47)] and the private not for profit [14.3% (n=30)] owned health training institutions, as shown in Figure 13 below.
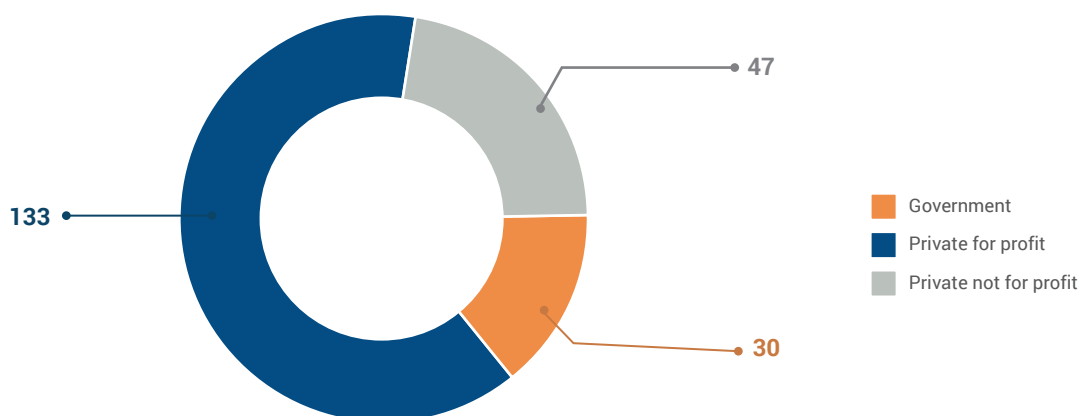
Figure 13: Ownership of 210 health training institutions in Uganda.

Figure 14 presents the distribution of 210 health training institutions in Uganda by district and their ownership. Among the 66 districts, there were more health training institutions in Kampala (n=36) compared to the rest of the districts, representing 17.1%, probably because Kampala district is the capital city. The second districts with the highest number of health training institutions were Lira and Wakiso with each district having 11 training institutions. Six districts (Kampala, Lira, Gulu, Masaka, Mbale, and Mbarara) had all three categories of health training institutions (government, private and private not for profit) with still private owned being the majority. Thirty-four districts had only one health training institution.
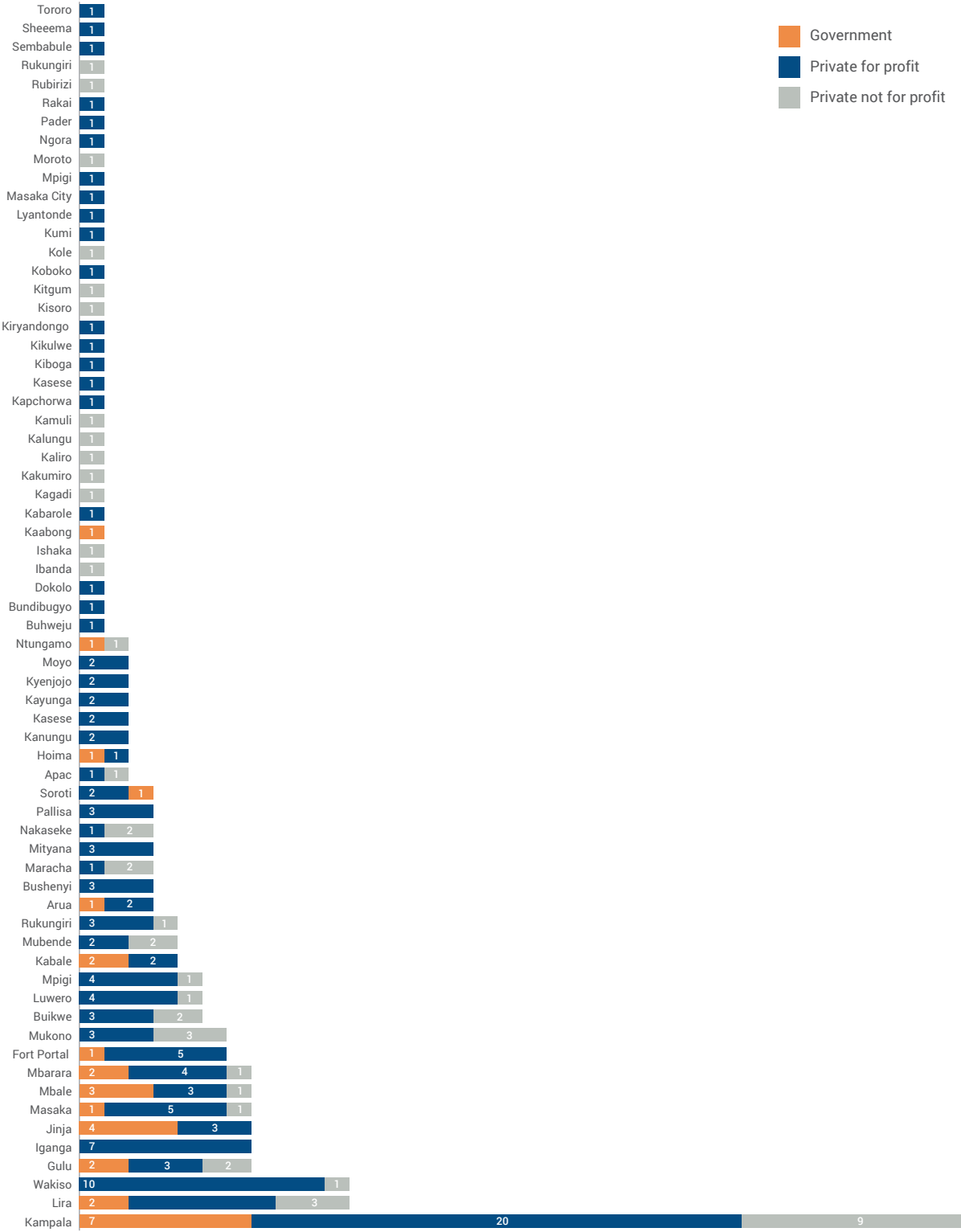
Figure 14: Distribution health training institutions in Uganda by district and ownership.

4.1.2 Training programs, duration, and capacity

Table 3 shows the distribution of health training institutions in Uganda by program - medicine, nursing, midwifery, and pharmacy - and ownership in 2022. There was a total of 28 health training institutions offering medicine programs, 193 health training institutions offering midwifery programs, 208 health training institutions offering nursing programs and 47 health training institutions offering pharmacy programs. Most of the government health training institutions were offering the medicine programs [19 (67.8%)] compared to private [3 (10.7%)] and private not for profit [6 (21.4%)] institutions. Most of the private health training institutions are offering midwifery [55.4% (n=107)], nursing [56.3% (n=117)] and pharmacy [78.7% (n=37)] programmes.

Within the medical field, a total 12 (42.9%) health training institutions were offering Bachelor of Medicine and Bachelor of Surgery (MBChB) program. The duration for the training for the MBChB program was 60 months. Among the 193 training institutions offering midwifery programs, Bachelor of Science in Midwifery program had the highest duration of training of 48 months. Of the 208 training institutions offering nursing programs, the majority [56.3% (n=117)] of the institution are offering Certificate in Nursing programme. On the duration of the nursing programs, Bachelor of Nursing Science had the highest duration of training of 48 months. High number of health training institution were offering Certificate in Pharmacy (28) when compared to Diploma in Pharmacy (19) programmes.

Results on the distribution of training capacities[22] for selected programs (65) showed that overall, the highest capacity for training programmes was available for Certificate in nursing and certificate in midwifery programs regardless of ownership (Table 4). Government owned health training institutions had capacities for 58 programmes while private and private not for profit had capacities for 31 and 18 programmes, respectively. Regardless of ownership, most of the capacities available are for certificate and diploma programmes.

Government health training institutions had no capacity in seven of the selected programmes namely Certificate in Comprehensive Nursing, Bachelor in Midwifery, Bachelor of Science in Midwifery, Bachelor of Nursing Science-Extension, and Certificate in Clinical and Community Nutrition.

Table 3: Distribution health training institutions by programs (for medicine, nursing, midwifery, and pharmacy) and ownership

Program	Duration of training (months)	Government	Private for profit	Private not for profit	Total
Medicine		**19**	**3**	**6**	**28**
MBChB	60	7	3	2	12
M. Med: Internal Medicine	36	1		1	2
MMed Family Medicine	36	1			1
MMed Microbiology	36	1			1
MMed Ophthalmology	36	1			1
MMed Peadiatrics and Child Health	36	1		1	2
MMed Pathology	36	1			1
MMed Psychiatry	36	1			1
MMed Radiology	36	1			1
MMed Ear, Nose &Throat	36	1			1
MMed General Surgery	36	1		1	2
MMed Obstetrics &Gynecology	36	1		1	2
MMed Anesthesia	36	1			1
Midwifery		**31**	**107**	**55**	**193**
Certificate in Midwifery	30	8	74	35	117
Diploma in Midwifery	36	6	3	2	11

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22   Training capacity is defined as the quantity of students that can be accommodated in a specific training institution or program per year.

Program	Duration of training (months)	Government	Private for profit	Private not for profit	Total
Diploma in Midwifery (E-Learning)	24	6	2	2	10
Diploma in Midwifery (extension)	18	9	26	16	51
Bachelor of Science in Midwifery	48	2	2	0	4
Nursing		**31**	**117**	**59**	**208**
Certificate in Mental Health Nursing	30	1			1
Certificate in Nursing	30	8	72	37	117
Diploma in Comprehensive Nursing	18	2			2
Diploma in Comprehensive Nursing (extension)	36	2	1		4
Diploma in Mental Health Nursing	36	1			1
Diploma in Mental Health Nursing -Extension	18	1			1
Diploma in Nursing	36	4	14	6	24
Diploma in Nursing (extension)	18	9	30	16	55
Diploma in Peadiatrics Nursing -Extension	18	1			1
Diploma in Public Health Nursing	12	1			1
Advanced Diploma in Palliative Care Nursing	12	1			1
Bachelor of Nursing Science	48	11	8	2	21
Pharmacy		**8**	**37**	**2**	**47**
Certificate in Pharmacy		4	23	1	28
Diploma in Pharmacy		4	14	1	19

Sources: *1. Joint Admissions Board Forms (MOES) 2. Uganda Allied Health Proffesional Council (UAHPC) 3. Uganda Nurses And Midwives' Council. (UNMC) 4. Uganda Nurses And Midwives' Examination Board. (UNMEB) 5. Uganda Allied Health Examinations Board. (UAHEB) 6. Uganda Medical And Dental Practitioners' Council Annual Reports 7. Uganda Allied Health Examinations Board*

Table 4: Distribution of training capacities for selected programs by ownership

Program	Ownership			
	Government	Private For Profit	Private Not For Profit	Total
Certificate in Nursing	1100	4805	2700	8605
Certificate in Midwifery	730	3675	1900	6305
Diploma in Nursing -Extension	600	1320	700	2620
Certificate in Medical Laboratory Techniques	140	1680	470	2290
Diploma in Clinical Medicine and Community Health	240	1670	80	1990
Diploma in Midwifery -Extension	440	820	500	1760
Diploma in Medical Laboratory Technology	210	660	260	1130
Diploma in Nursing	280	600	230	1110
Certificate in Pharmacy	180	880	40	1100
MBChB	275	350	350	975
Diploma in Pharmacy	190	520	50	760
Bachelor of Nursing Science (BNSc)	146	350	50	546
Certificate in Theater Techniques	120	190	120	430
Certificate in Medical Records and Health Informatics	80	280	40	400

Program	Ownership			
	Government	Private For Profit	Private Not For Profit	Total
Diploma in Midwifery	150	150	50	350
Diploma in Midwifery E-Learning	190	90	60	340
Diploma in Health Leadership and Management	230	70		300
Certificate in Environmental Health Sciences	250	40		290
Diploma in Environmental Health Sciences	230	40		270
Diploma in Anesthesia	160	40	40	240
Certificate in Comprehensive Nursing		175	60	235
Diploma in Medical Records and Health Informatics	50	160		210
Diploma in Comprehensive Nursing	180			180
Diploma in Public Health Dentistry	120	40		160
Bachelor in Midwifery		150		150
Certificate in Mental Health Nursing	150			150
Diploma in Comprehensive Nursing -Extension	110	30		140
Diploma in Mental Health Nursing	100			100
Bachelor of Nursing Science- Completion (BNSc)	85			85
Diploma in Clinical and Community Nutrition	40	40		80
Bachelor of Medical Laboratory Sciences-Direct	75			75
Diploma in Mental Health Nursing -Extension	70			70
Bachelor of Pharmacy	66			66
Bachelor of Medical Laboratory Sciences-Completion	65			65
Bachelor of Science in Midwifery		65		65
Diploma in Dental Technology	60			60
Diploma in Health Promotion and Education	60			60
Diploma in Medical Entomology and Parasitology	60			60
Diploma in Orthopedic Medicine	60			60
Bachelor of Science in Pharmaceutical Sciences	54			54
Bachelor of Public Health	53			53
Bachelor of Nursing Science-Extension		50		50
Diploma in Clinical Psychiatry	50			50
Diploma in Medical Radiography	50			50
Diploma in Public Health Nursing	50			50
Higher Diploma in Clinical Psychiatry	50			50
Certificate in Clinical and Community Nutrition		40		40
Diploma in Audiology	40			40
Diploma in Clinical Nutrition	40			40
Diploma in Clinical Ophthalmology	40			40
Diploma in Occupational Therapy	40			40
Diploma in Orthopedic Technology	40			40
Diploma in Physiotherapy	40			40
Higher Diploma in Clinical Ophthalmology	40			40

Program	Ownership			
	Government	Private For Profit	Private Not For Profit	Total
Bachelor of Science in Physiotherapy-Direct	35			35
Advanced Diploma in Palliative Care Nursing	30			30
Bachelor of Anesthesia	30			30
Diploma in Peadiatrics Nursing -Extension	30			30
Diploma in Ear, Nose and Throat Surgery	20			20
Higher Diploma in Ear, Nose and Throat Surgery	20			20
Diploma in Emergency Medicine for Emergency care practitioners	7			7
Bachelor of Science in Physiotherapy-Completion	5			5

Sources: *1. Uganda Nurses and Midwives Examination Board. (UNMEB) 2. Uganda Allied Health Examinations Board. (UAHEB) 3. Uganda Medical and Dental Practitioners' Council*

4.1.3 Annual applications into health programs

Table 5 shows the number of annual applications into diploma health programs. Diploma in Clinical Medicine and Pharmacy programs had the overall highest volumes of applications since 2019/2020 academic year. For the Clinical Medicine programs during 2019/2020 academic year there were 6,176 applications, 7,567 applications in 2021/2022 and 8,676 applications in 2023/2024, thus showing a consistent increase in volumes of applications. Across all the programs, there were low volumes of applications during the 2022/2023 academic year. From 2019 to 2024, the number of applications for this program increased by 40%. Diploma in Registered Nursing program had the highest increase rate of applications (152%) between the academic years of 2019 and 2024, followed by diploma in psychiatric nursing (133%) and Diploma in Physiotherapy (132%) programs. On the other hand, Diploma in Environmental Health programs had the lowest rate of applications (-1%). For all the diploma programs, the number of applications increased during 2023/24 academic year except for one program (Diploma in Environmental Health) and no application was received for diploma in Comprehensive Nursing.

Table 5: Annual applications into diploma health programs

Diploma Programs	Academic year				
	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Clinical Medicine	6,176	6,636	7,567	231	8,676
Pharmacy	3,538	4,147	4,691	134	5,993
Registered Nursing	1,749	1,896	2,041	145	4,413
Medical Laboratory	2,929	1,981	3,531	121	4,080
Orthopedic Medicine	1,333	1,526	2,115	42	2,489
Dental Technology	952	1,184	1,171	31	1,798
Public Health Dentistry	1,259	1,565	1,700	49	1,780
Midwifery	998	1,198	1,297	25	1,745
Psychiatric Nursing	508	665	769	26	1,179
Clinical Psychiatry	469	525	654	33	955
Radiography	551	633	1,006	42	865
Orthopedic Technology	356	416	561	20	716
Physiotherapy	305	461	539	21	710
Medical Records	282	377	342	15	525

Diploma Programs	Academic year				
	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Clinical & Community Nutrition	268	416	452	10	508
Entomology & parasitology	234	268	314	5	362
Environmental Health Sciences	258	198	336	14	256
Occupational Therapy	152	150	180	8	171
Comprehensive Nursing	1,894	2,173	2,393	47	

Source: *Joint Admission Board Secretariat*

Analysis of selected applications into seven Bachelor and Master's programmes during 2021/ 2022 from 15 Universities in Uganda show that majority of the applications were for MBChB (5,958), BSc in Nursing Science (1,677) and BSc in Anesthesia (1,311) programs, in that order, as shown in Figure 15. Some Universities reported not receiving any applications in BSc in Midwifery and BSc in Anesthesia.

	MBChB	BSc. Nursing Science	BSc. Midwifery	BSc. Public Health	BSc. Anaesthesia	BSc. Env Health	MPH
Mean	694	216	149	331	444	84	149
Median	2064	775	130	383	372	90	151
Min	50	36		53		22	14
Max	5958	1677	278	457	1311	122	275

Figure 15: Applications into select Bachelor and master's programs from 2021/2022 academic year.

Sources: *Aga Khan University, Bishop Stuart University, Bugema University, Busiitema University, Cavendish University, Gulu University, Islamic University in Uganda, King Ceasor University, Makerere University, Mbarara University, Mountains of the Moon University, Muni University, Soroti University, Uganda Christian University and Victoria University.*

4.1.4 Annual student enrolments

Trends in enrolments into certificate and diploma programs in Nursing and Midwifery has been consistently high for certificate in nursing between 2016 and 2023, as shown in Table 6. The higher annual enrolment for male than female students was recorded for Certificate in Nursing and Diploma in Comprehensive Nursing programmes in the years 2016 and 2017, and Diploma in Mental Health Nursing programme in 2016. Otherwise, female student annual enrolments are high for majority of the certificate and diploma programs in Nursing and Midwifery. There has been no male student enrolment for Certificate in Midwifery, Diploma in Midwifery (extension), Diploma in Midwifery (E-Learning), and Diploma in Midwifery programmes since 2016. In 2023, no student was enrolled in Diploma in Comprehensive Nursing, Certificate in Comprehensive Nursing, and Diploma in Comprehensive Nursing (extension) programmes.

Table 6: Trends in enrolments into certificate and diploma programs in Nursing and Midwifery by gender

Programs	2016			2017			2018			2019			2021			2022		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Certificate in Nursing	2845	2759	5604	2517	2458	4975	2560	2872	5432	3770	4676	8446	3323	4083	7406	5340	8446	13786
Diploma in Nursing (extension)	309	516	825	258	512	770	378	598	976	398	769	1167	454	790	1244	710	1112	1822
Certificate in Midwifery	0	3582	3582	0	3351	3351	0	3644	3644	0	4856	4856	0	4482	4482	0	6282	6282
Diploma in Midwifery (extension)	0	353	353	0	501	501	0	564	564	0	780	780	0	798	798	0	960	960
Diploma in Midwifery (E-Learning)	0	128	128	0	109	109	0	48	48	0	50	50	0	231	231	0	111	111
Diploma in Nursing	89	92	181	141	119	260	111	110	221	104	106	210	74	100	174	151	161	312
Certificate in Mental Health Nursing	50	77	127	79	108	187	61	110	171	58	74	132	51	81	132	45	101	146
Diploma in Peadiatrics and Child Health Nursing (extension)	0	2	2	0	5	5	8	2	10	1	3	4	0	0	0	3	7	10
Diploma in Mental Health (extension)	17	29	46	14	16	30	15	18	33	11	22	33	7	18	25	9	16	25
Diploma in Palliative Care Nursing	0	0	0	0	0	0	0	0	0	6	19	25	0	3	3	4	9	13
Diploma In Public Health Nursing	0	0	0	5	7	12	1	2	3	0	0	0	5	9	14	6	5	11
Diploma in Midwifery	0	121	121	0	84	84	0	88	88	0	37	37	0	41	41	0	71	71
Diploma in Mental Health Nursing	26	18	44	0	0	0	15	14	29	8	7	15	18	7	25	20	20	40
Diploma in Comprehensive Nursing	50	43	93	103	71	174	47	48	95	45	33	78	63	63	126	85	75	160
Certificate in Comprehensive Nursing	506	563	1069	581	821	1402	496	829	1325	504	786	1290	528	1002	1530	21	128	149
Diploma in Comprehensive Nursing (extension)	69	72	141	34	38	72	60	43	103	31	20	51	22	21	43	5	8	13

Source: *Uganda Nurses and Midwives Examinations Board (UNMEB).*

The trends in enrolments into certificate and diploma programs for allied health professionals has been inconsistent over the six years since 2017/2018 academic year (**Table 7**). Eight health programmes recorded a positive increase in number of students enrolled over the six academic years since 2017/2018. There were no students enrolled into Diploma in Health Counselling and Social Care since 2017/2018. In 2022/2023 academic year, the highest enrolment was for Certificate in Medical Laboratory Techniques program with a total of 1,350 students. Eight programs had a total number of students enrolled ranging from 112 and 788.

Table 7: Trends in enrolments into certificate and diploma programs for allied health professionals

PROGRAMMES	NUMBER ENROLLED				
	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Certificate in Medical Laboratory Techniques	1643	2221	2038	1598	2142
Certificate in Environmental Health Sciences	315	258	337	341	408
Certificate in Medical Theatre Techniques	169	228	297	189	194
Certificate in Medical Records and Health Informatics	14	135	207	169	238
Certificate in Pharmacy		221	849	857	1244
Diploma in Anesthesia	68	74	74	61	99
Diploma in Health leadership & Management	93	128	141	126	124
Diploma in Health Promotion & Education	7	4	7	11	9
Diploma in Psychiatric Clinical Medicine	2	2	1	3	2
Diploma in Ear, Nose, Throat & Neck Surgery	2	3	3	7	9
Diploma in Ophthalmic Clinical Medicine	20	17	26	31	19
Diploma in Audiology	2	2	3	2	2
Diploma in Public Health Dentistry	139	129	141	114	144
Diploma in Medical Entomology & Parasitology	25	21	12	6	11
Diploma in Medical Radiography	38	36	44	30	30
Diploma in Occupational Therapy	19	19	15	15	10
Diploma in Orthopedic Medicine	69	72	67	58	61
Diploma in Orthopedic Technology	28	27	24	17	15
Diploma in Dental Technology	15	9	9	13	12
Diploma in Pharmacy	305	407	601	418	556
Diploma in Physiotherapy	31	34	27	22	28
Diploma in Environmental Health Sciences	150	136	156	176	157
Diploma in Medical Laboratory Technology	628	619	722	435	474
Diploma in Medical Records & Health Informatics	19	53	34	34	64
Diploma in Clinical Psychiatry	44	56	47	75	59
Diploma in Clinical & Community Nutrition	39	37	35	32	32
Diploma in Clinical Medicine & Community Health	1627	1459	1377	1259	1871
Diploma in Clinical Ophthalmology		36	32	27	70
Diploma In Ear Nose and Throat Surgery					24

Source: *Uganda Allied Health Examinations Board (UAHEB) 2023*

Figure 16 shows that there was high admission into MBChB program compared to other selected Bachelor and Masters' programs offered in 15 Universities in Uganda during the 2021/ 2022 academic year with a mean of 609 admissions. Other degree programs which had a high number of admissions of at least hundred on average were BSc. Public Health (394), BSc. Nursing Science (336), MPH (146), BSc. Biomedical Laboratory Technology (146), and BSc Midwifery (132). Some health training institutions did not admit students into the nine programs such as BSc. Dental Surgery and BSc. Pharmacy.

	MBChB	BSc Dental Surgery	BSc Pharmacy	BSc Biomedical Lab Tech	BSc Medical Radiography	BSc Biotech-nology	BSc Optometry	BSc Cytotech-nology	BSc Biomedical Sciences	BSc. Nursing Science	BSc. Midwifery	BSc. Public Health	BSc. Anaesthesia	BSc Environ-Health	MPH
Mean	609	38	93	146	20	52	22	31	52	336	132	394	34	199	146
Median	767	51	130	178	22	68	29	42	64	295	126	454	40	199	150
Min	985	71	166	264	54	94	35	53	125	662	246	623	57	199	272
Max	115									34	17	58		199	14

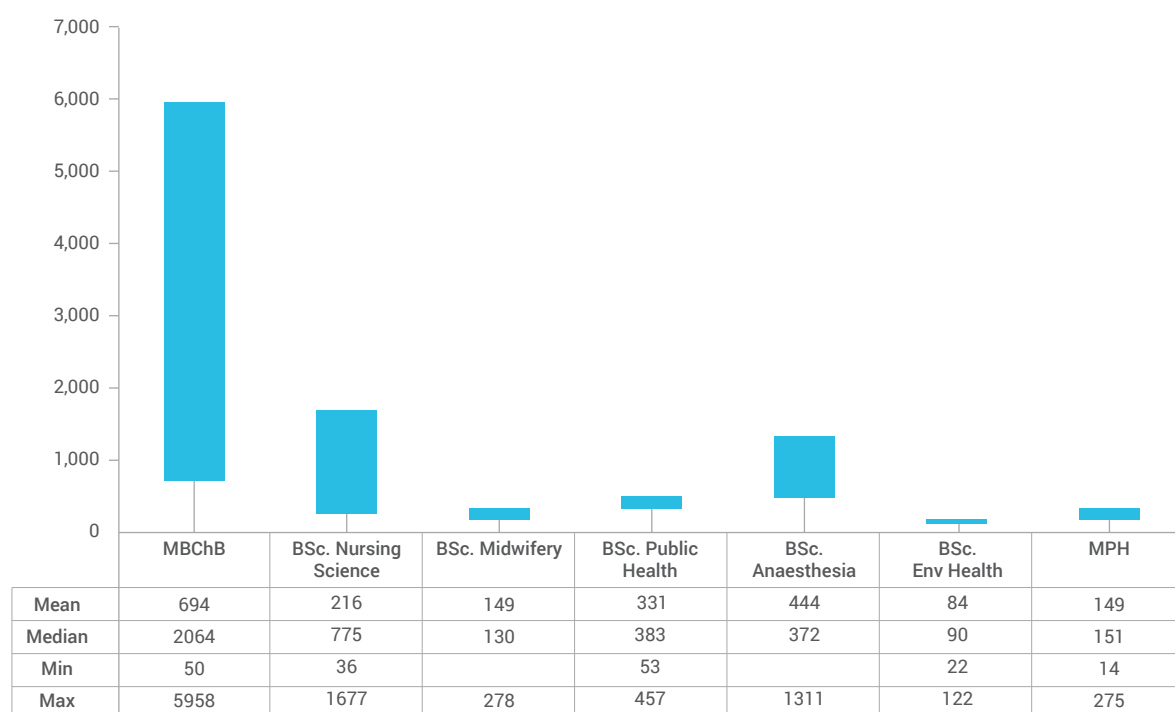*Figure 16: Admissions into select Bachelor and Masters' programs from 2021 to 2022.*

Sources: *Aga Khan University, Bishop Stuart University, Bugema University, Busiitema University, Cavendish University, Gulu University, Islamic University in Uganda, King Ceasor University, Makerere University, Mbarara University, Mountains of the Moon University, Muni University, Soroti University, Uganda Christian University and Victoria University.*

4.1.5 Graduation rates

The trend of number of students who graduated from certificate nursing and midwifery program from 2006 to 2022 shows a general increase despite a drop in 2012, Figure 17. High increase was observed for the certificate in nursing (CN) program which registered 6,790 graduates in 2022 from 550 in 2006. The second program to register high growth in number of graduates was certificate in midwifery (CM) which had 3,655 graduates in 2022. Certificate in mental health nursing (CMHN) has consistently had low number of graduates compared to the CM, CN and CCN programs.

The trends for graduation from diploma and advanced diploma nursing and midwifery programs during 2006 to 2022 period varied greatly among the selected programs assessed. Diploma in comprehensive nursing (DCN) was the only program that had graduates since 2006 as shown in Figure 18. However, the highest number of graduates as of year 2022 is for diploma in nursing programs which had 1,370 graduates seconded by diploma in midwifery program which recoded a total of 986. These trends are consistent with the enrolment and admissions trends. The number of graduates from advanced diploma in palliative care nursing (ADPCN), diploma in public health nursing (DPHN), and diploma in pediatrics and child health nursing (DPCHN) were less than 22 graduates.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Certificate in Midwifery (CM)	324	111	58	585	290	228	229	546	1,214	1,498	2,254	3,089	3,428	2,541	2,546	3,582	3,655
Certificate in Nursing (CN)	550	294	191	775	546	271	393	763	1,433	1,678	2,646	4,273	4,079	4,116	3,785	5,041	6,790
Certificate in Comprehensive Nursing (CCN	184	536	964	2478	1,971	2966	1073	2076	2,315	1,809	1,514	1,061	990	986	1,140	1,254	1,189
Certificate in Mental Health Nursing (CMHN)	49	53	100	167	207	123	124	109	92	91	208	98	79	84	169	163	110

Figure 17: Trends in graduation from certificate nursing and midwifery programs from 2006 to 2022.

Source*: Uganda Nurses and Midwives Examinations Board (UNMEB)*

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Diploma in Midwifery (DM)			212	21	788	239	258	268	429	329	562	666	665	730	137	786	986
Diploma in Nursing (DN)			268	65	985	349	304	401	467	669	767	1,162	823	1,285	225	1,321	1,370
Diploma in Comprehensive Nursing (DCN)	110	90	237	54	910	314	277	229	268	161	210	306	222	283	16	186	128
Diploma in Mental Health Nursing (DMHN)				5	76	40	39	47	58	72	47	69	49	61	29	71	51
Diploma in Paediatrics and Child Health Nursing (DPCHN)				1	19	14	1	6	4	3		2	4	10	2	4	21
Diploma in Public Health Nursing (DPHN)											16	17	14	2	1	5	14
Advance Diploma in Palliative acard Nursing (ADPCN)														6	13		

Figure 18: Trends in graduation from diploma and advanced diploma nursing and midwifery programs from 2006 to 2022.
Source: *Uganda Nurses and Midwives Examinations Board (UNMEB)*

Table 8 presents trends in graduation from allied health programs from 2018 to 2022 in Uganda. In general, there was an increase in the number of graduates from most of the allied health programs from 2018 to 2022. The highest number of graduates (2,229) was observed for graduates with Certificate in Medical Laboratory Techniques in 2022, representing 54% increase. The highest growth rate was observed in graduates with Diploma in Ophthalmic Clinical Medicine (1,250%), followed by graduates with certificate in medical records (550%) and Diploma in Health Promotion and Education (500%). On the contrary, the lowest growth rate was observed in graduates with Diploma in Environmental Health Sciences (-1%). Diploma in Psychiatric Clinical Medicine (Mental Health) (0%) and Diploma in Audiology (0%).

Table 8: Trends in graduation from allied health programs from 2018 to 2022

Programmes	Graduates Per Year				
	2018	2019	2020	2021	2022
Certificate in Medical Laboratory Techniques	1450	1496	2052	2032	2229
Certificate in Environmental Health Sciences	235	270	299	286	337
Certificate in Medical Theatre Techniques	104	170	226	210	252
Certificate in Medical Records	22	22	41	47	143
Certificate in Pharmacy		177	165	155	699
Diploma in Anesthesia	48	68	76	87	91
Diploma in Health leadership & Management	93	113	196	159	144
Diploma in Health Counselling & Social Care	0	0	0	0	0
Diploma in Health Promotion & Education	2	4	10	6	12
Diploma in Psychiatric Clinical Medicine (Mental Health)	2	2	2	1	2
Diploma in Ear, Nose, Throat & Neck Surgery (ENT)	2	3	1	2	5
Diploma in Ophthalmic Clinical Medicine	2	15	22	27	27
Diploma in Audiology	2	4	2	2	2
Diploma in Public Health Dentistry	71	101	142	128	138
Diploma in Medical Entomology & Parasitology	19	24	23	25	20
Diploma in Medical Radiography	20	16	39	37	46
Diploma in Occupational Therapy	17	19	24	24	15
Diploma in Orthopedic Medicine	52	60	70	116	69
Diploma in Orthopedic Technology	33	15	26	27	25
Diploma in Dental Technology	3	3	17	15	13
Diploma in Pharmacy	78	163	345	300	429
Diploma in Physiotherapy	13	6	33	30	35
Diploma in Environmental Health Sciences	130	150	132	136	161
Diploma in Medical Laboratory Technology	344	400	554	544	579
Diploma in Medical Records & Health Informatics	14	12	17	17	39
Diploma in Clinical Psychiatry	34	50	51	49	53
Diploma in Clinical & Community Nutrition	10	10	33	42	42
Diploma in Clinical Medicine & Community Health	698	936	1479	1490	1533
Diploma in Ophthalmic Clinical Medicine	15	17	25	21	38

Source: *Uganda Allied Health Examinations Board (UAHEB) 2023*

Figure 19 shows that a high number of students graduated in the MBChB program compared to other selected Bachelor and Masters' programs offered in 15 universities in Uganda during the 2021/2022 academic year with a mean of 262 graduates. Other programs which had a high mean of graduates were BSc in Nursing Program (156) and BSc in Public Health (136). The lowest mean of graduates was observed in the BSc in Anaesthesia program.
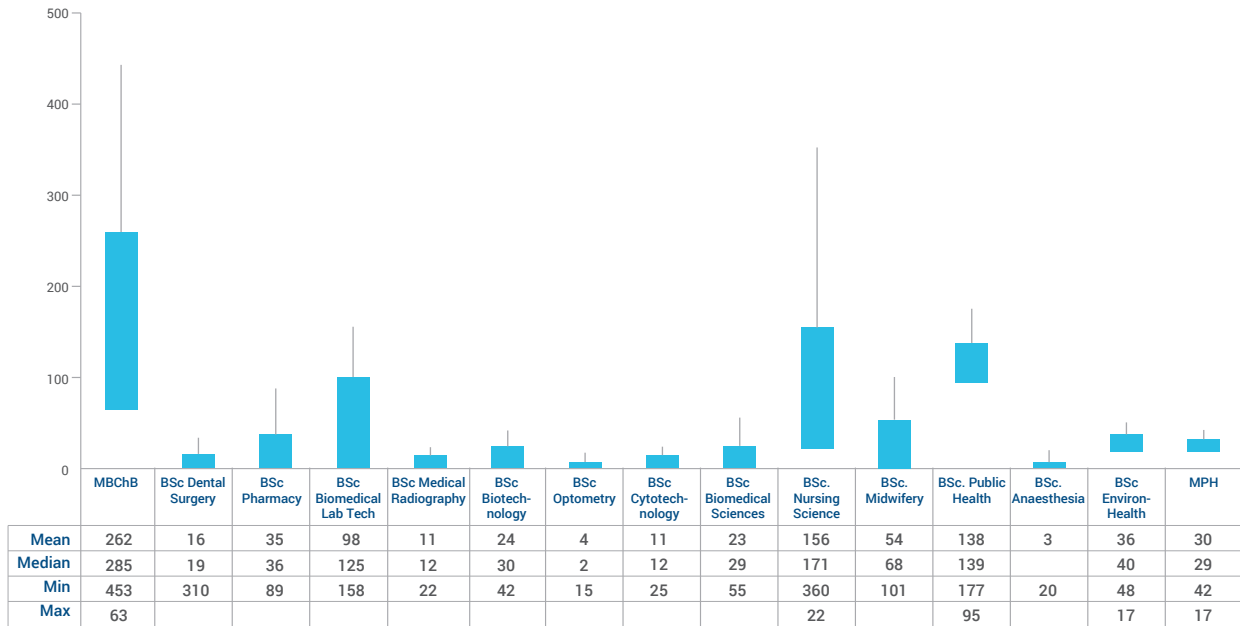
Figure 19: Graduation from select Bachelor and master's programs from 2021 to 2022.

	MBChB	BSc Dental Surgery	BSc Pharmacy	BSc Biomedical Lab Tech	BSc Medical Radiography	BSc Biotech-nology	BSc Optometry	BSc Cytotech-nology	BSc Biomedical Sciences	BSc. Nursing Science	BSc. Midwifery	BSc. Public Health	BSc. Anaesthesia	BSc Environ-Health	MPH
Mean	262	16	35	98	11	24	4	11	23	156	54	138	3	36	30
Median	285	19	36	125	12	30	2	12	29	171	68	139		40	29
Min	453	310	89	158	22	42	15	25	55	360	101	177	20	48	42
Max	63									22		95		17	17

Sources: *Aga Khan University, Bishop Stuart University, Bugema University, Busiitema University, Cavendish University, Gulu University, Islamic University in Uganda, King Ceasor University, Makerere University, Mbarara University, Mountains of the Moon University, Muni University, Soroti University, Uganda Christian University and Victoria University.*

4.2 ATTRACTIVENESS OF HEALTH PROFESSIONS PROGRAMMES

The analysis estimated the attractiveness (ratio of applications to training capacity) of selected health profession education programs in Uganda in 2022. This was estimated as a ratio of annual applicants to the available slots (the theoretical capacity). Results in Figure 20 shows that diploma in orthopaedic medicine program had the highest level of attractiveness with an average of 35 applicants competing for each available training slot, followed by diploma in dental technology with a ratio of 20 applications and diploma in orthopaedic technology with a ratio of 14 applications. Although these ratios demonstrate high level of attractiveness for the health professions programmes, it could also be indicative of a low training capacity for critical programmes with high demand. MBChB program had a ratio of 1:7 and BSc in Nursing Science program had a ratio of 1:4.

BOX 7

DEFINITION OF STOCK AND CALCULATION OF DENSITY

Stock refers to the total number of health workers who are qualified and registered to potentially work in Uganda. This includes those employed, unemployed but willing to take up employment, and those out of the labour force, i.e., those although qualified as health workers are not available or willing to work in their respective health professions.

Ascertaining those providing services to patients and communities, i.e., **practicing health workers** was only possible for the public health sector and the private not for profit.

Information on **professionally active health workers** was difficult to obtain due to difficulties in tracking health workers in other public sectors outside health.

Calculations for density was done using **health workers licensed to practice** which was obtained from the professional councils. The density was based on the absolute number of health workers available in Uganda relative to the total population at 2022 (per 10,000 population).
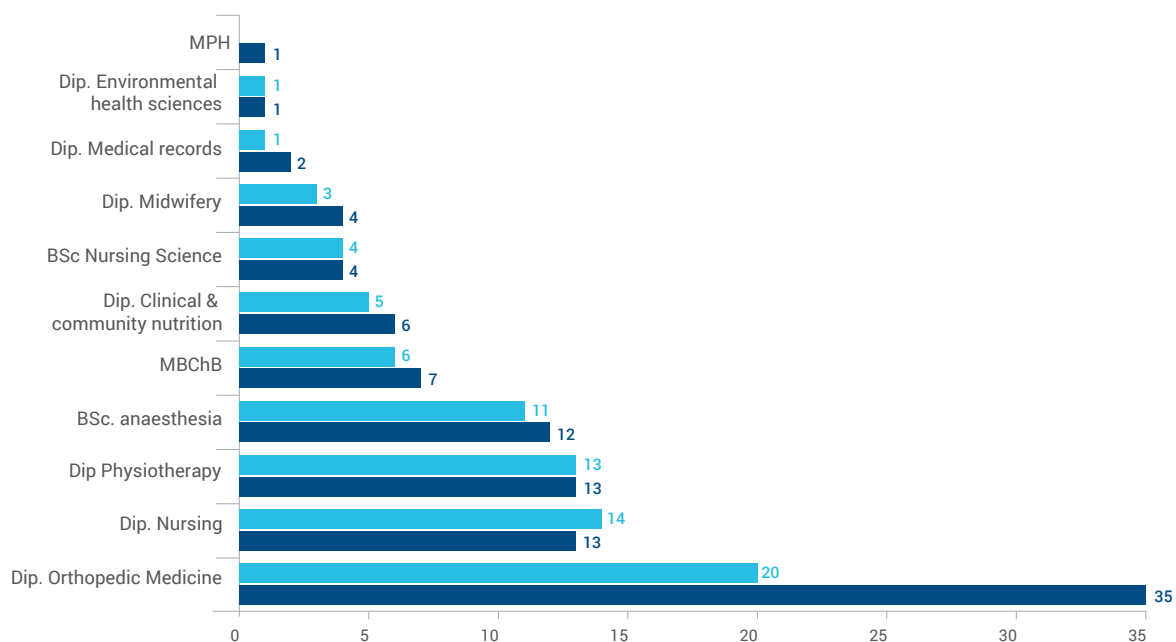
Figure 20: Attractiveness (ratio of applications to training capacity) for programs in Uganda Education market in 2022.

4.3 SUPPLY OF THE HEALTH WORKFORCE IN UGANDA

4.3.1 Current stock and density of health workers

The total stock of health workers in Uganda was estimated at 158,932 in 2022. Within the different cadres or categories of health workers, the highest stock reported were nurses and midwives (106,915), followed by laboratory technicians (16,098) and clinical officers (13,627). The nurses and midwives represent 67.3% of health workers, whilst laboratory technicians and clinical officers represent 10.1% and 8.6% of health workers, respectively. There were 7,793 (4.9%) medical doctors (general medical practitioners and specialists), 1,712 (1.1%) pharmacists and 504 dentists (0.3%) (Table 9).

The density of selected health workers by cadre shows that in Uganda in 2022, there were 1.77, 23.85, 3.08, 0.39 and 0.11 per 10,000 population of medical doctors, nursing and midwifery professionals, clinical officers, pharmacists, and dentists, respectively (**Table 9**).

Table 9: Current stock and density of health workers per 10,000 in Uganda, 2022

Occupation Title	Equivalent ISCO Classification	Stock of qualified health workers in 2022	Density per 10,000
Medical Doctors	**221 - Medical doctors**	**7,793**	**1.76**
General practitioners	2211 - Generalist medical practitioners	5,864	1.33
Physicians/ Internal medicine	2212 - Specialist medical practitioners	272	0.06
Obstetrics and Gynecology	2212 - Specialist medical practitioners	315	0.07
General Surgery	2212 - Specialist medical practitioners	216	0.05
Pediatricians	2212 - Specialist medical practitioners	273	0.06
Emergency medicine	2212 - Specialist medical practitioners	10	0.00
Family Medicine	2212 - Specialist medical practitioners	33	0.01

Occupation Title	Equivalent ISCO Classification	Stock of qualified health workers in 2022	Density per 10,000
Ear Nose and Throat Surgeons	2212 - Specialist medical practitioners	56	0.01
Orthopedic surgeons	2212 - Specialist medical practitioners	76	0.02
Ophthalmologists	2212 - Specialist medical practitioners	66	0.01
Pathologists	2212 - Specialist medical practitioners	58	0.01
Radiologists	2212 - Specialist medical practitioners	74	0.02
Microbiologists	2212 - Specialist medical practitioners	336	0.08
Psychiatrists	2212 - Specialist medical practitioners	59	0.01
Anesthesiologists	2212 - Specialist medical practitioners	85	0.02
Dental Surgeons	**2261 - Dentists**	**504**	**0.11**
Pharmacists	**2262 - Pharmacists**	**1,712**	**0.39**
Enrolled nurse	**3221 - Nursing associate professionals**	**52,049**	**11.77**
Enrolled midwife	**3222 - Midwifery associate professionals**	**24,259**	**5.49**
Nurses	2221 - Nursing professionals	21,907	4.62
Registered Nurse	**2221 - Nursing professionals**	**20,429**	**4.95**
Registered Pediatric Nurse	**2221 - Nursing professionals**	**182**	**0.04**
Registered Palliative Care Nurse	**2221 - Nursing professionals**	**9**	**0.00**
Registered Public Health Nurse	**2221 - Nursing professionals**	**186**	**0.04**
Registered Mental Health Nurse	**2221 - Nursing professionals**	**1,101**	**0.25**
Registered midwife	**2222 - Midwifery professionals**	**8,700**	**1.97**
Anesthetic Officer	**2269 - Health professionals not elsewhere classified**	**353**	**0.08**
Assistant Nutritionist	**2269 - Health professionals not elsewhere classified**	**17**	**0.00**
Chiropractor	**2269 - Health professionals not elsewhere classified**	**5**	**0.00**
Clinical Officers	2269 - Health professionals not elsewhere classified	13,627	3.08
Medical Clinical Officer	2269 - Health professionals not elsewhere classified	12,937	2.93
Ophthalmic Clinical Officer	2269 - Health professionals not elsewhere classified	264	0.06
Ear Nose and Throat Clinical Officer	2269 - Health professionals not elsewhere classified	426	0.10
Psychiatric Clinical Officer	**2269 - Health professionals not elsewhere classified**	**345**	**0.08**
Anesthetic Clinical Officer	**2269 - Health professionals not elsewhere classified**	**250**	**0.06**
Dispenser	**3213 - Pharmaceutical technicians and assistants**	**1,548**	**0.35**
Environmental Health Officer	**3257 - Environmental and occupational health inspectors and associates**	**426**	**0.10**
Health Assistant	**5321 - Health care assistants**	**2,633**	**0.60**
Health Inspector	**2269 - Health professionals not elsewhere classified**	**1,310**	**0.30**
Medical Imaging Technologist	**2269 - Health professionals not elsewhere classified**	**218**	**0.05**
Medical Laboratory Assistant	**3212 - Medical and pathology laboratory technicians**	**10,238**	**2.32**
Medical Laboratory Scientific Officer	**3212 - Medical and pathology laboratory technicians**	**658**	**0.15**
Medical Laboratory Technician	**3212 - Medical and pathology laboratory technicians**	**3,142**	**0.71**
Medical Laboratory Technologist	**3212 - Medical and pathology laboratory technicians**	**2,060**	**0.47**
Medical Radiographer	**3211 - Medical imaging and therapeutic equipment technicians**	**553**	**0.13**

Occupation Title	Equivalent ISCO Classification	Stock of qualified health workers in 2022	Density per 10,000
Medical Sonographer	3211 - Medical imaging and therapeutic equipment technicians	29	0.01
Nutritionist	2265 - Dieticians and nutritionists	76	0.02
Occupational Therapist	3257 - Environmental and occupational health inspectors and associates	229	0.05
Optometrist	2267 - Optometrists and ophthalmic opticians	19	0.00
Orthopedic Officer	2269 - Health professionals not elsewhere classified	890	0.20
Orthopedic Technologist	2269 - Health professionals not elsewhere classified	392	0.09
Pharmacy Assistant	3213 - Pharmaceutical technicians and assistants	199	0.05
Physiotherapist	2264 - Physiotherapists	417	0.09
Public Health Dental Officer	3251 - Dental assistants and therapists	1,084	0.25
Public Health Officer	2269 - Health professionals not elsewhere classified	96	0.02
Speech and Language Therapist	2266 - Audiologists and speech therapists	29	0.01
Theatre Assistant	3256 - Medical assistants	800	0.18
Vector Control Officer	2269 - Health professionals not elsewhere classified	365	0.08
Total		158,932	35.95

4.3.2 Trends in the stock of selected cadres of health workers in Uganda, 2012 – 2022

The stock of nurses, midwives, pharmacists, and doctors increased from the year 2012 to 2022. The proportion among the different cadres of health workers remained consistent, with the highest being for nurses. However, the highest growth rate was observed for midwives (211%), followed by nurses (184%), pharmacists (178%) and medical doctors (51%). Figure 21 presents the trends in the overall stock of nurses, midwives, pharmacists, and medical doctors between 2012 and 2022.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Nurses	25,756	29,201	33,354	37,120	42,073	46,561	51,662	57,427	60,491	69,235	73,169
Midwives	10,584	11,131	12,211	13,738	16,007	18,529	21,374	24,847	26,422	31,236	32,960
Pharmacists		615	682	759	856	979	1,118	1,229	1,347	1,488	1,712
Medical Doctors				5,159	5,563	5,966	6,528	7,107	7,540	7,633	7,793
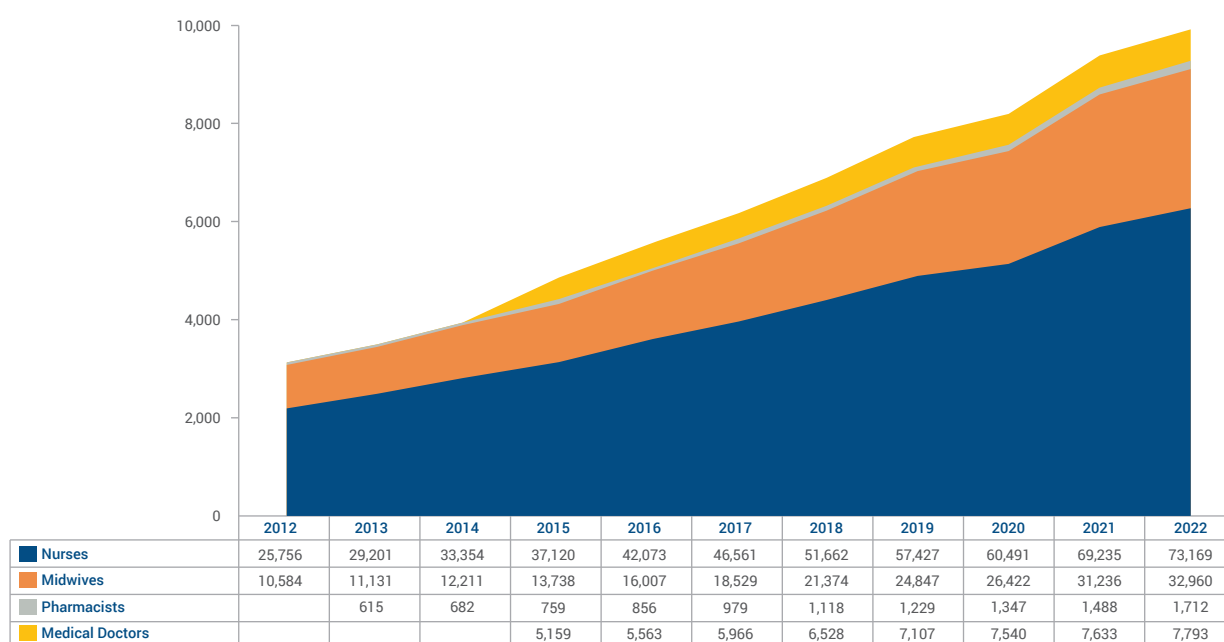
Figure 21: Trends in overall stock (registered) of nurses, midwives, pharmacists, and medical doctors 2012 – 2022.

Source: *UMDC, UNMC and UPC.*

REGULATION OF HEALTH WORKERS

A key finding was that the regulation of health workers needs to be improved. Evidence indicated that most practitioners do not renew their practice licenses, and this affected the ability to ascertain those providing services and in which sector they work in.

For medical doctors, the figure below shows the trends in annual practicing license renewals by medical doctors from 2015 to 2021. The stock of medical doctors increased constantly by 48% (from 5,159 to 7,633) between 2015 and 2021, and the number of doctors who renewed their professional license increased as well by 57% (from 3,041 to 4,781) from 2015 to 2019. However, from 2019 to 2020, the number of doctors who renewed their professional license dropped by -8% (from 4,781 to 4,476).

Trends in annual practicing license renewals by medical doctors, 2015 – 2021
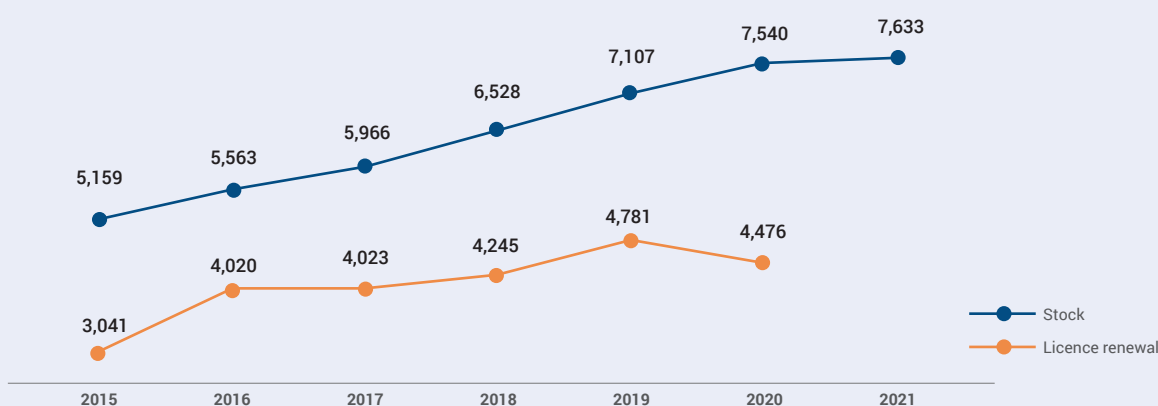
4.3.3 Health workforce distribution by sector of employment

Figure 22 shows that the majority of nursing professionals (74%), pharmacists (72%) and midwifery professionals (64%) were employed in the public sector, compared to 26%, 28% and 36% employed in the private sector, respectively. About 61% of medical doctors and specialists were employed in the private sector, whilst 39% were employed in the public sector. Only 30% of dental surgeons were employed in the public sector whilst 70% were employed in the private sector.
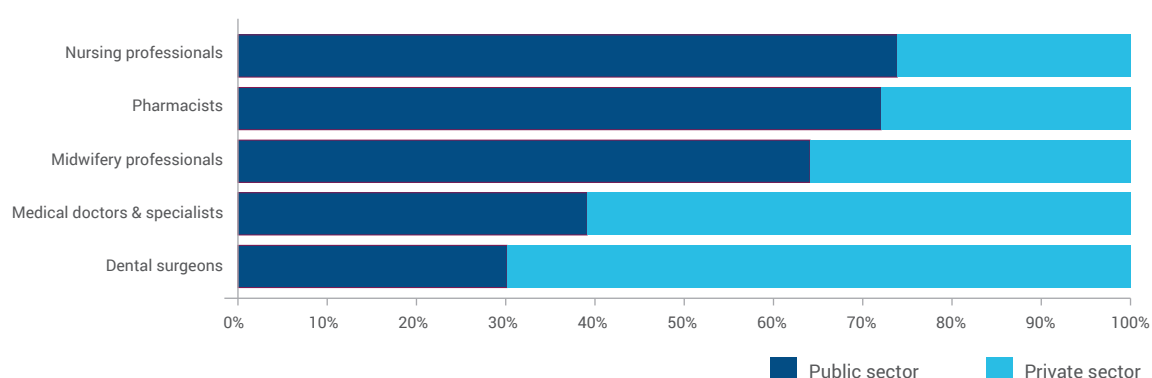
Figure 22: Health workforce distribution by sector of employment.

Source: *UMDC, UNMC and UPC*

The distribution of health workers in the Private-Not for Profit Hospitals in year 2022 showed that Catholic and Protestant medical bureau have more health workers compared to Orthodox and Muslim Medical Bureaus (Figure 23). The common cadres of health workers in these medical bureaus are the nurses, midwives, and doctors, respectively.
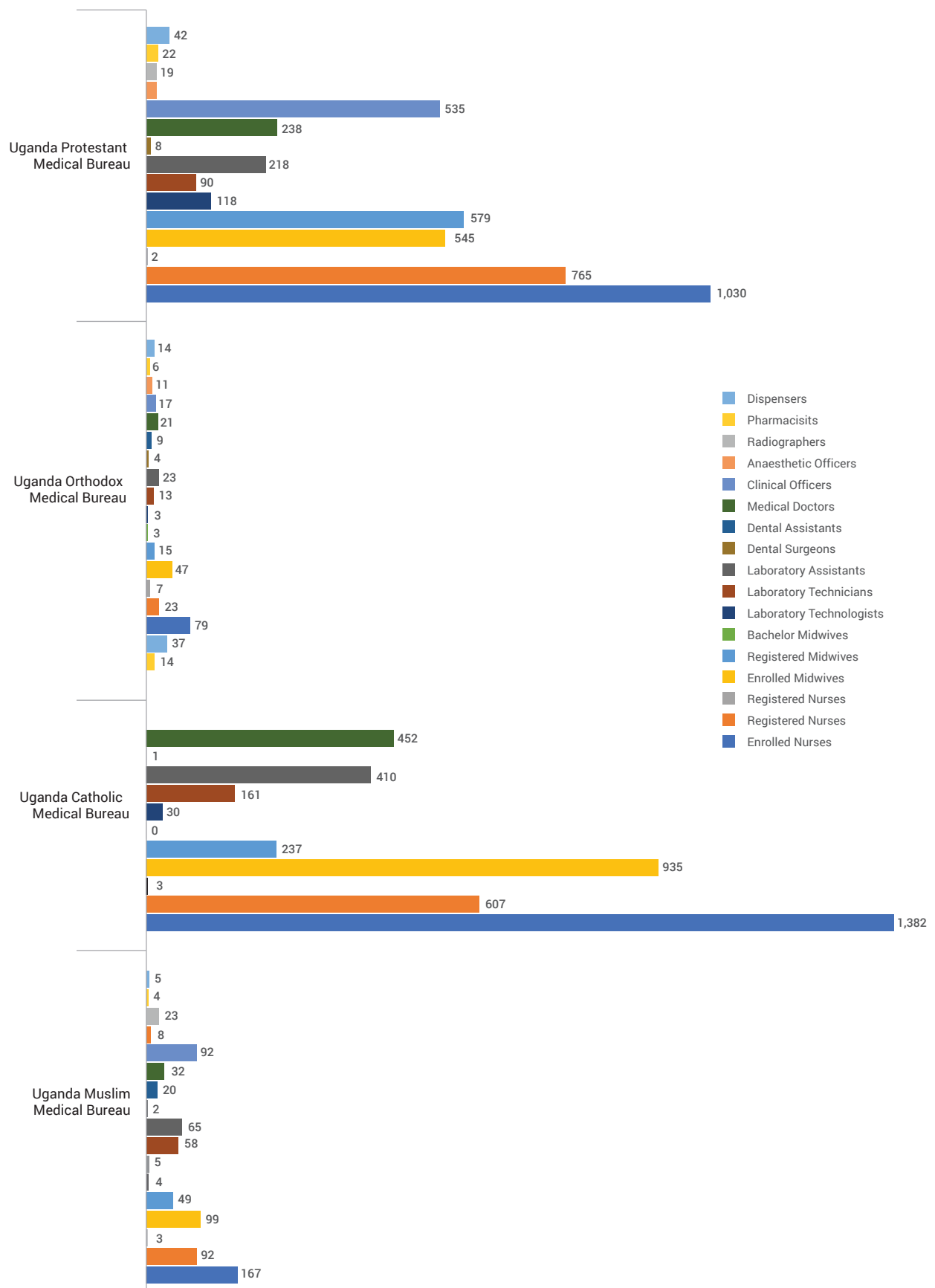
Figure 23: Distribution of health workers in the private-not for profit hospitals in Uganda in 2022
Source: *Uganda Medical Bureaus 2022*

Table 10 shows that out of the 7,793 medical doctors and specialists, 1,970 (25%) were employed in the public sector, whilst 3,058 (39%) were employed in the private sector and 2,780 (36%) were employed outside the health sector or unemployed[23]. For the nursing professionals, out of the 73,956 nurses, 18,687 (25%) were employed in the public sector, whilst 6,712 (9%) were employed in the private sector and 48,557 (66%) were employed outside the health sector or unemployed. The percentage of health workers employed outside the health sector or unemployed was highest for pharmacists (89%) and midwifery professionals (68%).

Table 10: Estimates of stock and effective supply of health workers in Uganda in 2022

| Occupation Title	Stock of qualified and registered health workers, (P)	Number Employed in Public Sector by GOVT (EnPb)	Number Employed in Public Sector by PEPFAR (EnPb)	Employed in Private Sectors (EnPr)	Employed in Private Not for Profit (EnPr)	Employed outside of Health (EnH) or Unemployed	% Employed in Public Sector	% Employed in Private Sector	% Employed outside of Health (EnH) or Unemployed
Medical Doctors and Specialists	7,793	1,770	200	2,315	743	2,765	25%	39%	35%
Nursing professionals	73,956	17,840	847	2,552	4,160	48,557	25%	9%	66%
Midwifery professionals	32,959	6,324	416	1,264	2,513	22,442	20%	11%	68%
Dental Surgeons	504	65		137	15	287	13%	30%	57%
Pharmacists	1,712	109	25	6	46	1,526	8%	3%	89%

Sources: *Professional Councils 20222; HRH Audit Report 2022; US Government PEPFAR Inventory Tool - December 2022; Professional Councils 2022; PNFP 2022*

The highest employment rate[24] for selected health workers in the health sector in Uganda in 2022 was observed for medical doctors and specialist at almost about 65%, whilst pharmacists had the lowest employment rate of about 10% (Figure 24).
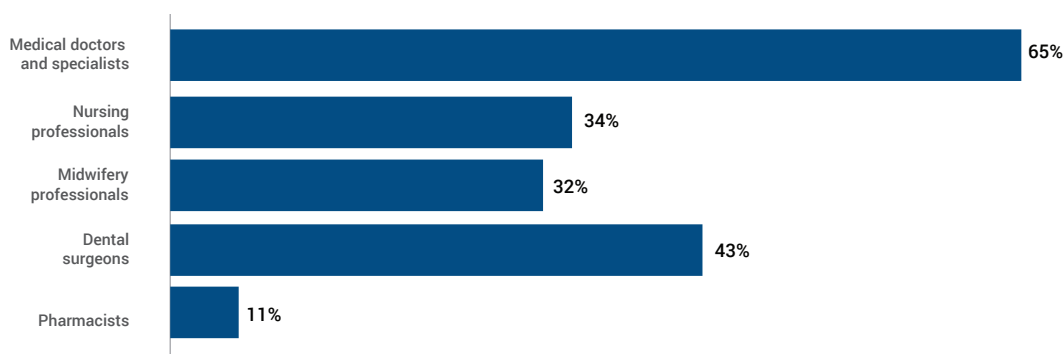
Figure 24: Estimated employment rate in the health sector for selected health workers, 2022.

4.3.4 Trends in the density of health workforce in Uganda, 2005−2022

The overall density of all doctors, nurses, and midwives was 25.9 per 10,000 population in 2022 and this is lower than the Sustainable Development Goals (SDG) density threshold of 44.50 per 10,000 population goal set in the Global Strategy for HRH: Workforce, 2030[25]. Figure 25 shows that the density of doctors, nurses and midwives has increased significantly from 14.7 to 25.9 per 10,000 population over the last 17 years (2005 − 2022) representing 76% increase. By 2021, Uganda also met the threshold for having at least 80% coverage of skilled birth attendance − a key target during the Millenium Development Goals (MDG) era. In the context of the SDGs, Uganda in 2022 had 58% of the 44.5 doctors, nurses, and midwives per 10 000 population SDG threshold indicator, falling short of the 2030 target by 42%.

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23 The lack of an information system to track those employed outside of health sector and unemployed hampered the calculation of unemployment rate which is critical for policy making and planning.
24 Employment Rate = (Number of Employed / Total Stock) * 100
25 https://www.who.int/publications/i/item/9789241511131
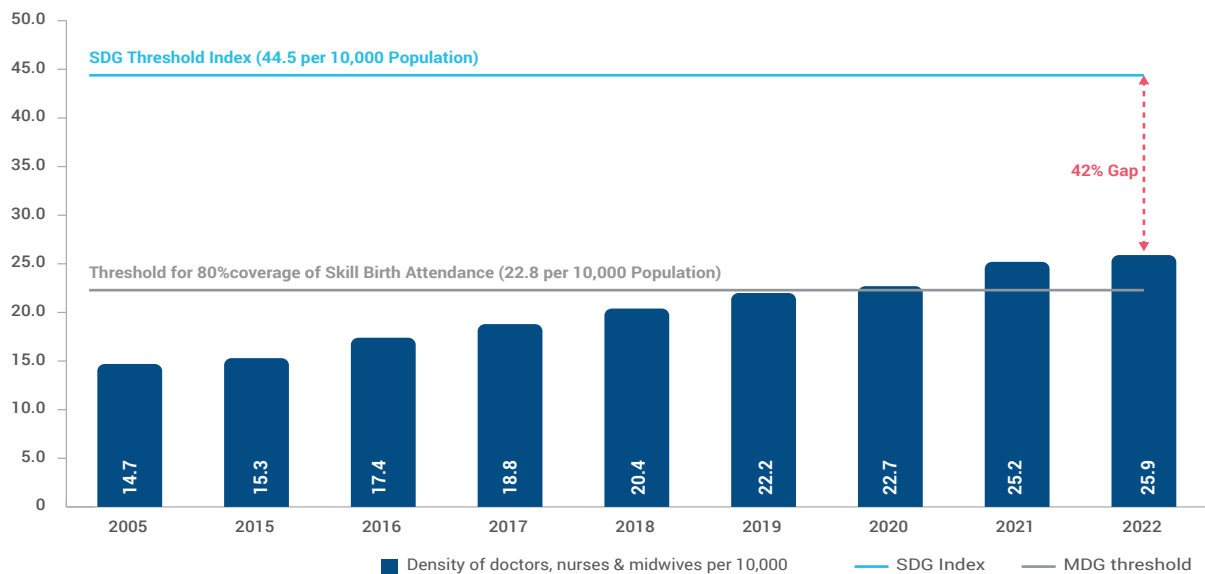
Figure 25: Trends in the density of doctors, nurses, and midwives per 10,000 population, 2005 – 2022.

4.3.5 Characteristics of the current stock of the health workforce

4.3.5.1 Age distribution of health workers

Uganda has a young health workforce with most health workers aged below 45 years (Figure 24). Most of the health workers are in the age range of 25 to 34 years seconded by those in the age range of between 35 and 44 years. In isolated health workforce cadres such as Anesthetic Officers and Health Inspectors, a majority are in the age group of 35 and 44 years and 45 and 54 years. The old health workers of above 65+ years are mostly those working as Dental Surgeons.
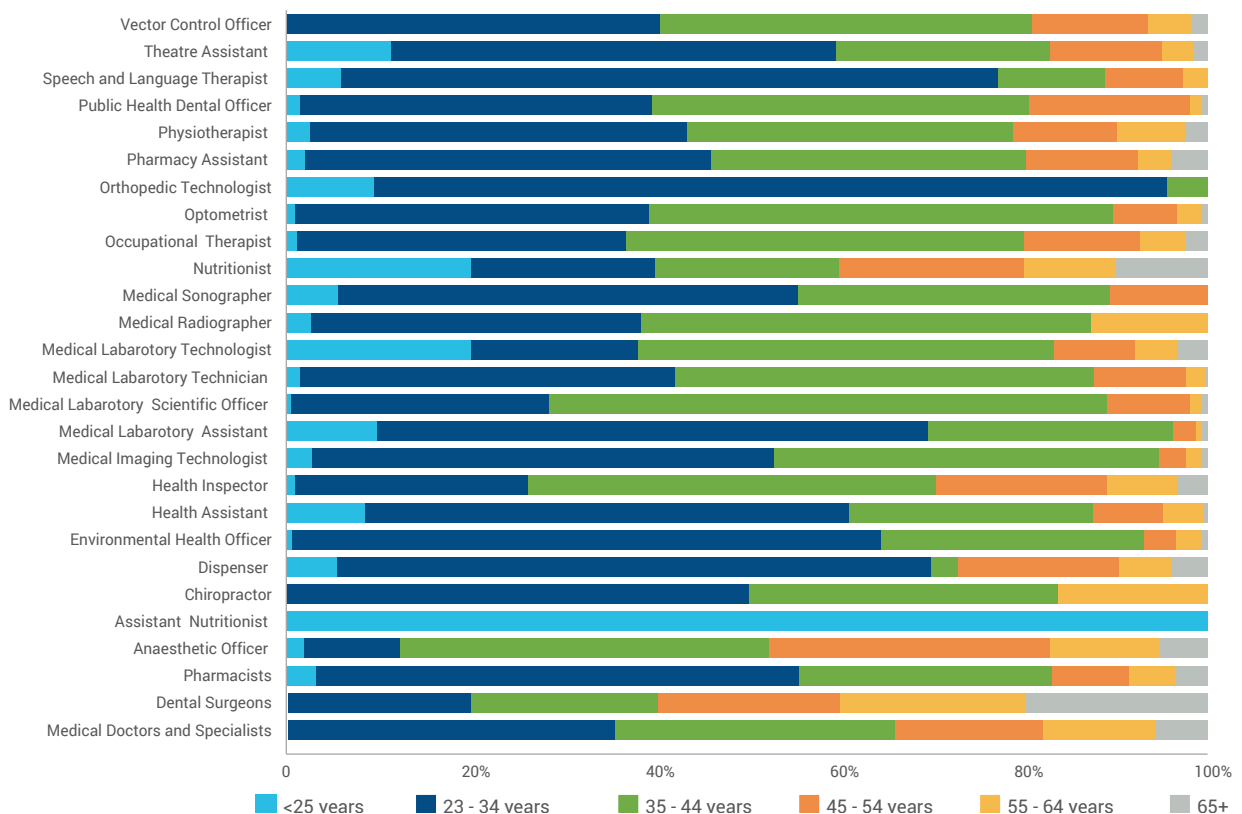
Overall, the majority of medical specialists were young in the age group of 24-34 years, and on average approximately 35% were aged below 35 years and second in majority are the medical specialist of the years between 35 and 44 years, around 30%. On the contrary, less than 10% of medical doctors and specialist were above 65 years.
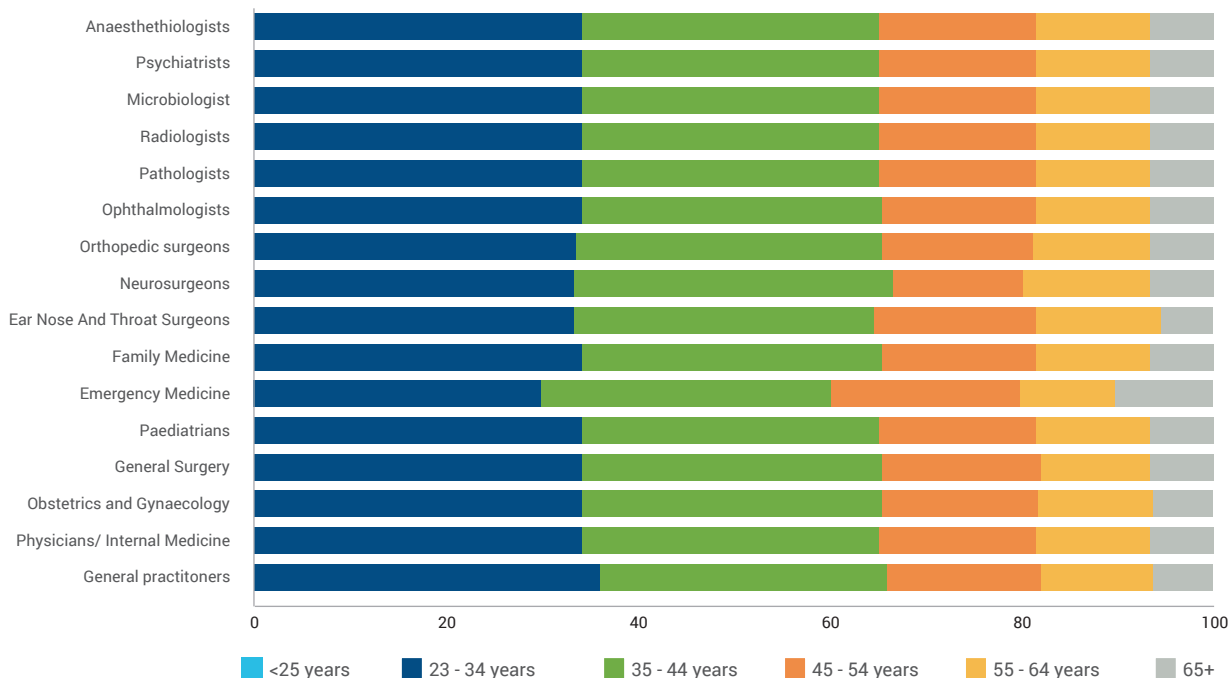
Figure 27: Age distribution of medical specialists.

Figure 28 shows the age distribution of nursing and midwifery professionals. Results show enrolled midwife, registered palliative care nurse, and enrolled nurse were mostly of the age in the range of 25 to 34 years. Registered midwife and nurses had similar proportion of health workers in the age group of 25 to 34 years and 35 to 44 years. Older health workers of above 65 years were mostly registered public health and pediatric nurses.
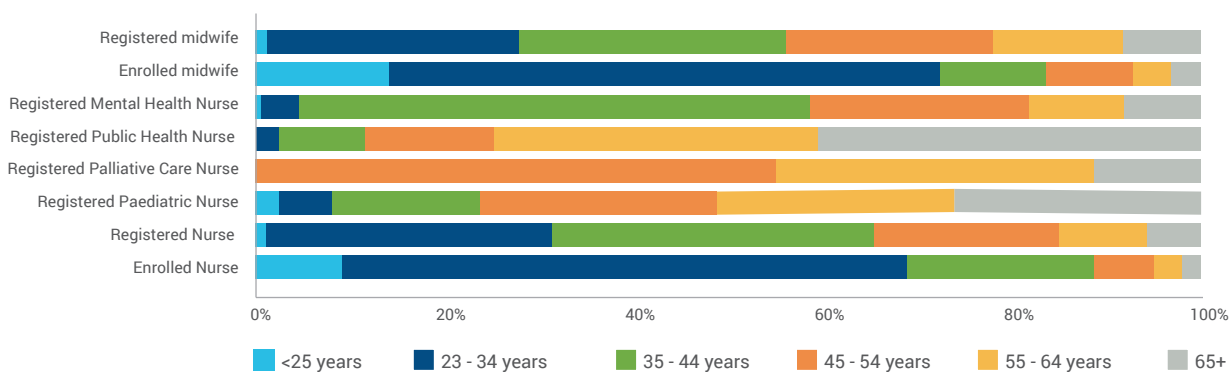
Figure 28: Age distribution of nursing and midwifery professionals.

4.3.5.2 Gender distribution of health workers

Figure 29 shows that averagely, a higher proportion of health workers were males (68%). The Medical Imaging Technologist profession had the highest proportion (83%) of male health workers. Medical doctors and specialists had about 74% males and 26% females. Fifty percent of Pharmacy Assistants were either male or females. Nurses and midwives had higher proportion of females at 67% and 100% respectively.

Source: *UMDC, UNMC, UPC, UAHC*
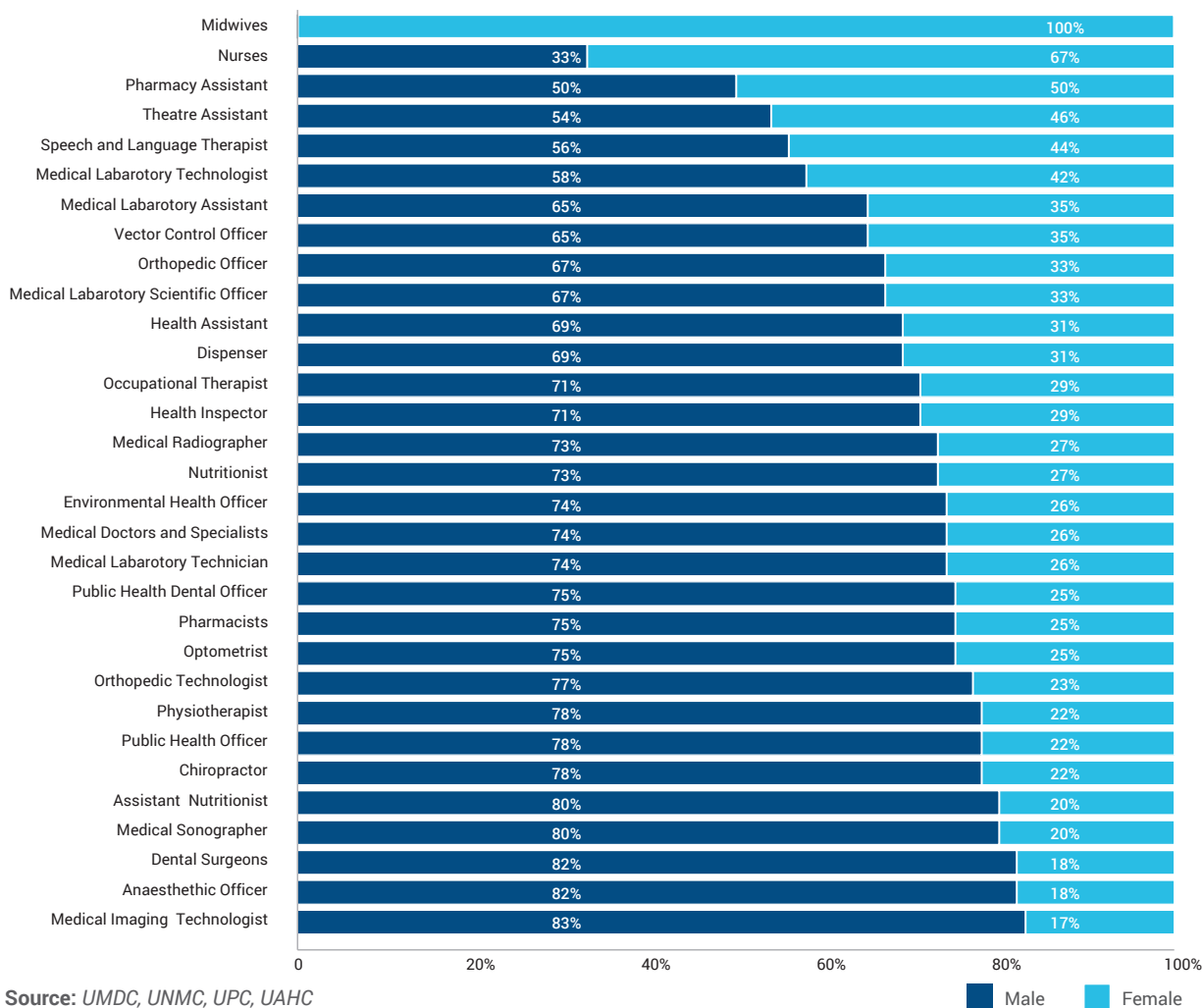
Figure 29: Gender distribution of health workers in Uganda, 2022

The gender distribution of medical specialists shows that there were generally more males (approx. on average 70%) compared to women (approximately on average 30%), as shown in Figure 30.

Source: *UMDC 2022*
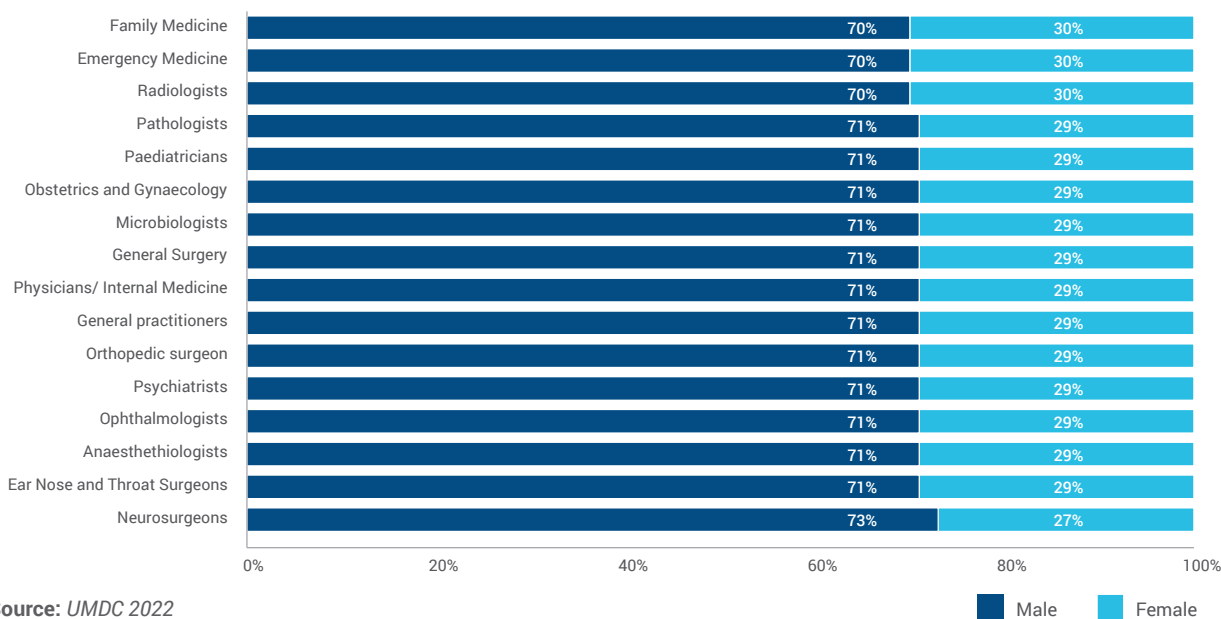
Figure 30: Gender distribution of medical specialists in Uganda, 2022

Majority of nursing and midwifery professionals were females. All enrolled midwives were female and almost 99% of registered midwives were females. About 73% of registered and 66% of enrolled nurses were females. On the contrary, most of registered mental health nurses (99%) and registered palliative care nurses were males (67%), as shown in Figure 31.
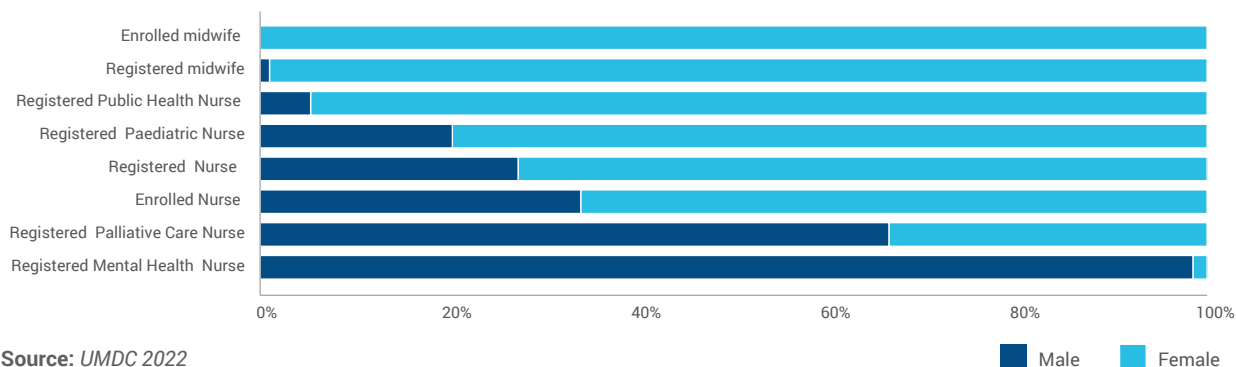
Source: *UMDC 2022*

Figure 31: Gender distribution of nursing and midwifery professionals in Uganda, 2022

4.3.5.3 Distribution of the health workforce by place of training

Figure 32 shows that overall, majority of the health workforce were trained in Uganda. Foreign trained health workers practicing in Uganda were mostly chiropractors (40%), optometrists (16%), medical doctors and specialists (8%), and physiotherapists (5%). The proportion of foreign trained health workers was less than 3% for those working as occupational therapists, dental surgeons, medical imaging technologists, medical laboratory technologists and pharmacists.
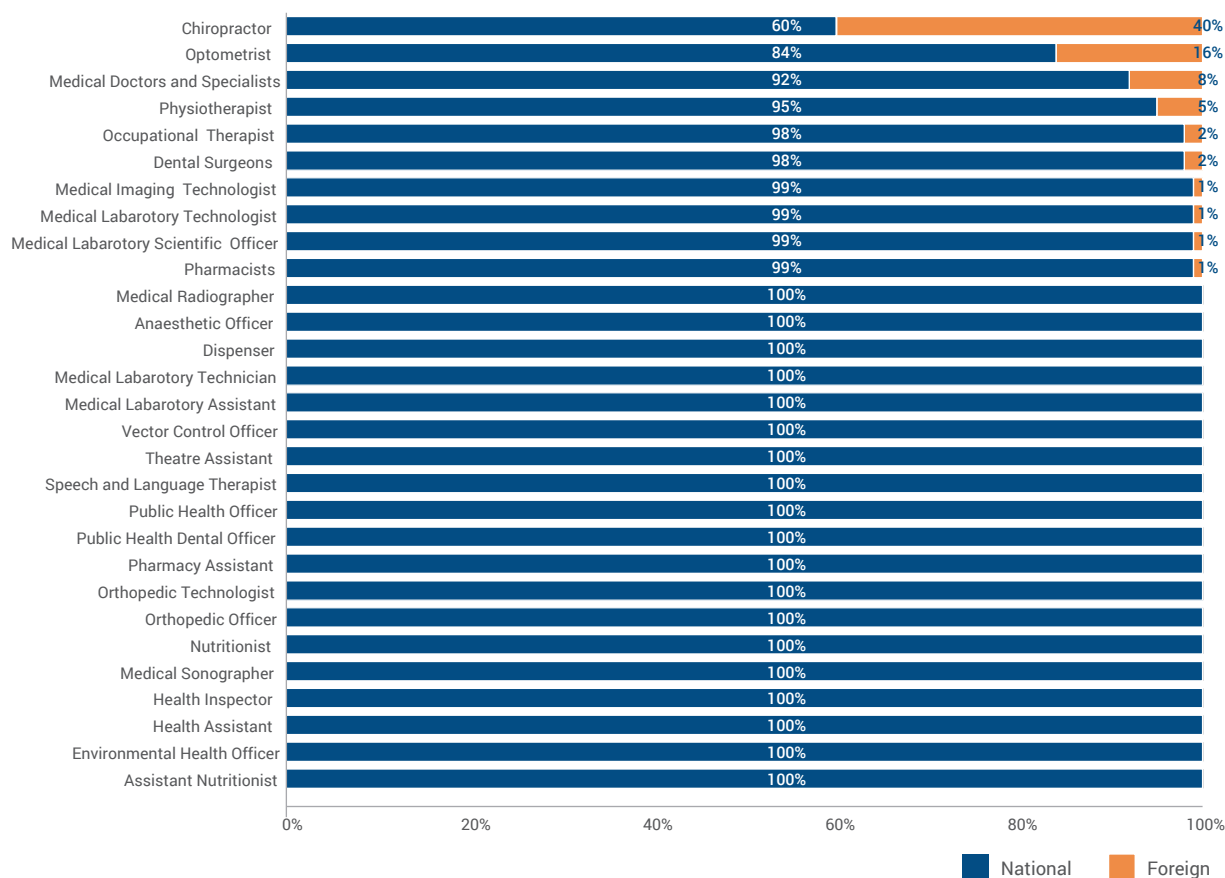
Figure 32: Distribution of the health workforce by country of training.

The distribution of medical specialists by country of training shows that the majority were trained in Uganda. All the health workers in the profession of Psychiatry were trained in Uganda. Most of the foreign trained specialists are neurosurgeons (29%), ophthalmologists (18%), anesthesiologists (17%), orthopedic surgeons (15%) and general surgeons (11%), as shown in Figure 33.
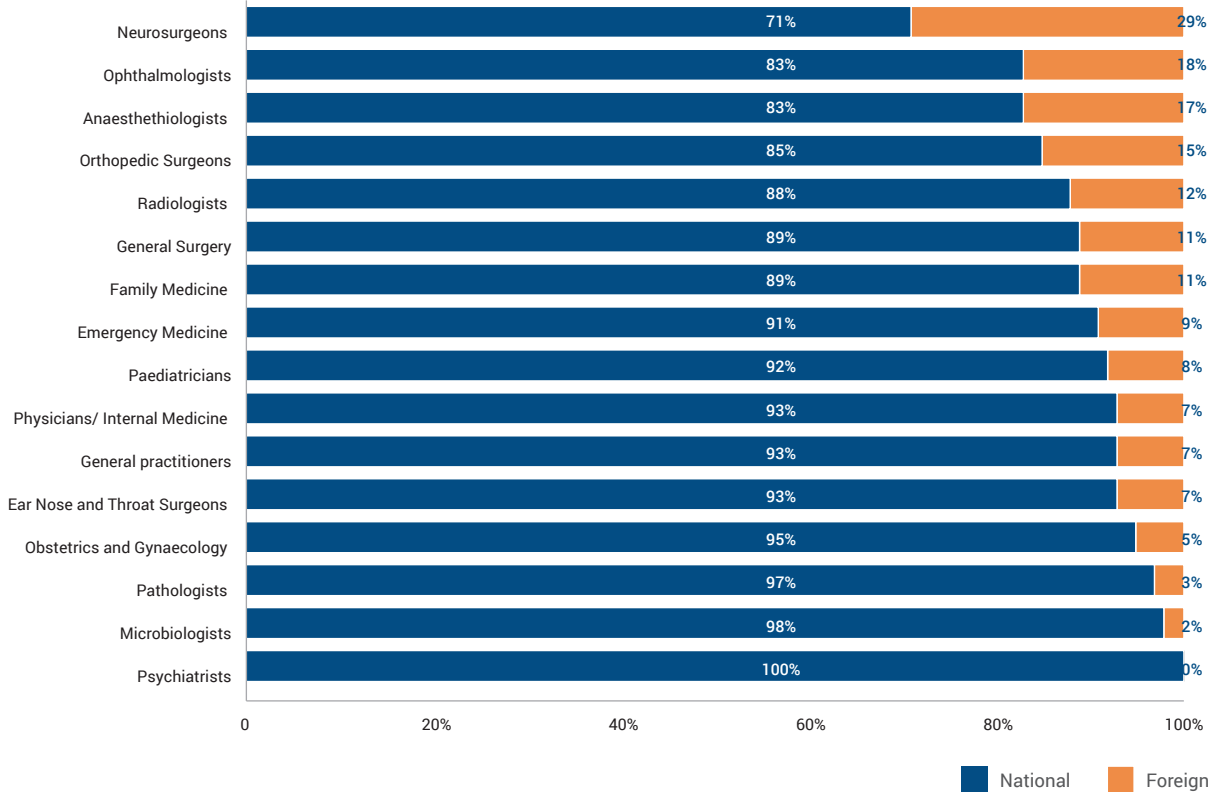
Figure 33: Distribution of medical specialists by country of training.

Majority of nursing and midwifery professionals were trained in Uganda. However, about 9% of registered pediatric nurses, 3% of registered public health nurses and 3% of registered nurse were trained outside Uganda, as shown in Figure 32.
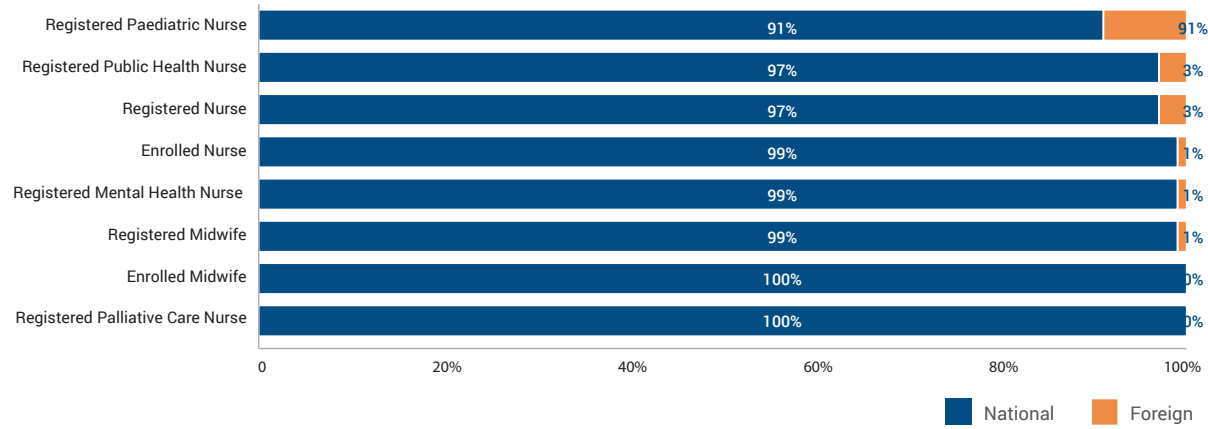
Figure 34: Distribution of nursing and midwifery professionals by country of training.

4.3.6 Geographic distribution of health workers: equity implications

The HRH Geographical Equity Index (GEI) approach, whereby the district's percentage share of national population as a denominator and their respective percentage share of the public service health workforce as a numerator, was used to assess equity.[26] The resultant density per 10,000 for Uganda is presented in Figure 35.

Kampala had the highest density for doctors, nurses, and midwives with a GEI of 41.2. They are closely followed by Moroto with GEI of 18.1, Butambala with GEI of 11.5, Kabale with GEI of 11.2 and Lyantonde with GEI of 9.1. Conversely, Kibaale (GEI - 0.8), Buyende (GEI - 0.8), Kyenjojo (GEI - 0.7), Kakumiro (GEI - 0.7) and Kyegegwa (GEI - 0.6) had the lowest index.

The GEI for Doctors was lowest in Kyegegwa district which had a GEI of 0.02, with Nwoya, Kole and Kyankwanzi districts having a GEI of 0.03. The highest ratio for doctors was in Kampala with a GEI of 8.8 and Moroto with a GEI of 4.8.

Similar to the instance for doctors, Kampala and Moroto had the highest GEI scores for nurses and midwives at 32.4 and 13.3 respectively. The lowest GEI scores were recorded for Kasanda, Wakiso, Kaliro and Kagadi districts at 0.9, Kole and Bukedea districts at 0.8, Buyende and Kyenjojo districts at 0.7, and Kakumiro, Kyegegwa and Kibaale districts at 0.6.

For pharmacists, only 30 districts had this cadre available with Kampala and Moroto having the highest GEI scores at 0.5 and 0.2. All districts had a medical laboratory professional cadre with the Kalangala and Kasese districts having the highest GEI score at 2.6, and Moroto district having a GEI score of 2.3. Twenty-three (23) districts had an anesthetic officer in place with the highest GEI score being evident in Kamapala at 0.3. Eleven districts (Mbarara, Moroto, Kabale, Kapchorwa, Jinja, Gulu, Kabarole, Masaka, Kiboga, Soroti and Hoima) had a GEI score of 0.1.

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26   MOHS; FMOH; MOH, Health Labour Market Analysis Report for Lesotho; MOH, Health Labour Market Analysis Report for Rwanda; MOHSS; Asamani and others, 'The Cost of Health Workforce Gaps and Inequitable Distribution in the Ghana Health Service'.
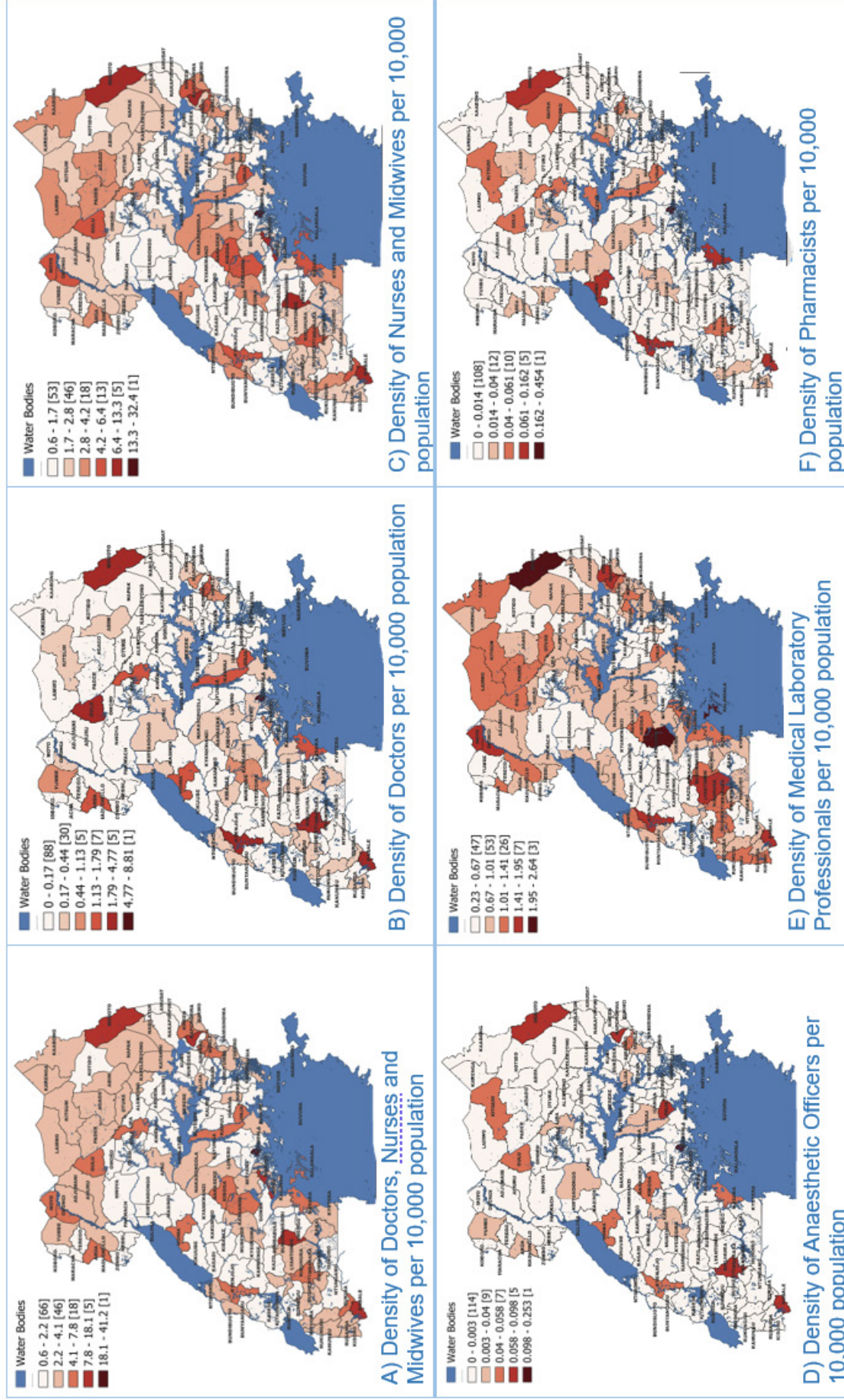
Figure 35. *Equity heatmaps for distribution of selected public sector health workers in Uganda, 2022*

Source: *HRH data from MOH payroll and population data from UBOS.*

4.3.7 Health workforce regulation and migration

4.3.7.1 Regulation of the Health Workforce

There are four regulatory bodies for health workers in Uganda namely the Uganda Medical and Dental Practitioners' Council; Uganda Nurses and Midwives Council; and the Uganda Allied Health Professional Council, see Table 11. The medical doctors and dental surgeons are regulated by Medical and Dental Practitioners' Council, pharmacists are regulated by Pharmacy Board, enrolled nurses and midwives and registered nurses and midwives are all regulated by Uganda nurses and midwives Council. With the exception of the first-degree social workers and epidemiologist which are not regulated, the rest of the occupations in Uganda are regulated by Uganda Allied Health Professional Council.

Table 11: Regulation of the health workforce in Uganda

Occupation Title used in the Country	Equivalent ISCO Classification	Status of regulation	Name of Regulatory Body
Medical Doctors	221 - Medical doctors	Regulated	Medical and Dental Practitioners' Council
General practitioners	2211 - Generalist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Physicians/ Internal medicine	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Obstetrics and Gynecology	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
General Surgery	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Pediatricians	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Emergency medicine	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Family Medicine	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Ear Nose and Throat Surgeons	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Neurosurgeons	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Orthopedic surgeons	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Ophthalmologists	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Pathologists	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Radiologists	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Microbiologist	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Psychiatrists	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Anesthesiologists	2212 - Specialist medical practitioners	Regulated	Medical and Dental Practitioners' Council
Dental Surgeons	2261 - Dentists	Regulated	Medical and Dental Practitioners' Council

Occupation Title used in the Country	Equivalent ISCO Classification	Status of regulation	Name of Regulatory Body
Pharmacists	2262 - Pharmacists	Regulated	Pharmacy Board
Enrolled nurse	3221 - Nursing associate professionals	Regulated	Uganda Nurses and Midwives Council
Enrolled midwife	3222 - Midwifery associate professionals	Regulated	Uganda Nurses and Midwives Council
Registered Nurse	2221 - Nursing professionals	Regulated	Uganda Nurses and Midwives Council
Registered Pediatric Nurse	2221 - Nursing professionals	Regulated	Uganda Nurses and Midwives Council
Registered Palliative Care Nurse	2221 - Nursing professionals	Regulated	Uganda Nurses and Midwives Council
Registered Public Health Nurse	2221 - Nursing professionals	Regulated	Uganda Nurses and Midwives Council
Registered Mental Health Nurse	2221 - Nursing professionals	Regulated	Uganda Nurses and Midwives Council
Registered midwife	2222 - Midwifery professionals	Regulated	Uganda Nurses and Midwives Council
Anesthetic Officer	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Assistant Nutritionist	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Chiropractor	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Medical Clinical Officer	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Ophthalmic Clinical Officer	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Ear Nose and Throat Clinical Officer	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Psychiatric Clinical Officer	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Anesthetic Clinical Officer	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Dispenser	3213 - Pharmaceutical technicians and assistants	Regulated	Allied Health Professional Council
Environmental Health Officer	3257 - Environmental and occupational healthinspectors and associates	Regulated	Allied Health Professional Council
Health Assistant	5321 - Health care assistants	Regulated	Allied Health Professional Council
Health Inspector	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Medical Imaging Technologist	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Medical Laboratory Assistant	3212 - Medical and pathology laboratory technicians	Regulated	Allied Health Professional Council
Medical Laboratory Scientific Officer	3212 - Medical and pathology laboratory technicians	Regulated	Allied Health Professional Council
Medical Laboratory Technician	3212 - Medical and pathology laboratory technicians	Regulated	Allied Health Professional Council
Medical Laboratory Technologist	3212 - Medical and pathology laboratory technicians	Regulated	Allied Health Professional Council
Medical Radiographer	3211 - Medical imaging and therapeutic equipment technicians	Regulated	Allied Health Professional Council

Occupation Title used in the Country	Equivalent ISCO Classification	Status of regulation	Name of Regulatory Body
Medical Sonographer	3211 - Medical imaging and therapeutic equipmenttechnicians	Regulated	Allied Health Professional Council
Nutritionist	2265 - Dieticians and nutritionists	Regulated	Allied Health Professional Council
Occupational Therapist	3257 - Environmental and occupational health inspectors and associates	Regulated	Allied Health Professional Council
Optometrist	2267 - Optometrists and ophthalmic opticians	Regulated	Allied Health Professional Council
Orthopedic Officer	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Orthopedic Technologist	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Pharmacy Assistant	3213 - Pharmaceutical technicians and assistants	Regulated	Allied Health Professional Council
Physiotherapist	2264 - Physiotherapists	Regulated	Allied Health Professional Council
Public Health Dental Officer	3251 - Dental assistants and therapists	Regulated	Allied Health Professional Council
Public Health Officer	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Speech and Language Therapist	2266 - Audiologists and speech therapists	Regulated	Allied Health Professional Council
Theatre Assistant	3256 - Medical assistants	Regulated	Allied Health Professional Council
Vector Control Officer	2269 - Health professionals not elsewhere classified	Regulated	Allied Health Professional Council
Social Workers	2635 - Social work and counselling professionals	Not regulated	Not regulated
Epidemiologist	2269 - Health professionals not elsewhere classified	Not regulated	Not regulated

4.3.7.2 Migration of health workers

Figure 36 shows the trend of doctors requesting certificates of good standing for emigration and the country of destination. Overall, the number increased by 97% within a 5-year period from 2014 to 2019. However, there were variations in the trends, for instance from 2014 to 2016, the number of health workers requesting for certificate of good standing for emigration by doctors increased steadily from 104 to 192 (85% increase). In 2017 the number dropped to 177 before it increased again to 226 in 2018 then dropped to 205 in 2019. Majority of doctors were requesting for certificates of good standing to migrate to Seychelles and seconded by seven other countries (Ethiopia, Germany, New Zealand, Rwanda, Saudi Arabia, Sierra Leone, and South Africa). There are also other 21 countries where the doctors do migrate to from Uganda as per 2019 records of requests for certificate of good standing for emigration.
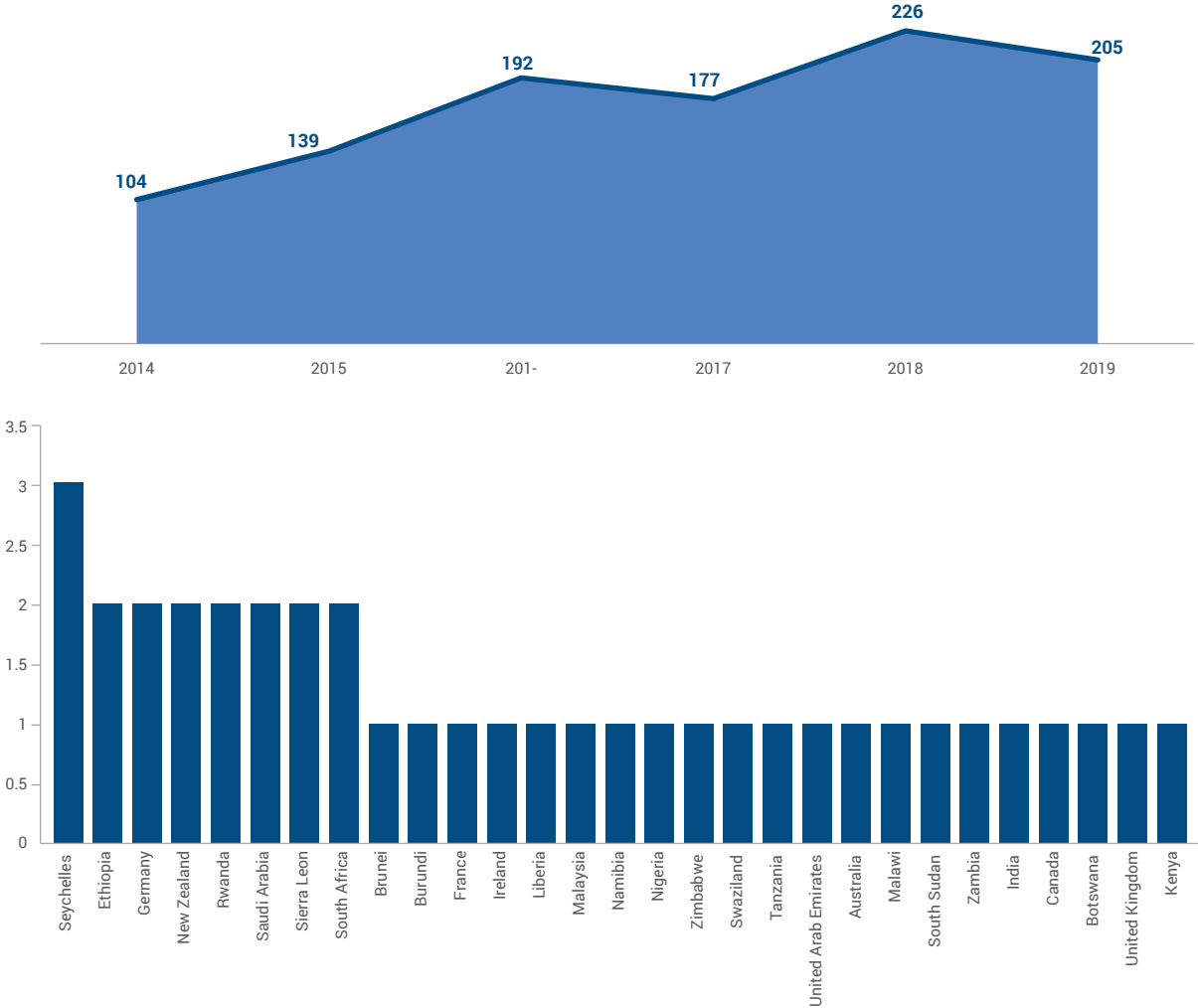
Figure 36: Trends in requests for certificate of good standing for emigration by doctors and country of destination, 2019.

SECTION 05
Predictive Labour Market Analysis

5.1. PROJECTED SUPPLY OF HEALTH WORKFORCE IN UGANDA, 2022 TO 2032

Based on the current supply and production rate of health workers in Uganda, the estimated supply of health workers in 2022 was 154,073 health workers across the 49 staff categories included in this analysis. If the current production capacity is maintained at average capacity and attrition (4%) is sustained, the supply is anticipated to increase by 45.2% (85,623) to 239,696 by 2032 (Figure 37).

Average training capacity

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Other health Professionals	17,420	18,480	19,497	20,473	21,411	22,311	23,172	24,004	24,800	25,565	26,299
Medical Imaging and therapeutic equipment technicians	800	816	831	845	859	872	885	897	909	920	931
Medical and pathology laboratory technicians	16,098	17,928	19,684	21,370	22,989	24,543	26,032	27,467	28,842	30,162	31,429
Dentists and Dental Assistants and therapists	1,588	1,664	1,737	1,807	1,874	1,939	2,001	2,060	2,117	2,172	2,225
Pharmacists and pharmaceutical technicians and Assistants	3,459	3,823	4,172	4,507	4,829	5,138	5,435	5,720	5,993	6,256	6,508
Midwifery Professionals	32,959	35,442	37,827	40,115	42,313	44,422	46,447	48,391	50,257	52,049	53,768
Nursing Professionals	73,956	78,198	82,271	86,161	89,934	93,537	96,996	100,317	103,505	106,565	109,503
Generalist and specialist Medical practitinoners	7,793	7,941	8,083	8,219	8,350	8476	8,596	8,713	8,824	8,930	9,033

Figure 37: Aggregate supply (current scenario of attrition and assuming average production from training institutions), 2022–2032.

However, if the production capacity is at a maximum and attrition is maintained at 4%, the supply is anticipated to increase by 63.7% (131,225) to 285,298 by 2032 (Figure 38).

Maximum training capacity

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Other health Professionals	17,420	18,974	20,466	21,899	23,274	24,594	25,861	27078	28,245	29,367	30,443
Medical Imaging and therapeutic equipment technicians	800	836	871	904	936	966	996	1,024	1,051	1,077	1,102
Medical and pathology laboratory technicians	16,098	18,420	20,649	22,789	24,844	26,816	28,709	30,527	32,272	33,947	35,555
Dentists and Dental Assistants and therapists	1,588	1,697	1,803	1,903	2,000	2093	2,183	2,268	2,351	2,430	2,305
Pharmacists and pharmaceutical technicians and Assistants	3,459	4,449	5,399	6,311	7,186	8027	8,834	9,608	10,352	11,066	11,751
Midwifery Professionals	32,959	36,282	39,471	42,534	45,473	48,295	51,004	53,605	56,102	58,499	60,800
Nursing Professionals	73,956	80,771	87,313	93,593	99,623	105,411	110,967	116,302	121,423	126,339	131,058
Generalist and specialist Medical practitinoners	7,793	8,305	8,797	9,269	9,722	10,157	10,574	10,975	11,360	11,729	12,084

Figure 38. Aggregate supply (current scenario of attrition and assuming maximum production from training), 2022–2032

5.2. PROJECTED NEED FOR HEALTH WORKERS BASED ON THE POPULATION'S NEED FOR HEALTH SERVICES

As indicated in the methods chapter, a needs-based framework that considers (a) disease burden, (b) population size, growth, and demographics, (c) model of essential service provision, and (d) health worker productivity (standard workload) – Figure 39 – was applied whilst projecting the health workforce needs for Uganda.
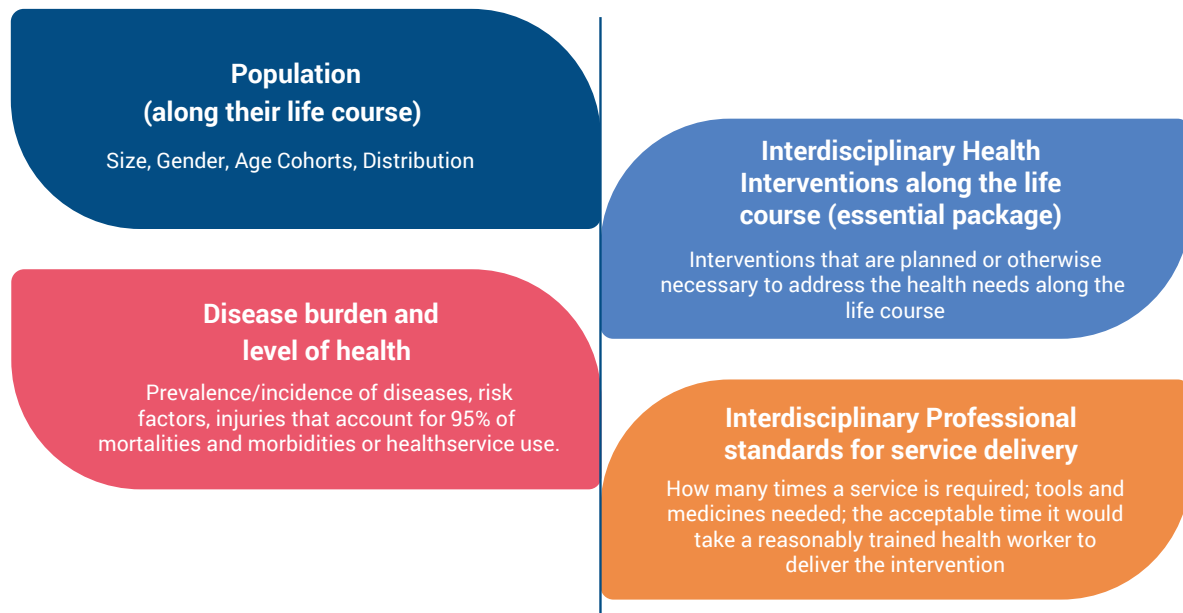
Figure 39. Factors used for Analyzing the Need for Health Workers in Uganda[27]

Table 12 presents the projected needs for health workers in Uganda based on its disease burden, risk factors and targeted interventions. Cumulatively, the projected need stands at 194,271 health workers in 2022 and will rise by 16% to 224,669 in 2027 and by 54% to 299, 692 in 2032. This need expands at an average rate of 4.5% per annum, fluctuating based on the anticipated dynamics in disease burden and the resultant population's need for health services.

The need for general practitioners based on the Ugandan population health needs, is estimated at 12,898 at a minimum in 2022 and this is anticipated to increase by 54% to 19,897 by 2032. This translates into a minimum need of 14.47 generalist doctors (medical officers) per 10 000 population or approximately one doctor for every 691 population if universal coverage of health services is to be achieved in Uganda.

For the medical specialists - physicians/ internal medicine, obstetricians and gynecologists, general surgeons, pediatricians, emergency medicine practitioners, ear nose and throat surgeons, orthopedic surgeons, ophthalmologists, pathologists, radiologists, microbiologists , psychiatrists and anesthesiologist - Uganda's disease burden and population demographics needed at least 5171 specialist doctors in 2022, which is anticipated to increase to about 7976, representing a 54% increase by 2032.

In addition, 88,586 nurses (enrolled and registered nurses) were needed in Uganda in 2022 and this will rise to 136,657 by 2032. For midwives (enrolled and registered), 63,143 are needed in 2023 with this number to rise to 97,407 by 2030.

Table 12. Projected needs-based requirements for health workers in Uganda, 2022 - 2032

Health Professionals	Projected Need for Health Workers based Population Health Needs (Displayed in Headcounts)										
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
General practitioners	12,898	13,291	13,691	14,095	14,504	14,916	15,331	15,747	16,164	16,699	19,897
Physicians/ Internal medicine	1,224	1,261	1,299	1,338	1,376	1,415	1,455	1,494	1,534	1,585	1,888
Obsterics and Gynecology	681	702	723	745	766	788	810	832	854	882	1,051
General Surgery	403	416	428	441	454	467	479	493	506	522	622
Pediatricians	125	129	133	137	141	145	149	153	157	162	193
Emergency medicine	825	850	876	902	928	954	981	1,007	1,034	1,068	1,273
Ear Nose And Throat Surgeons	267	275	284	292	301	309	318	326	335	346	412
Orthopedic surgeons	892	919	946	974	1,003	1,031	1,060	1,089	1,117	1,154	1,376
Ophthalmologists	153	158	162	167	172	177	182	187	192	198	236
Pathologists	90	93	95	98	101	104	107	110	113	116	139
Radiologists	120	123	127	131	135	138	142	146	150	155	185
Micobiologists	27	28	29	30	30	31	32	33	34	35	42
Psychiatriists	192	198	204	210	216	222	228	234	241	249	296
Anaesthethiologists	171	176	182	187	192	198	203	209	215	222	264
Dental Surgeons	1,560	1,608	1,656	1,705	1,754	1,804	1,854	1,905	1,955	2,020	2,407
Pharmacists	897	924	952	980	1,009	1,037	1,066	1,095	1,124	1,161	1,384
Enrolled nurse	28,319	29,183	30,060	30,948	31,846	32,750	33,661	34,575	35,491	36,665	43,687
Enrolled midwife	32,157	33,138	34,134	35,142	36,161	37,188	38,222	39,261	40,301	41,633	49,607
Registered Nurse	47,899	49,361	50,844	52,346	53,864	55,394	56,934	58,481	60,031	62,015	73,892
Registered Paediatric Nurse	840	866	892	918	945	972	999	1,026	1,053	1,088	1,296
Registered Palliative Care Nurse	32	33	34	35	36	38	39	40	41	42	50
Registered Public Health Nurse	7,831	8,070	8,313	8,558	8,806	9,057	9,308	9,561	9,815	10,139	12,081
Registered Mental Health Nurse	3,663	3,775	3,888	4,003	4,119	4,236	4,354	4,473	4,591	4,743	5,651
Registered midwife	30,986	31,932	32,891	33,863	34,844	35,834	36,831	37,831	38,834	40,117	47,800
Anaesthetic Officer	501	517	532	548	564	580	596	612	628	649	773

Health Professionals	Projected Need for Health Workers based Population Health Needs (Displayed in Headcounts)										
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Assistant Nutritionist	615	634	653	672	692	711	731	751	771	796	949
Medical Clinical Officer	9,171	9,451	9,735	10,023	10,313	10,606	10,901	11,197	11,494	11,874	14,148
Ophthalmic Clinical Officer	84	87	89	92	94	97	100	103	105	109	130
Ear Nose And Throat Clinical Officer	413	425	438	451	464	477	490	504	517	534	636
Psychiatric Clinical Officer	456	470	484	499	513	528	542	557	572	591	704
Anaesthetic Clinical Officer	537	554	570	587	604	621	639	656	673	696	829
Dispenser	711	732	754	777	799	822	845	868	891	920	1,096
Medical Imaging Technologist	250	258	265	273	281	289	297	305	313	324	386
Medical Laboratory Assistant	458	472	486	501	515	530	544	559	574	593	707
Medical Laboratory Scientific Officer	64	66	68	70	72	74	76	78	80	82	98
Medical Laboratory Technician	1,144	1,179	1,214	1,250	1,286	1,323	1,360	1,397	1,434	1,481	1,765
Medical Laboratory Technologist	1,808	1,864	1,920	1,976	2,034	2,091	2,150	2,208	2,266	2,341	2,790
Medical Radiographer	1,372	1,414	1,457	1,500	1,543	1,587	1,631	1,676	1,720	1,777	2,117
Nutritionist	2,197	2,264	2,332	2,401	2,471	2,541	2,612	2,683	2,754	2,845	3,389
Occupational Therapist	939	967	997	1,026	1,056	1,086	1,116	1,146	1,177	1,215	1,448
Orthopedic Officer	7	8	8	8	8	9	9	9	9	10	11
Physiotherapist	200	206	212	218	224	231	237	244	250	258	308
Public Health Dental Officer	977	1,007	1,038	1,068	1,099	1,130	1,162	1,193	1,225	1,266	1,508
Theatre Assistant	111	115	118	122	125	129	132	136	140	144	172
Uganda	194,271	200,199	206,214	212,306	218,462	224,669	230,915	237,188	243,473	251,523	299,692

5.3 ANALYSIS OF NEED AND SUPPLY GAPS AND MISMATCHES

Table 13 presents the need, supply, and staff availability ratio[28] (SAR) in percentages for various cadres in Uganda. The estimated need for health workers in Uganda in 2022 was 194,271 compared to an overall supply of 154,016 and this translates to the 79.3% of the need for health workers being available. Based on the current trend, by 2027, the need will be 224,669 health workers with the supply being 226,312 with 100.7% of needed health workers being locally available. By 2023, 95% of the health workers will be available to adequately meet the health needs of the population.

Table 13. Gap analysis of Aggregate need versus supply of health workers in Uganda

Health professionals	2022				2027				2032			
	Need (a)	Supply (b)	Gap (b-a)	SAR (b/a)	Need (a)	Supply (b)	Gap (b-a)	SAR (b/a)	Need (a)	Supply (b)	Gap (b-a)	SAR (b/a)
General practitioners	12,898	5,864	-7,034	45.50%	14,916	6,868	-8,048	46.00%	19,897	7,686	-12,211	38.60%
Physicians/ Internal medicine	1,224	272	-952	22.20%	1,415	286	-1,129	20.20%	1,888	298	-1,590	15.80%
Obsterics and Gynecology	681	315	-366	46.20%	788	363	-425	46.10%	1,051	402	-649	38.30%
General Surgery	403	216	-187	53.50%	467	245	-221	52.60%	622	269	-353	43.30%
Pediatricians	125	273	148	218.40%	145	315	170	217.80%	193	349	156	181.00%
Emergency medicine	825	10	-815	1.20%	954	8	-946	0.90%	1,273	7	-1,266	0.50%
Ear Nose And Throat Surgeons	267	56	-211	20.90%	309	60	-250	19.20%	412	62	-350	15.10%
Orthopedic surgeons	892	76	-816	8.50%	1,031	476	-556	46.10%	1,376	801	-574	58.30%
Ophthalmologists	153	66	-87	43.10%	177	220	43	124.40%	236	346	110	146.40%
Pathologists	90	58	-32	64.50%	104	195	91	187.40%	139	307	168	221.00%
Radiologists	120	74	-46	61.90%	138	256	118	185.10%	185	404	220	219.20%
Micobiologists	27	336	309	1244.00%	31	274	243	877.10%	42	223	182	536.10%
Psychiatriists	192	59	-133	30.70%	222	229	7	103.10%	296	368	71	124.10%
Anaesthethiologists	171	85	-86	49.70%	198	335	137	169.30%	264	539	275	204.20%
Dental Surgeons	1,560	504	-1,056	32.30%	1,804	554	-1,250	30.70%	2,407	595	-1,812	24.70%
Pharmacists	897	1,712	815	190.90%	1,037	1,396	359	134.60%	1,384	1,138	-246	82.30%
Enrolled nurse	28,319	52,049	23,730	183.80%	32,750	79,776	47,025	243.60%	43,687	102,383	58,697	234.40%
Enrolled midwife	32,157	24,259	-7,898	75.40%	37,188	36,650	-538	98.60%	49,607	46,754	-2,853	94.20%
Registered Nurse	47,899	20,429	-27,470	42.60%	55,394	23,895	-31,500	43.10%	73,892	26,720	-47,171	36.20%
Registered Paediatric Nurse	840	182	-658	21.70%	972	195	-777	20.00%	1,296	205	-1,091	15.80%

28 SAR = Staff Availability Ratio – a ratio of supply to need which measures the degree to which supply of HWF covers the need.

Health professionals	2022				2027				2032			
	Need (a)	Supply (b)	Gap (b-a)	SAR (b/a)	Need (a)	Supply (b)	Gap (b-a)	SAR (b/a)	Need (a)	Supply (b)	Gap (b-a)	SAR (b/a)
Registered Palliative Care Nurse	32	9	-23	27.70%	38	72	34	191.80%	50	123	73	246.40%
Registered Public Health Nurse	7,831	186	-7,645	2.40%	9,057	249	-8,808	2.70%	12,081	300	-11,781	2.50%
Registered Mental Health Nurse	3,663	1,101	-2,562	30.10%	4,236	1,225	-3,011	28.90%	5,651	1,327	-4,324	23.50%
Registered midwife	30,986	8,700	-22,286	28.10%	35,834	11,645	-24,190	32.50%	47,800	14,046	-33,754	29.40%
Anaesthetic Officer	501	353	-148	70.40%	580	708	128	122.10%	773	997	224	128.90%
Assistant Nutritionist	615	17	-598	2.80%	711	14	-698	1.90%	949	11	-938	1.20%
Medical Clinical Officer	9,171	12,937	3,766	141.10%	10,606	17,624	7,018	166.20%	14,148	21,446	7,298	151.60%
Ophthalmic Clinical Officer	84	264	180	314.40%	97	515	418	530.60%	130	720	591	555.90%
Ear Nose And Throat Clinical Officer	413	426	13	103.30%	477	370	-107	77.60%	636	325	-311	51.10%
Psychiatric Clinical Officer	456	345	-111	75.60%	528	535	8	101.40%	704	690	-14	98.10%
Anaesthetic Clinical Officer	537	250	-287	46.50%	621	204	-418	32.80%	829	166	-663	20.10%
Dispenser	711	1,548	837	217.80%	822	1,262	440	153.60%	1,096	1,029	-67	93.90%
Medical Imaging Technologist	250	218	-32	87.20%	289	390	101	134.90%	386	530	145	137.50%
Medical Laboratory Assistant	458	10,238	9,780	2235.10%	530	18,636	18,106	3518.00%	707	25,484	24,777	3606.40%
Medical Laboratory Scientific Officer	64	658	594	1034.60%	74	1,266	1,192	1720.90%	98	1,761	1,663	1795.20%
Medical Laboratory Technician	1,144	3,142	1,998	274.70%	1,323	2,562	1,239	193.70%	1,765	2,089	324	118.40%
Medical Laboratory Technologist	1,808	2,060	252	113.90%	2,091	4,352	2,261	208.10%	2,790	6,221	3,431	223.00%
Medical Radiographer	1,372	553	-819	40.30%	1,587	552	-1,035	34.80%	2,117	552	-1,565	26.10%
Medical Sonographer	-	29	29		-	24	24		-	19	19	
Nutritionist	2,197	76	-2,121	3.50%	2,541	256	-2,285	10.10%	3,389	402	-2,987	11.90%
Occupational Therapist	939	229	-710	24.40%	1,086	297	-788	27.40%	1,448	353	-1,095	24.40%
Orthopedic Officer	7	890	883	11988.60%	9	1,261	1,253	14689.10%	11	1,564	1,552	13654.10%
Orthopedic Technologist	-	392	392		-	472	472		-	537	537	
Pharmacy Assistant	-	199	199		-	5,369	5,369		-	9,584	9,584	
Physiotherapist	200	417	217	209.00%	231	502	271	217.40%	308	571	263	185.40%
Public Health Dental Officer	977	1,084	107	110.90%	1,130	1,539	409	136.20%	1,508	1,911	403	126.70%
Theatre Assistant	111	800	689	718.40%	129	1,815	1,687	1409.60%	172	2,643	2,472	1538.70%
Uganda	**194,271**	**154,016**	**-40,255**	**79.30%**	**224,669**	**226,312**	**1,643**	**100.70%**	**299,692**	**285,261**	**-14,431**	**95.20%**

ANALYSIS OF THE HEALTH LABOUR MARKET OF UGANDA

Worthy of mention is that for some categories of health workers, the need appears non-existent or underestimated. This should be interpreted with caution as this does not depict that they are not needed. Rather, it highlights that their area of practice is somewhat specific, and their interventions are often specialized with their services required in the later stages of the continuum of care (with most conditions often addressed before the sequalae ensues). In addition, the need analysis was restricted to conditions that had prevalence, incidence and coverage data which is needed for the estimations. A better approach for estimating their need will be based on workloads and service utilization trends in health facilities.

5.4 PROJECTION OF AGGREGATE ECONOMIC DEMAND FOR HEALTH WORKERS

The demand modeling indicated that Uganda had the capacity to hire 63,253 health professionals in 2020 based on the current economic parameters and health expenditure patterns. If these parameters and spending patterns do not diminish, the capacity is expected to expand by 49% to 94,158 by 2032.
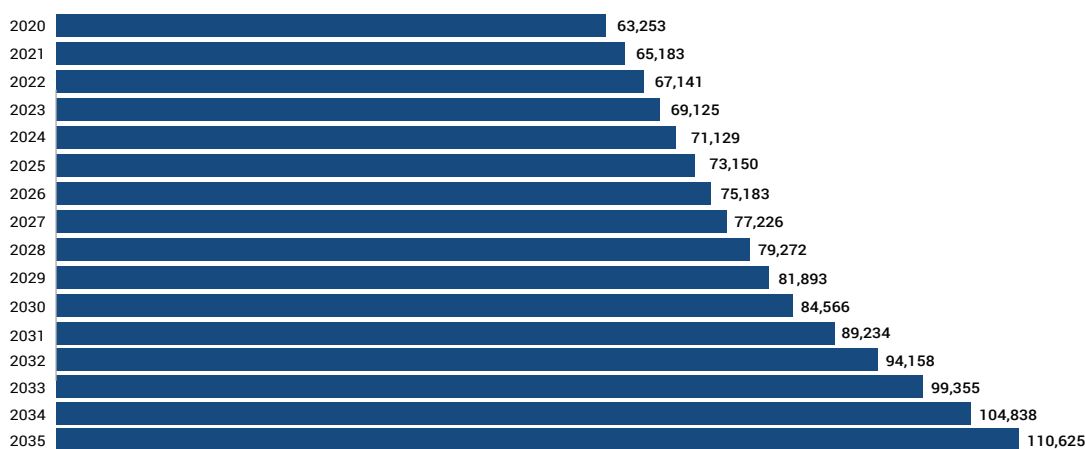

Year	Value
2020	63,253
2021	65,183
2022	67,141
2023	69,125
2024	71,129
2025	73,150
2026	75,183
2027	77,226
2028	79,272
2029	81,893
2030	84,566
2031	89,234
2032	94,158
2033	99,355
2034	104,838
2035	110,625

Figure 40. Estimated aggregate demand for health workers in Uganda, 2023- 2035

By health worker category, it was predicted that the demand for medical doctors (generalists and specialists) would rise from 4005 in 2023 to 5456 by 2032, whilst the need for nurses and midwives is expected to rise from 30,177 to 41,106 (refer to Figure 41).
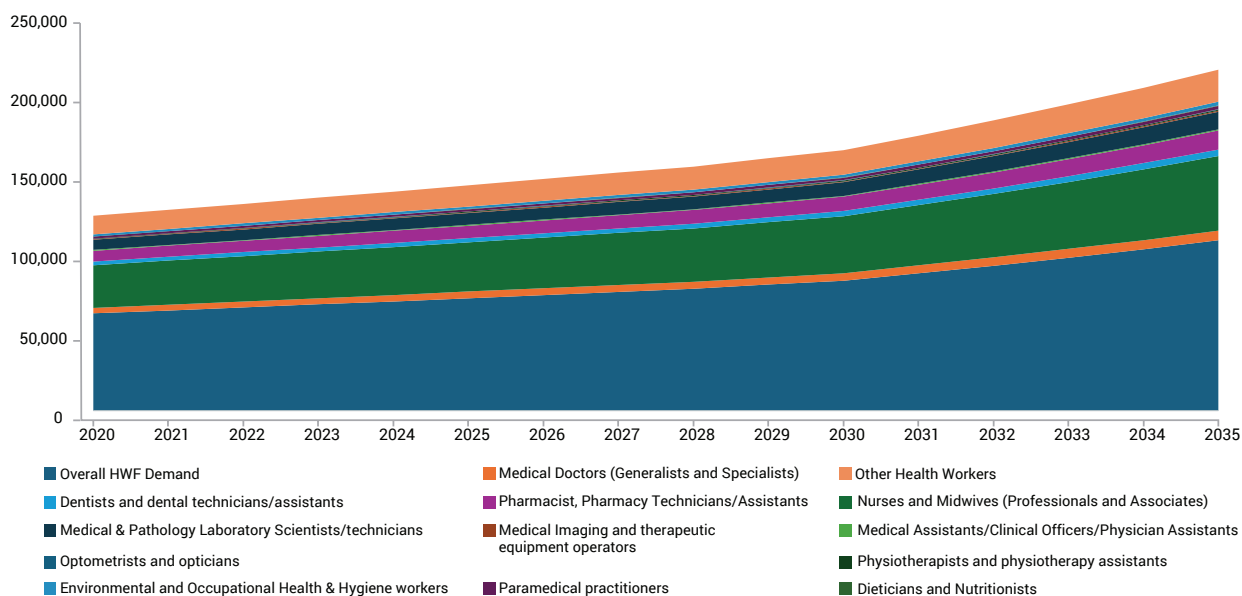

Figure 41. Predicted aggregate demand for health worker groups in Uganda, 2023- 2035

5.5 PROJECTED DEMAND VERSUS NEED AND SUPPLY

Figure 42shows that by 2030, there would be 79,272 health workers in total demand compared to 263,155 in total supply - thus, about 30% can be absorbed based on the HRH financial space. According to projections, there will be a greater overall need for 243, 473 health workers in 2030 with 263, 155 which will be available and 79, 272 in demand.
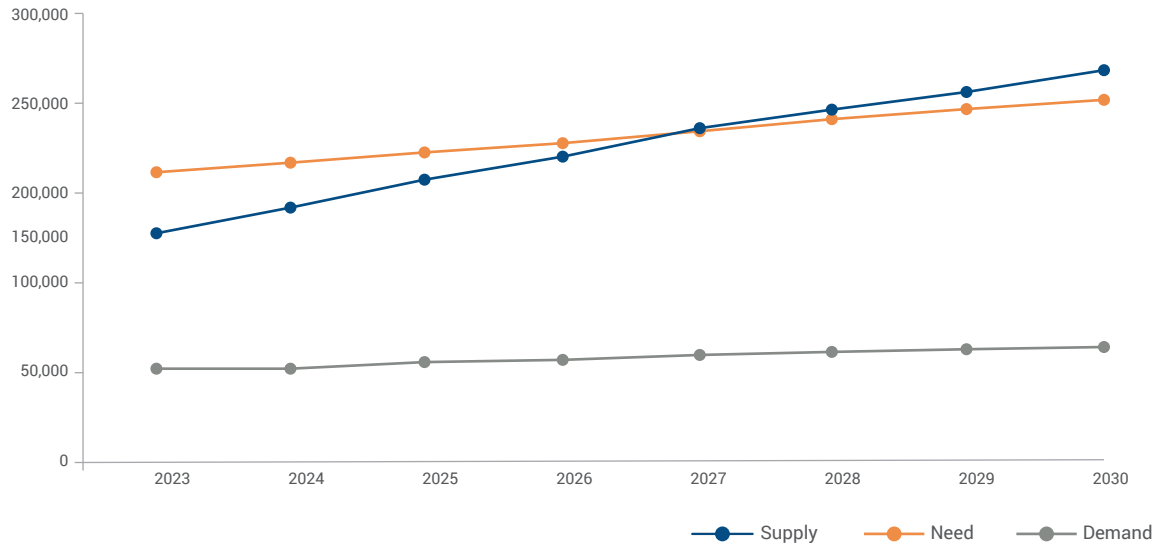

Figure 42. Projections of Demand, Need and Supply for all categories of health workers.

The projected supply for the medical doctors remains lower than the need-based requirement to meet the UHC targets. It was anticipated that the need for medical doctors would rise to 15,510 in 2030 against projected supply of 8824 in which translates to a 76% gap. (Figure 43).

For nurses and midwives, the gap between anticipated supply of and need for health workers to achieve Uganda's UHC objectives averages 7% (Figure 43).
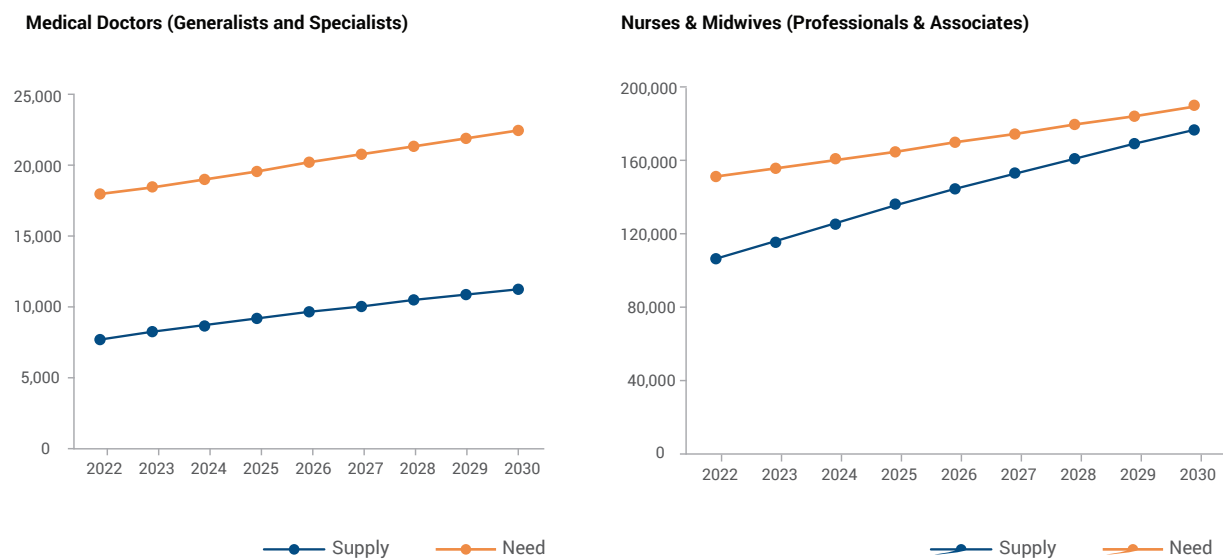
Medical Doctors (Generalists and Specialists)

Nurses & Midwives (Professionals & Associates)

Figure 43. . Projections of demand, need and supply for medical doctors, nurses, and midwives.

5.6 HEALTH WORKFORCE FINANCING AND ECONOMIC FEASIBILITY ANALYSIS OF THE LABOUR MARKET

This section presents the potential financial space needed or available to meet the present and future need-based health workforce requirements in the event that all other factors stay the same. Additionally, an estimate of the need-based budgetary space needed to meet the future burden of disease is provided. The lack of data on the education pipeline — that is, insufficient information on yearly admissions especially for degree programmes by private health training institutions, as well as the dropout rates, pass rates, and inflows from foreign training—made it impossible to calculate the cost of training to close the needs-based gap in population health. As a result, the analysis ignored the cost of training until the minimum information needed to estimate the cost of using projected supply and the percentage of supply-side wage bill that could be covered by the estimated financial space is obtained.

The fiscal space (government money) allotted to health workforce financing was USD 471.83 million in 2022 and USD 493.42 million in 2023; by 2032, this is expected to rise to USD 748.63 million. By 2032, it was expected that the private sector's financing of the health workforce would have increased to USD 295.71 million from USD 186.37 million. Thus, the cumulative wages and salaries in 2023 was estimated to be USD 688.33 million; by 2030, it was expected to rise to USD 1,044.34 million.

In 2022 and 2023, the bare minimum of funds needed to hire a staff based on the populations' health was USD 1.66 billion and USD 1.71 billion respectively; by 2032, that amount would increase to USD 2.56 billion. Table 14 also presents the estimated cost of employing the projected supply. these dynamics are presented graphically in Figure 44 .
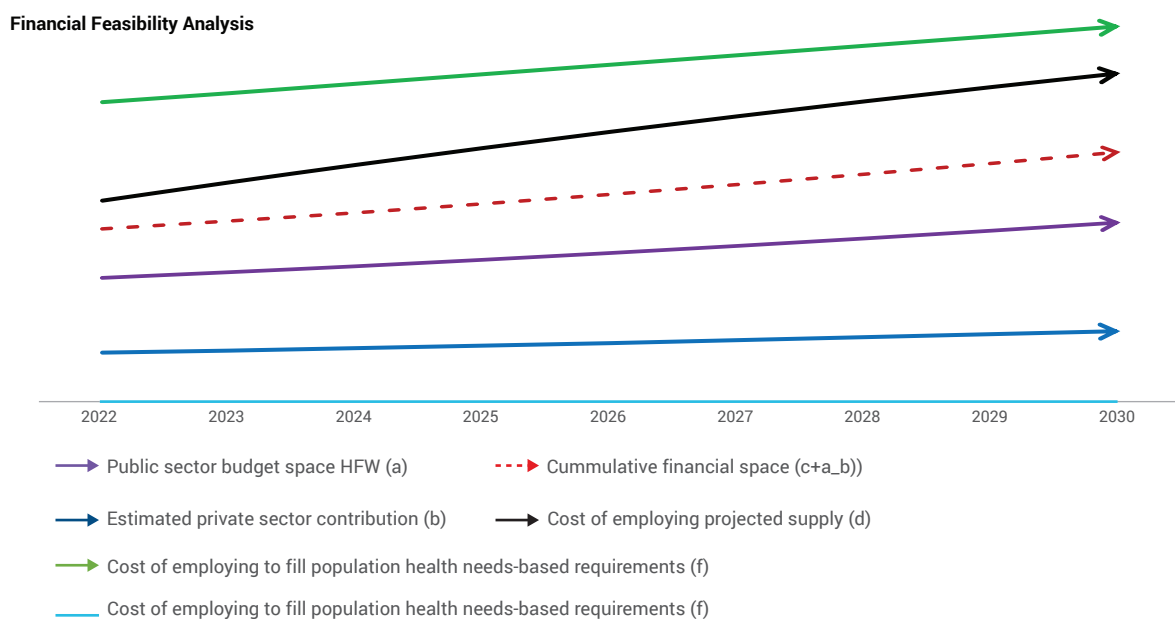

Financial Feasibility Analysis

| 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |

→ Public sector budget space HFW (a)
---▶ Cummulative financial space (c+a_b))
→ Estimated private sector contribution (b)
→ Cost of employing projected supply (d)
→ Cost of employing to fill population health needs-based requirements (f)
— Cost of employing to fill population health needs-based requirements (f)

Figure 44. Economic feasibility analysis under different projection scenarios in Uganda

Table 14: Estimates of economics feasibility of supply and needs compared with potential financial space (in Million USD)

Cost implications and financial sustainability estimates	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Average	Minimum	Maximum
Public Sector Budget Space for HWF (a)	471.83	493.42	516.01	540.58	566.31	593.28	621.53	651.12	682.12	714.60	748.63	471.83	493.42	516.01
Estimated Private Sector Contribution (b)	186.37	194.90	203.82	213.53	223.69	234.35	245.50	257.19	269.44	282.27	295.71	186.37	194.90	203.82
Cumulative Financial Space (c = a + b)	658.21	688.33	719.83	754.10	790.01	827.62	867.03	908.31	951.56	996.87	1,044.34	658.21	688.33	719.83
Cost of employing projected supply (d)	765.48	835.19	902.10	966.34	1,028.01	1,087.21	1,144.05	1,198.61	1,250.99	1,301.27	1,349.55	765.48	835.19	902.10
Cost of employing to fill population health needs-based requirements (f)	1,140.79	1,175.60	1,210.92	1,246.70	1,282.84	1,319.29	1,355.97	1,392.80	1,429.71	1,476.98	1,759.84	1,523.81	1,140.79	2,181.71

SECTION 06
Policy and Practice Recommendations

1. **Strengthen multi-sectoral health workforce governance, stewardship, and financing** to ensure planning for health workforce is informed by the populations health needs, resources are channeled to training priority cadres for Uganda's health system and health workers are absorbed into the labour market to ensure quality service delivery.

i) Conduct a high-level multisectoral national health workforce policy and investment dialogue to agree on modalities for the relevant ministries and entities to engage and discuss health workforce issues, and for evidence-based policy and strategic decisions to improve the access and availability of qualified, skilled, and motivated health workers within Uganda's health system.

ii) Engage the executive and parliament to obtain sustained commitment to incrementally improve investment in the health sector to improve the HRH financial space, and in health workforce development at national and district levels.

iii) Revise the national HRH strategic plan and develop a national health workforce investment plan to address contemporary issues in the HLM - in relation to education, supply, demand and need - with a robust M&E mechanism instituted to track performance.

iv) Scope the health workforce education policies across various sectors and conduct revisions needed to ensure that planning and management guidelines supports the achievement of UHC in Uganda.

v) Develop guidelines for improved partnership and oversight of the private sector to improve mutual accountability and guarantee access to quality health care to Ugandans.

2. **Ensure the availability of health workforce data, and functionality and interoperability of HRH information systems** at various ministries, institutions, and agencies, including the health professional councils.

i) Conduct a holistic review of HRH information systems and ensure that they track the agreed minimum data set for the health workforce based on the national needs.

ii) Progressively track inflows and outflow/attrition through retirements, emigration, deaths, resignations, and dismissals of the health workforce at regulatory bodies and by employers.

iii) Engage and leverage on existing and periodic Labor Force, Manpower and Household surveys conducted by the National Planning Authority and UBOS to obtain disaggregated information on the macroeconomic and demand contexts of the health workforce.

iv) Institute mechanisms to track the distribution of health workers across the private service delivery systems for evidence-based HRH planning.

v) Track and report the HLM dynamics through the annual National Health Workforce Accounts.

3. Enhance the professional regulatory bodies to regulate health workers across public and private sectors, and private service delivery sector.

i) Develop and implement interventions aimed at ensuring that all trained health workers are registered and tracked irrespective of sector of employment and employment status.

ii) Establish mechanisms to track emigration of health workers and routinely report this to relevant ministries and entities to guide planning for the training and recruitment of health workers.

iii) Enforce renewal of practicing licenses for health workers providing health services to the population in public and private settings

iv) Monitor and ensure quality in the establishment and operations of the public and private health training institutions.

v) Partner with the MoE and MoH in the development and/or review of preservice training standards and curricula to ensure it aligns with the disease burden and clinical service delivery modalities.

4. Sign and implement health worker mobility bilateral agreements with countries benefiting from the migration of Uganda's health workforce with the aim of strengthening Uganda's health system to achieve its SDG targets. This is pertinent considering the high migration rates of trained health workers, Uganda's investment in training health workers which eventually emigrate, and the current trend of the HRH financial space which indicates that the public and private sector cannot absorb the health workers being produced.

i) Based on the findings of this HLMA and other health systems assessments, MOH should engage other ministries to articulate interventions for addressing the gaps and challenges.

ii) MOH and other relevant ministries and entities should engage a broad range of stakeholders to be impacted by the bilateral agreement to gain perspectives and manage concerns.

iii) Designated ministry/ MOH should conduct negotiations with relevant benefactors to develop a mutually beneficial agreement with clear terms, execution and management plan, and monitoring mechanisms.

iv) MOH should develop an investment plan aimed at ensuring that benefits of the agreement directly contribute to Uganda achieving its health sector goals.

THE REPUBLIC OF UGANDA

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Findings from a descriptive and predictive analysis 2023

DEVELOPED WITH ASSISTANCE FROM

World Health Organization

Uganda