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Health Labour Market Analysis for Kenya

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ABBREVIATIONS AND ACRONYMS

CHAK	Christian Health Association of Kenya
DPs	Development Partners
GDP	Gross Domestic Product
GEI	Geographical Equity Index
GoK	Government of Kenya
GSHRH	Global Strategy on Human Resources for Health
HIMS	Health Information Management System
HRIS	Human Resource Information System
HIV	Human Immune Virus
HRH	Human Resources for Health
HRM	Human Resources Management
KHSSP	Kenya Health Sector Strategic Plan
HWF	Health Workforce
KES	Kenyan Shillings
KNBS	Kenya National Bureau of Statistics
KHRAC	Kenya Human Resource Advisory Council
TNT	The National Treasury
MoH	Ministry of Health
NHWA	National Health Workforce Account
PSC	Public Services Commission
SRC	Salaries and Remuneration Commission
TB	Tuberculosis
WHO	World Health Organization
WHO/AFRO	World Health Organization, Regional Office for Africa
ONA	Organization Network Analysis
CSV	Comma Separated Values
URL	Uniform resource Locator

GLOSSARY

Accreditation (in professional education): The process of evaluation of education institutions against predefined standards required for the delivery of education. The outcome of the process is the certification of the suitability of education programmes and of the competence of education institutions in the delivery of education.

Capacity-building, capacity development: It is the process of developing and strengthening the skills, instincts, abilities, processes and resources that organizations and communities need to survive, adapt and thrive in a fast-changing world.

Decent work: Decent work involves opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men.

Demand (for health services): The health care expectations expressed by individuals or communities; or, the willingness and ability to seek, use, and, in some settings, pay for services. It may be subdivided into expressed demand (equated with use) and potential demand. It may also be subdivided into rational demand (demand that corresponds to need) and irrational demand (demand that does not correspond to need).

Demand (for health workers): The demand for health workers corresponds to the number of health workers that a health system can support in terms of positions or economic demand for services. In other words, it reflects the capacity and willingness to pay of the purchasers of health care (for example, government, private sector firms), which in turn drives the demand for employing health workers in public or private hospitals, public health centers, and other parts of the health system, including self-employed health workers. The demand for health workers is therefore a derived demand for health services.

Dual practice: There are several forms of dual practice. Health professionals can work in a public service provision role and another role: (a) outside: in a completely separate private environment; (b) beside: in a private ward or clinic physically associated with a public facility but run as a separate business; (c) within: where private services are offered inside a public facility but outside public service operating hours or space; or (d) integrated: where additional fees are charged for services offered alongside standard public ones, often informally, on the understanding of a faster – or higher-quality – service. Academics and policymakers typically restrict the term dual practice to category (a), but it is clear that categories (b), (c) and (d) present alternative scenarios for health professionals to combine public and private practice, and supplement public sector salaries;

policy-making in this domain should navigate the trade-offs between the objective of retaining personnel while ensuring their commitment to public sector objectives.

Education (of health workers): The process of developing knowledge, skills, attitudes and competencies related to the delivery of health services. Specialization is the process of developing advanced knowledge, skills, attitudes and competencies related to the delivery of specific health services.

Employment status: full-time, part-time, temporary, permanent: Full-time (whole-time) is employment for or working for the amount of time considered customary or standard. Part-time is employment for or working for less than the amount of time considered customary or standard. Permanent is employment contracted for an indeterminate period. Fixed term is employment contracted for a fixed period of time. Temporary refers to short-term contracts or "casual" work, either for a definite period or for a specific activity. Self-employment is when remuneration is directly dependent upon the profits derived from the goods and services produced by the individual.

Health labour market: The structure that allows services of health workers to be sought (demanded) and offered (supplied). The health labour market can be characterized according to geographical area (local, national or international); occupation (by occupation title or category, specialized or unspecialized); and sector (private or public, formal or informal). The dynamic between the number and the kind of jobs offered on the market and the number of health workers is central in determining the configuration of the health labour market.

Health workforce, human resources for health, health workers: All persons engaged in actions whose primary intent is to enhance health. Three categories of workers relevant for health workforce analysis can be distinguished: (a) those with health vocational education and training working in the health services industry; (b) those with training in a non-health field (or with no formal training) working in the health services industry; and (c) those with health training who are either working in a non-health-care-related industry or who are currently unemployed.

Health workforce planning: The process of estimating potential requirements for human resources for health and of designing ways of fulfilling those requirements, including strategies that address the adequacy of the supply and distribution of the health workforce according to policy objectives and the consequential demand for health labour.

International Standard Classification of Occupations (ISCO): An international classification for organizing jobs into a clearly defined set of groups according to the tasks and duties undertaken in the job. It is maintained by the International Labour Organization.

Mismatch: A discrepancy or a lack of correspondence between demand and supply that can result in (a) health worker shortage or surplus; (b) skills mismatch related to under education or over education; or (c) labour discrimination or bias exercised by the employer.

National Health Workforce Accounts (NHWA): A mechanism to collate and use a set of standardized indicators to generate reliable human resources for health information and evidence, with the objective of enabling planning, implementation and monitoring of workforce policies towards universal health coverage and improving comparability of health workforce data nationally and globally.

Occupation: A set of jobs whose main tasks and duties are characterized by a high degree of similarity.

Out of the labour force: Individuals who are neither employed nor unemployed and who are not looking for a job.

Productivity (technical efficiency): The outputs extracted from given inputs, such as patients seen per doctor or number of procedures per provider.

Stakeholder: An individual, group or organization that has an interest in the organization and delivery of health care.

Stock: The total number of health workers potentially available in a country, including those participating in the health labour market, plus those who are qualified to do so but do not participate for some reason, such as early retirement.

Supply (of health workers): The number of health workers active in the health labour market, either in employment or not employed but willing to work.

Surplus (of health workers): The situation in which more qualified health workers are willing to work than there are jobs readily available to employ them.

FOREWORD

It is with great pride that I introduce this comprehensive Health Labor Market Analysis (KHLMA) 2023 report. The report couldn't have come at a better time; we are rolling out the Bottom-up Economic Transformation Agenda (BETA), key amongst is the delivery of Universal Health Coverage (UHC) in a global context defined by unprecedented challenges and transformations in healthcare including post-pandemic recovery, unfavourable global economic outlook, and health workforce mobility issues. In this context, understanding the dynamics of the health labour market is cardinal to ensure attainment of UHC for the people of Kenya.

As the world grapples with the ever evolving healthcare needs, global workforce shortages, and shifting demographics, no country can afford to act in isolation, indeed a thorough and in-depth understanding of the domestic health workforce supply pipeline and value chains must be complemented by a rational and scenario based regional and global contexts analysis that ensures realistic inferences. The perspectives from this report provides invaluable insights that will inform policymakers, healthcare institutions, production and training pipelines and stakeholders alike to ensure a whole sector approach thereby eliminating inefficiencies and promoting evidence-based health workforce investments.

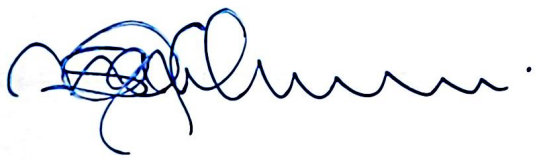
The descriptive and analytical part of the report not only provides the current state of the health labour market but also projects its trajectory, helping us anticipate future demands and trends. The qualitative aspect investigates the underlying reasons and explores the in-depth root causes to help explain the situational and behavioural subjective parameters like job satisfaction, intent to migrate, salary expectations thereby providing insights for critical decisions.

The report provides a synthesis of rigorous research, data analysis, and expert opinions. We have strived to create a holistic view of the health labour market, emphasising its interconnectedness with broader societal and economic factors. This holistic perspective is essential for crafting informed policies and strategies for Kenya.

I commend the dedication of our multi-agency research team and extend my gratitude to all the individuals and organizations, government and non-state actors, that contributed their expertise and data to this endeavour. My special gratitude goes to WHO that provided both technical and financial support to the process. The collaborative spirit behind this report reflects our shared commitment to ensuring a robust and resilient health workforce for the country, it is a testament to the dedication and collaborative efforts of our team to shed light on the intricate web of factors

influencing the health labour market. The ministry commits to bringing every stakeholder to act in the various facets of making a difference and to subsequent periodic HLMA studies to guide Kenya's health workforce policy.

In conclusion, this HLMA report is not just a document; it is a resource that empowers us to make informed health workforce decisions at all levels, all sectors, drive positive change, and ultimately enhance the quality of healthcare for all. I encourage you to engage with its findings, and join us in the journey to shape a healthier and more sustainable future.



Hon. Nakhumicha S. Wafula,
Cabinet Secretary,
Ministry of Health.

ACKNOWLEDGEMENTS

The Kenya Health Labour Market Analysis is an important undertaking in line with ensuring we address health workforce challenges on the path to universal health coverage through evidence-based health workforce strategies and policies.

This report is a product of multi-sectoral and multi-stakeholder collaboration led by the Ministry of Health. The key stakeholders were the Council of Governors (COG), Ministry of Education, State Department of Labour, Professional councils, National Council for Population and Development (NCPD), Kenya National Bureau of Statistics (KNBS), Kenya Health Professionals Advisory Council (KHPOA), Kenya Human Resources for Health Advisory Council (KHHRAC), Kenya Private Health Sector, Christian Health Associations and County governments, health facilities and staff.

The Multi-Agency team that led the development of the Kenya Health Labour Market Analysis was under the strategic oversight of the A.g Director General for Health Dr Patrick Amoth, and steering team comprised of Dr. Kigen Bartilol, Dr Zeinab Gura, and Dr Julius Ogato supported by Dr Hezron Omolo, Dr Joel Gondi and Dr Nakato Jjumba. These leads coordinated the technical working group which was composed of Dr David Soti, Dr Annah Wamae, Dr Stephen Muleshe, Dr Kiogora Gatimbu, Dr Mutile Wanyee, Dr Rabera Kenyanya, Dr Kioko Jackson, Dr Valeria Makory, Dr Amos Oyoko, Dr Nkatha Mutungi, Dr Angela Nyakundi, Mr Stephen Kaboro, Mr Stephen Khaemba, Mr Benard Otieno, Ms Mary Wanjiru Njogu, Ms Teresa Ogumbo, Ms Maureen Monyoncho, Ms Catherine Chege,Ms Meldah Angir, Mr Patrick Kyalo, Mukami Kibaara, Rachel Ndana, Njoroge Nyoike, Benson Karugu, John Yiampoi, Dr Robert Gesure, Bernard Kiprotich, Francis Kundu, Erastus Karani, Japheth Athanasio, Francis Motiri, Yusuf Suraw, Hanah Gitungo, Mary Magumbo, Dr Wesley Ogera Ooga, Prisciller B Emojong, Stephen Muthama, Douglas Kotut, Purity Kimathi, Mr Thomas Maera, Ms Jacinta K Waa, Ms Margaret K Oyugi and Ms Pricilla J Najoli. All the contributors are acknowledged for their expert technical inputs and review.

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Ms. Mary Muthoni Muriuki, HSC,
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EXECUTIVE SUMMARY

The Kenya Health Labour Market Analysis (KHLMA) was undertaken to create responsive workforce policies and decisions to optimize access to health services, and to unlock the health, economic, and social benefits of investing in health and care workers. The HLMA is essential to understand the dynamics and challenges that the health labour market faces through a comprehensive and integrated multisectoral policy analysis of the education supply pipeline, absorption, recruitment, distribution, retention, productivity, and financing of the health workforce (HWF), as well as the future outlook of these dynamics.

In order to address the root causes of key workforce challenges and attain UHC, effective policies will be developed to optimize the supply of health workers. This will be accomplished through comprehensive planning of the health workforce based on an in-depth analysis of the health labour market to understand and respond to the driving forces affecting workforce supply and demand, both within the Country and at the global level.

A multi-method approach was used to collect and analyse data on the health labour market dynamics in Kenya. These included desk review, stakeholders' discussions (inception meetings, key informant and focus group discussions), triangulation of secondary data from multiple sources, descriptive analysis of existing quantitative data and a group modelling exercise for the future outlook of need, demand and supply of the health workforce.

Key Findings

The health sector has been contributing to approximately 2.04% of the Country's GDP and notably, the small contribution to GDP is even on a downward trend, decreasing by 1.3% per year. The analysis revealed that the overall employment in the economy has generally been on a positive growth trajectory, increasing from 4.6% in 2010 to 5.5% in 2020. Furthermore, the private sector has been the driver of employment in the health labour market with an average growth rate of 7% per annum as compared to 4.1% annual rate of growth from the public sector. However, Kenya's current health workforce gap remains large.

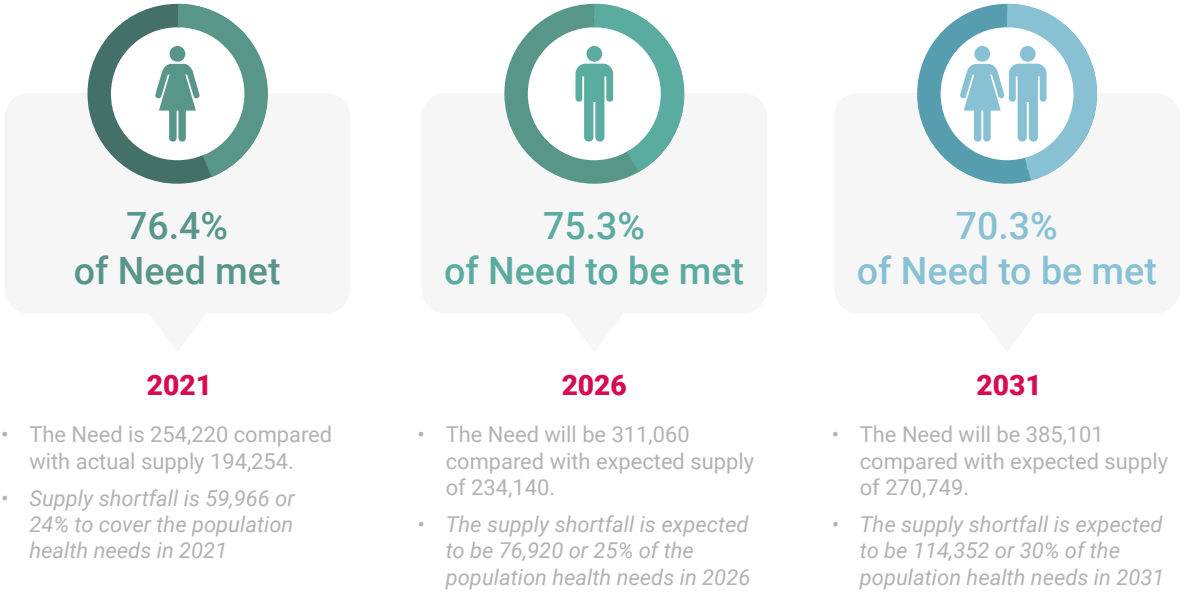
Generally, the health workforce is mainly composed of nurses, clinical officers and medical doctors accounting for 77.8%. The density of Doctors, Nurses, Midwives and Clinical Officers per 10,000 population increased by 106% from 2006 to 2020. However, in comparison with international HWF thresholds, Kenya has 68% of the SDG threshold indicator, falling short of the 2030 target by 32%. Thus, at the prevailing rate of increase, this target could be met earlier than 2030. Overall, the best staffed county is 7.31 times better off than the worst staffed county.

Data on employment in the public and private sector show that over the past years the rate of employment growth in the private sector has been more important than in the public sector, hence highlighting the role of the private sector in Kenya as a main driver of health employment.

The internal relativity of the income of health workers was explored and the results revealed a wide pay relativity gap between health workers, when measured against the General Practitioner (GP) as a proxy. On average, other health professionals earn about 60% of the level of income of the GP. Notably, the health workers in the public sector have a relatively higher remuneration than their counterparts in the private sector.

The overall stock of health workers has more than doubled over the past decade, increasing by approximately 11% per annum and is currently reported as 189,932 active health workers across 13 major health occupations. Out of the active stock 75.41% were in employment (either public or private sectors) and 14.34% were either unemployed or underemployed requiring further exploration owing to data limitation.

There could be 6% deterioration expected over 10 years: The projections show that the supply of 31 cadres is at almost 76% of the need in 2021; it may marginally reduce to 75% in 2026 and 70%o in 2030 because the need is growing faster than the supply and absorption.



The outlook of the health workforce supply and supply projections is estimated to record a net increase of 3.3% per annum translating into adding 8,123 health workers to the overall stock annually after offsetting for all forms of attrition.

Therefore, the cumulative requirement for the health workers based on the populations' need for health services would likely be 297,880 by 2025 and up to 473,724 by 2035. Consequently, the projections show that the supply of 32 cadres is at almost 77% of the need as of 2021 and may marginally reduce to 75% in 2026 and 70% in 2030 because the need is growing faster than the supply and absorption.

The Price Tag:
How Much Investment is needed in the HWF by 2030

COST OF TRAINING HEALTH WORKERS TO FILL NEED GAPS	ESTIMATED WAGE BILL WITH CURRENT STATUSQUO	NEED-BASED WAGE BILL COST
• There is a need to train 114,352 health professionals across 32 occupations by 2031.	• With current level of training, by 2031, the available health workforce across 30 occupational groups is projected to increase from 194,254 to 270,749	• If Kenya were to train and employ all the health workers needed based on disease burden, population and professional standards of service delivery, the health workforce required would be 385,101 across 32 occupations by 2031.
US$ 0.84 billion	**US$ 4.01 billion**	**US$ 6.62 billion**
Shared by Gov't and private individuals	From current US$2.85 billion in public + private	in public + private

RETURN ON THE INVESTMENT:

- Return on investment is enormously 1:9 (WHO, 2016) yielding 2-3 wider jobs per health professional employed (ILO, 2015).
- In Kenya, for every 5,400 HWF employed, their efforts are correlated with at least one year of added life expectancy ($R^2=0.8698$, $p<0.001$)
- Decreased risk of Kenyan women dying from pregnancy and childbirth ($R^2 = 0.9253$ $p<0.001$).

The following policy recommendations are presented from the analytics and findings of the Health Labour Market Analysis, for the Government of Kenya's consideration and action:

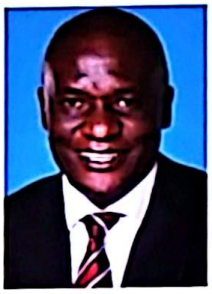
I. Prioritise multisectoral health workforce governance, planning and investment to address population health needs and increase health worker absorption and retention in the health labour market.

II. Optimise the quantity and quality of health workforce education and training (production) to address the evolving population health needs.

III. Improve the regulation and oversight of the health workforce to enhance the delivery of quality health services

IV. Strengthen health workforce data, evidence generation and use for enabling effective policy, decision making, and investments

In conclusion, the 2021 HLMA provides a robust evidence-base for developing effective HRH policy that can contribute to progress towards the attainment of UHC.



Dr. Patrick Amoth, EBS
Ag. Director General,
Ministry of Health.

Section 1

1. INTRODUCTION

1.1 Context / Background

1.1.1 Geographic and Socio-economic information

Kenya is located in the East African region and has a total surface area of 581,309 km2. It borders Tanzania to the south, Uganda to the west, South Sudan to the northwest, Ethiopia to the north, Somalia to the northeast and the Indian Ocean to the southeast. The country is mainly comprised of lowlands and highlands, with the Lake Victoria region and the coastal region making up most of the lowland. The highlands are mainly inland on both sides of the Rift Valley. Politically and administratively, the country is divided into 47 counties that are further divided into several sub-counties. Under a devolved system of decentralization, each county elects a governor, and the counties are semi-autonomous in managing service delivery and some development initiatives. However, the central government maintains control over overall policy direction, revenue raising and budget allocation to the counties.

Over the last decade, the economy had a steady growth averaging 5% annually. For instance, the growth rate of the Gross Domestic Product (GDP) declined marginally from 5% in 2015 to 4.2% in 2016, then to 3.8% in 2017 but recovered strongly to 5.6% in 2018 and 5.4% in 2019. The economy, however, contracted significantly with a -0.3% growth rate in 2020 due to the adverse economic impact of COVID-19 pandemic and its associated response measures. This notwithstanding, the GDP growth rate was projected at 5% in the year 2021. The GDP per capita at constant prices which was estimated to be KES 174,035.7 in 2017 increased to KES 179,021.6 in 2020 (KNBS, 2021).

Kenya has recorded modest success in reducing poverty that continues to be an important barrier to access to basic services, including health services. According to the Kenya Integrated Household Budget Survey (KIHBS) conducted in 2005/06, about 46% of Kenyans lived below the absolute poverty line, which markedly improved to 36.1% in 2015/16, but have worsened to 41.9% in 2020, possibly influenced partly by the adverse economic impact of the COVID-19 pandemic. The 2015/16 round of the KIHBS showed stack variation in the poverty levels between rural and urban areas, with 40.1% of the rural population compared with 27.5% in peri-urban areas and 29.4% in core urban areas (KIHBS 2015/16).

1.2 Demographics and health status

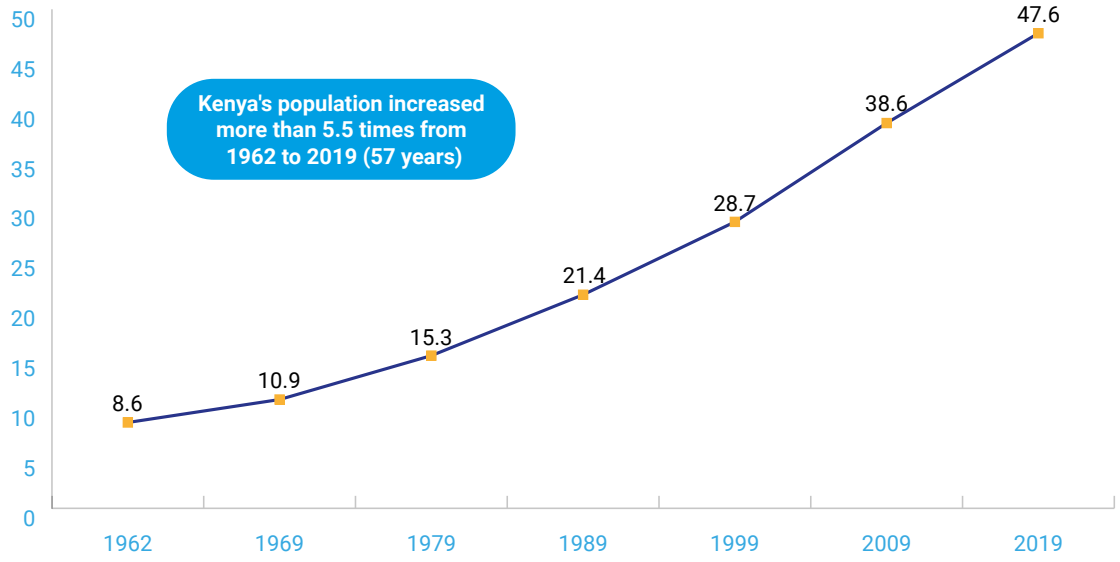
1.2.1 Population Size and Growth

Kenya's population in 1962 was about 8.6 million people, which increased to 15.3 million in 1979, 21.4 million in 1989 and 38.6 million in 2009 (See Figure 1). The 2019 Kenya Population and

Housing Census enumerated the country's population at 47.6 million with slightly more females (50.5%) than males (49.5%). Kenya's population has been growing rapidly over the years, though the growth rate since the last decade has slowed. For instance, the annual population growth rate slowed from 2.8% in 2009 to 2.3% in 2019, yielding a population increase from 39.1 million in 2009 to 47.6 million in 2019 (KNBS, 2019). Over two-thirds (69%) of Kenya's population resides in the rural areas. Nairobi County has the highest population at over 4 million followed by Kiambu and Nakuru counties with over 2 million each. Isiolo and Lamu counties are the least populated ones with less than 300,000 people each. Between 1963 and 1979, the country's population growth rate increased from 3% to a peak of 3.8% before declining to 2.9 and 2.2% in 2009 and 2019 respectively[1]. By 2030, Kenya's population is expected to reach about 60 million[2].

Kenya's population increase over the years has largely been driven by high fertility rates. For instance, in 1978, the country's fertility was estimated at 8 children per woman, the highest that the country has ever recorded. Improved access to family planning and education have influenced a reduction to an average of 4 children per woman in 2019. Despite this decrease, Kenya's population is expected to continue increasing until 2080[3]. Counties with the highest fertility levels are Wajir with an estimated 8 children per woman, West Pokot and Turkana (7 children per woman), and Samburu (6 children per woman) while those with the lowest fertility levels are Kirinyaga (2 children per woman), followed by Nyeri, Kiambu, and Nairobi (each with 3 children per woman)[4].

Figure 1: Trend of Kenya's Population Size, 1962–2019



Source: *Kenya National Bureau of Statistics*

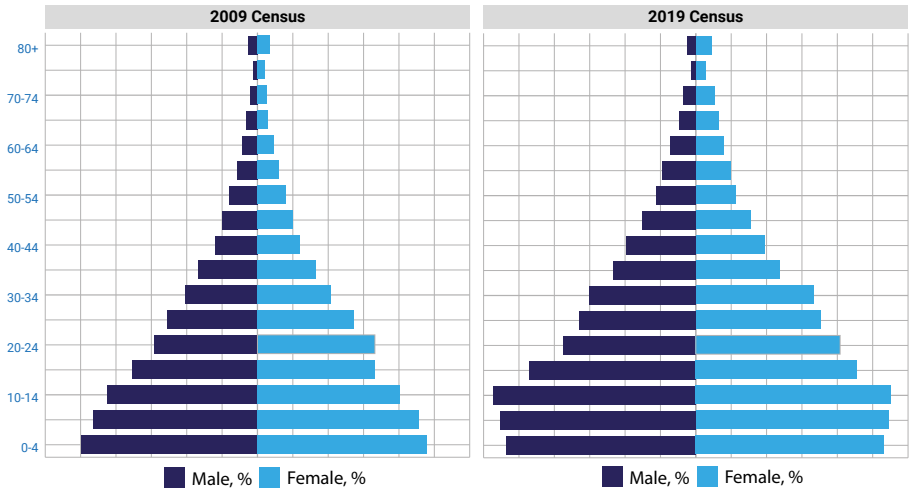
1 Kenya National Bureau of Statistics (2019). 2019 Kenya Population and Housing Census.
2 National Council for Population and Development (2021). Population Projections for Kenya 2020-2100.
3 National Council for Population and Development (2021). Population Projections for Kenya 2020-2100.
4 Kenya National Bureau of Statistics (2014). Kenya Demographic and Health Survey 2014.

Internal migration has shown to be an important factor in the changes in the population size of counties – where 14 counties are at the receiving end of migration from 33 counties. The 2019 Kenya Population and Housing Census particularly found that fourteen counties (Nairobi, Kiambu, Kajiado, Nakuru, Mombasa, Uasin Gishu, Narok, Laikipia, Kirinyaga, Lamu, Nyandarua, Trans-Nzoia, Isiolo and Embu) are net gainers of recent migrants. The remaining 33 counties (especially Kisii, Kakamega, Bungoma, Kitui, and Vihiga) are net losers of recent migrants[5].

1.2.2 Age Structure / Cohorts

The age structure of a population has direct implications on health service requirements, the distribution of economic resources, which in turn, is inextricably tied to the development progress. Kenya has a largely young population with at least 60% being less than 25 years. However, as shown in the population pyramid in Figure 2), Kenya's population evolving albeit gradual with the proportion of the population below age 15 declining from 43% in 2009 to 39% in 2019.

Figure 2: Trend of Kenya's Population Structure, 2009 vs 2019



As demonstrated in Table 1, between 2009 and 2019, younger population groups up to 12 years recorded declines in their proportional share of the Kenyan population, while significant increases were recorded within the older age groups. For example, the cohort of children below one year declined from 1.2 million in 2009 to 1.1 million in 2019, but those who were 60 years or more increased from 1.92 million in 2009 to 2.74 million in 2019. Also, the Women of Reproductive Age (WRA) – 15 – 49 years old increased from 48.3% of total female population in 2009 to 50.4% of total female population in 2019 (2% change within a decade).

The 2019 Kenya Population and Housing Census also enumerated vulnerable and key populations such as persons living with disabilities (916,635), orphans (209,396), inter-sex persons (1,524) and the homeless (20,101).

5 Kenya National Bureau of Statistics (2019). 2019 Kenya Population and Housing Census.

Table 1: Population of selected Age Cohorts and their share of total population

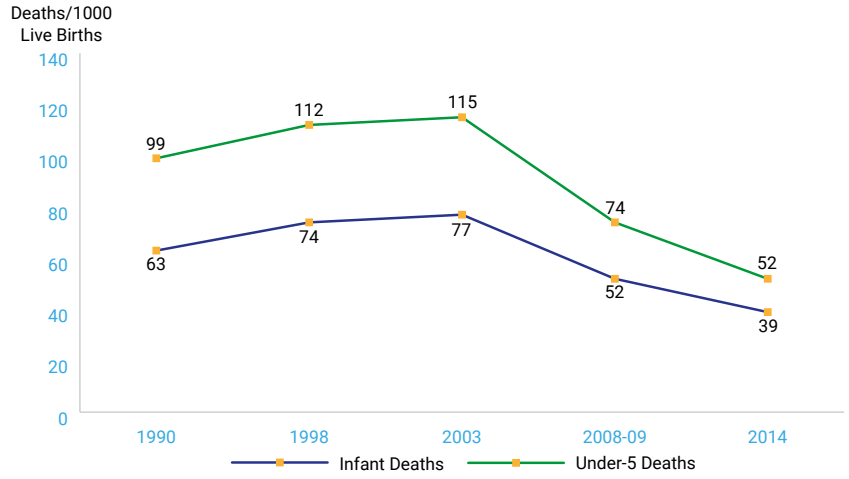
Cohort	Population (2009)	% of Total Population (2009)	Population (2019)	% of Total Population (2019)
Less than 1 Year	1,221,937	3.2%	1,105,074	2.3%
Less than 5 Years	5,939,306	15.4%	5,993,267	12.6%
5 - 12 Years	8,739,529	22.6%	10,082,582	21.2%
13 - 24 Years	9,837,688	25.5%	12,199,664	25.6%
25 - 59 Years	12,146,437	31.5%	16,547,581	34.8%
60+ Years	1,926,051	5.0%	2,740,515	5.8%
Women age 15-49	9.375,784	48.3% of total female population	12,094,679	50.4% of total female population

Source: *Kenya National Bureau of Statistics, 2019*

1.3 Health Status

Kenya faces a triple burden of disease where communicable diseases still dominate all causes of morbidity and mortality with infectious diseases and injuries contributing more than half of the deaths but an estimated 39% are due to non-communicable diseases[6]. It is projected that in the coming years the share of deaths from non-communicable diseases and injuries will continue to increase[7]. As a proxy for mortality patterns, the trend in Kenya's infant and under-5 deaths, as shown in Figure 3, demonstrates that between 1990 and 2003 the mortality levels were on the increase, but began to decline steadily from 2003, reaching 39 infant deaths and 52 under-5 deaths for every 1,000 live births by 2014. In 2019, the World Health Organization (WHO) estimated that Kenya's Infant and Under-5 deaths had declined further to 32 and 43 deaths per 1,000 live births respectively[8].

Figure 3: Trend in Infant and Under Five Mortality, 1990–2014



Source: *Kenya Demographic and Health Survey*

6 Ministry of Health (2021). National Strategic Plan for the Prevention and Control of Non-Communicable 2021-2025
7 Ministry of Health (2015). Kenya STEPwise Survey for Non-Communicable Diseases Risk Factors Report 2015
8 World Health Organisation (2019). Global Health Observatory 2019.

Although maternal mortality rates in Kenya have been on the decreasing trend, it has remained high for several decades despite concerted efforts to bring it down. The Millennium Development Goals (MDGs) target was to achieve a Maternal Mortality Ratio (MMR) of less than 70 deaths per 100,000 live births by 2015, but Kenya missed this target, as the MMR stood at about 362 deaths per 100,000 live births (Kenya Demographic and Health Survey; 2014). Nonetheless, between 2009 and 2019, Kenya recorded a remarkable increase in life expectancy at birth from 59 to 67 years respectively[9].

1.4 Overview of Kenya's health system

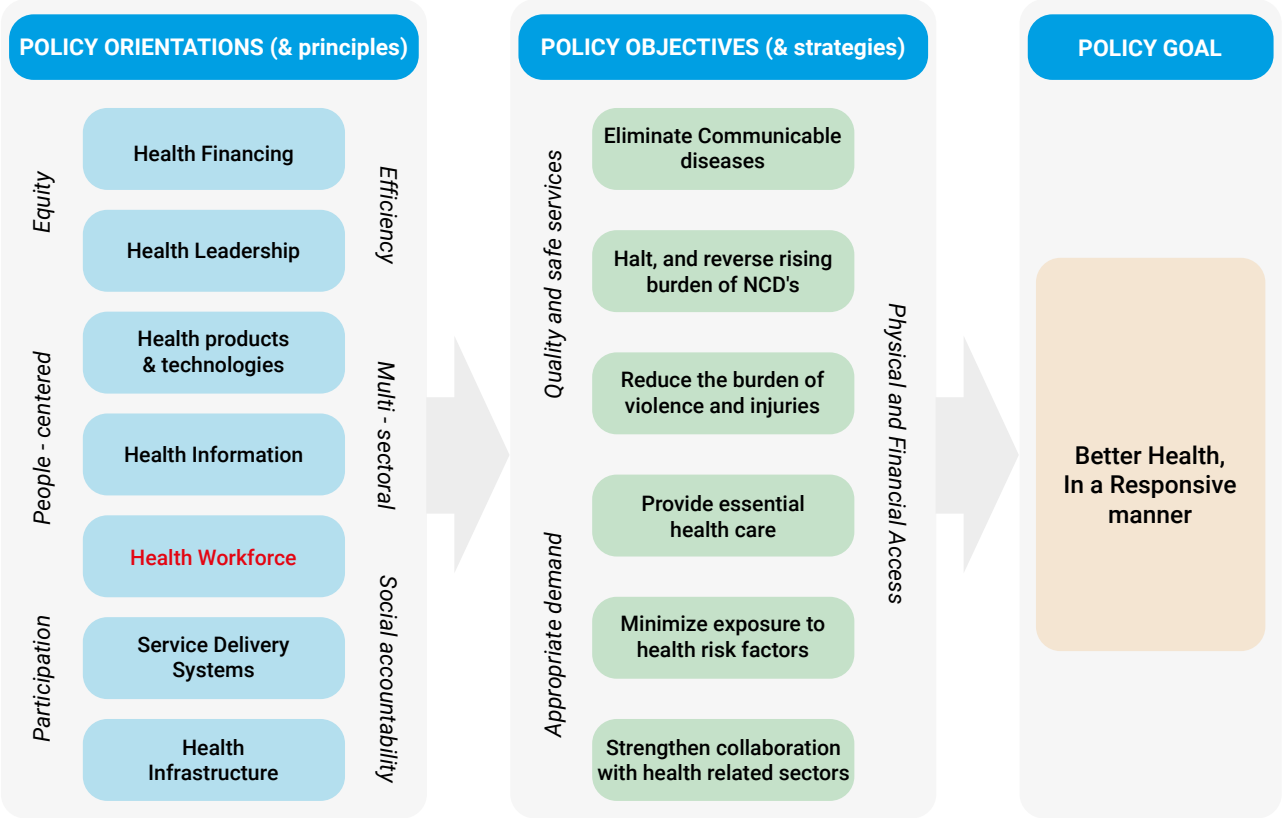
The health sector in Kenya is one with devolved functions according to the 4th schedule of the Constitution of Kenya 2010. The National government is responsible for formulating health policies and managing the national referral health facilities. It is also responsible for building the capacity and providing technical assistance to counties. County governments are responsible for:

- Managing county health facilities and pharmacies
- Managing ambulance services
- Promoting primary health care
- Licensing and control of undertakings that sell food to the public
- Veterinary services (excluding regulation of the profession)
- Cemeteries, funeral parlours and crematoria; and
- Refuse removal, refuse dumps and solid waste disposal.
- Health workforce recruitment and deployment

In line with its mandate, the Ministry of Health (MOH) developed and adopted the Kenya Health Policy, 2014–2030 and Kenya Health Sector Strategic Plan, 2018–2023 which draw direction from the Kenya Vision 2030 to outline the health sector's long, and medium-term strategic goals and milestones[10]. Figure 4 summarises the strategic orientation of the Kenyan health system up to 2030. As efforts are made towards achieving the policy goal, a well-motivated and equitably distributed health workforce at all levels of health is crucial and must be the pivot of all initiatives and investments in the sector.

9 Kenya National Bureau of Statistics (2019). 2019 Kenya Population and Housing Census.
10 Kenya Health Policy 2014-2030

Figure 4: Policy orientation of the Kenyan health system, 2014–2030



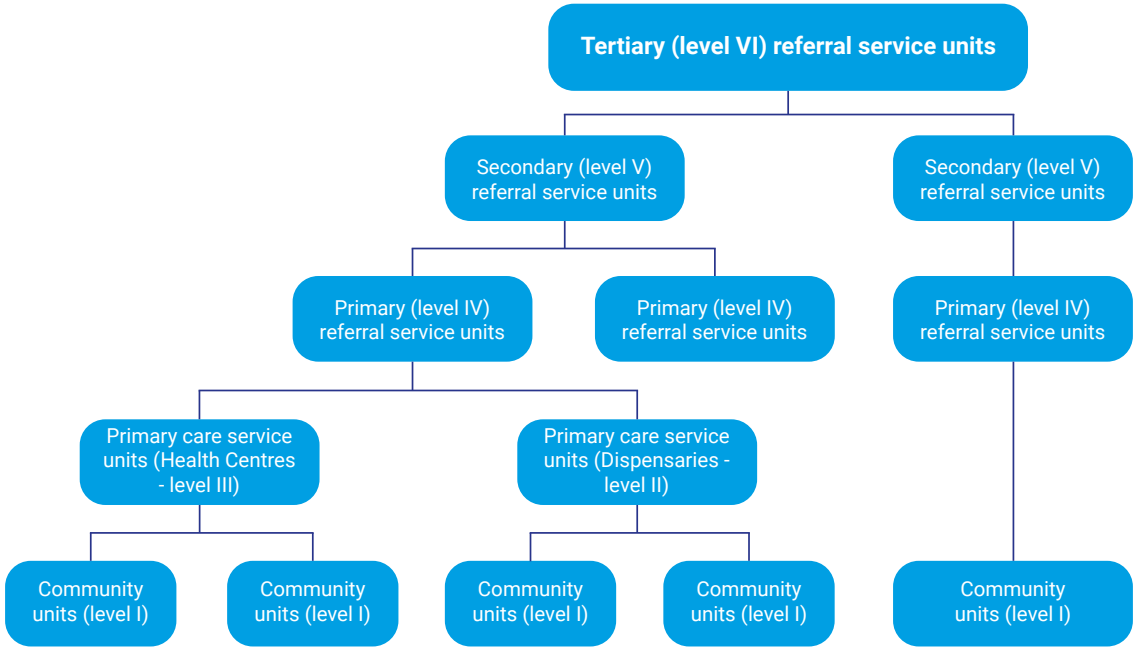
Source: *Kenya Health Policy 2014-2030*

1.5 Organization of Health

Kenya's healthcare system is structured in a hierarchical manner into six (6) service delivery levels (see Figure 5). It begins with primary healthcare, with the lowest unit being the community-based services (level 1), dispensaries (level 2), health centres (level 3), county/district hospitals (level 4), county referral hospitals (level 5) and finally the national referral hospitals (level 6). As of 2020, there were 13,372 health facilities in Kenya from levels 2- 6 across the public and private sectors (see Table 2). The deployment of health workers in the country also follows these organized service delivery levels, guided by the national norms and standards developed by the Ministry of Health[11]. Currently the government is reorganising healthcare delivery systems with the establishment of Primary care networks (PCNs) using a Hub and spoke model to address PHC from level 1 to 4 for the achievement of UHC. The PCNs will be organised through the multi-disciplinary teams.

11 Kenya Health Sector Strategic Plan 2018-2023

Figure 5: Levels of health service delivery institutions in Kenya



Source: *Kenya Health Sector Strategic and Investment Plan (KHSSP) for July 2014–June 2017*

Table 2: Health facilities in Kenya, 2022

KEPH Levels	Public	Private	Faith Based Organizations (FBOs)	Total
L2(Dispensaries and Medical Clinics)	4807	4832	1044	10683
L3(Health Centres)	1123	786	258	2167
L4 (Sub-County and County Referral Hospitals)	360	405	119	884
L5 (Regional Referral Hospitals)	14	4	5	23
L6 (National Teaching and Referral Hospitals)	5	0	0	5
Total	**6309**	**6029**	**1429**	**13762**

Source: *Kenya Master Facility List (KMFL)*

1.6 Health workforce context

In implementing the Kenya Health Policy, 2014–2030 and the Kenya Sector Strategic Plan, 2018–2023, Kenya Human Resources for Health Strategic Plan (KHRHSP) 2019-2023 was developed to guide and direct interventions, investments and decision-making in the planning, development and management of health workforce (HWF) at national and county government levels, including the faith-based institutions and the private sector. The strategic plan envisions a “Transformative

HRH systems efficiently supporting quality service delivery through four strategic investment priorities (SIPs) namely:

a. Re-engineered health workforce management for universal health coverage
b. Transformative health workforce capability building
c. Strengthened HRH database through national health workforce accounts (NHWA)
d. Responsive HRH leadership and management systems.

1.7 Rationale/Justification of the Health Labour Market Analysis

In the recent past, Kenya has made local and international commitments to improve health care in the country, such as attainment of UHC. The Kenya Health Policy 2014-2030, health-related Sustainable Development Goals, Global Health Security, Kenya Human Resources for Health commitments 2013, amongst others. Following this, efforts geared towards improving access to health services, including expansion and upgrading of health facilities, equipping health facilities with modern diagnostic and training equipment, improved access to services through initiatives such as Linda mama, Beyond Zero, enhanced provision of community health services through primary health care, and health insurance subsidies have been realized.

However, all these strategic investments require a competent and committed health workforce of the appropriate skills mix, adequate number and appropriate distribution. In Kenya, challenges have led to inefficiencies in the sector, watering down the gains made. These include:

a. Weak human resource for health coordination among county governments and between national and county levels of government[12], inadequate management and leadership

12 Thuku MK, Muriuki J, Adano U, Oyucho L, Nelson D. Coordinating health workforce management in a devolved context: lessons from Kenya. Hum Resour Health. 2020 Mar 30;18(1):26. doi: 10.1186/s12960-020-00465-z. PMID: 32228587; PMCID: PMC7106797.

1. Tsofa B, Goodman C, Gilson L, Molyneux S. Devolution and its effects on health workforce and commodities management - early implementation experiences in Kilifi County, Kenya. Int J Equity Health. 2017 Sep 15;16(1):169. doi: 10.1186/s12939-017-0663-2. PMID: 28911328; PMCID: PMC5599882.
2. Vujicic M, Zurn P. The dynamics of the health labour market. Int J Health Plann Manage. 2006 Apr-Jun;21(2):101-15. doi: 10.1002/hpm.834. PMID: 16846103.
3. Makau-Barasa, L. K., Greene, S., Othieno-Abinya, N. A., Wheeler, S. B., Skinner, A., & Bennett, A. V. (2020). A review of Kenya's cancer policies to improve access to cancer testing and treatment in the country. Health research policy and systems, 18(1), 2. https://doi.org/10.1186/s12961-019-0506-2
4. Waters KP, Zuber A, Willy RM, Kiriinya RN, Waudo AN, Oluoch T, Kimani FM, Riley PL. Kenya's health workforce information system: a model of impact on strategic human resources policy, planning and management. Int J Med Inform. 2013 Sep;82(9):895-902. doi: 10.1016/j.ijmedinf.2013.06.004. Epub 2013 Jul 17. PMID: 23871121.
5. 3rd Global forum for Human resources on human resources for health. HRH commitments. Kenya https://www.who.int/workforcealliance/forum/2013/hrh_commitments_ken/en/ accessed 22nd November 2021
6. HRH Capacity Bridge Project . Strengthening human resources for health systems in Kenya: Rapid situation analysis report. Nairobi: IntraHealth International; 2014.
7. Miseda MH, Were SO, Murianki CA, Mutuku MP, Mutwiwa SN. The implication of the shortage of health workforce specialist on universal health coverage in Kenya. Hum Resour Health. 2017 Dec 1;15(1):80. doi: 10.1186/s12960-017-0253-9. PMID: 29191247; PMCID: PMC5710014.

capacity, inequitable distribution of health workers (geographical and level of care), inadequate financial resources for remuneration, low absorption of skilled health professional into the active workforce, inability to recruit additional health workers by some counties due to budget space rigidities.

b. Inadequate number of health workers, inadequate number of specialists and subspecialists, demotivated health workers, prolonged health workers strike, inadequate competence.

Amidst all these, the country needs robust and state-of-the-art evidence on all aspects of the health workforce, including current and anticipated supply viz-a-viz needs and demand, labour flows, the political economy, the HLM, efficiency, retention and economic space for sustainable health workforce investments into the future. These would form a basis for policy dialogue that would potentially unlock opportunities to optimise health workers' performance and increase investments to create decent jobs for the health workforce, especially for women and the youth.

1.8 Aim and Objectives of the Kenya Labour Market Analysis

The aim of the Kenya HLMA is to provide evidence-based information on the market dynamics that will be used to provide recommendations on the production of the health workforce, management and tracking on inflow and outflow of health workers, management and tracking on inflow and outflow of health workers and the regulation of service provision through a policy change.

The specific objectives are:

a. To undertake a descriptive analysis of the dynamics of supply and demand of health labour in Kenya

b. To develop a prediction of the normative need of the health labour force to address the disease burden/workload in Kenya

c. To conduct an exploratory analysis of required policy actions to address supply/demand gaps required to achieve the desired need and distribution for health workers in Kenya

d. To develop policy recommendations with regards to the production, inflows and outflows, maldistribution and inefficiencies, and regulation in Kenya

8. Riley PL, Vindigni SM, Arudo J, Waudo AN, Kamenju A, Ngoya J, Oywer EO, Rakuom CP, Salmon ME, Kelley M, Rogers M, St Louis ME, Marum LH. Developing a nursing database system in Kenya. Health Serv Res. 2007 Jun;42(3 Pt 2):1389-405. doi: 10.1111/j.1475-6773.2007.00715.x. PMID: 17489921; PMCID: PMC1955370.
9. North N, Shung-King M, Coetzee M. The children's nursing workforce in Kenya, Malawi, Uganda, South Africa and Zambia: generating an initial indication of the extent of the workforce and training activity. Hum Resour Health. 2019 May 7;17(1):30. doi: 10.1186/s12960-019-0366-4. PMID: 31064414; PMCID: PMC6505296.
10. Kiambati, H, Kiio, C & Toweett, J 2013, Understanding the labour market of human resources for health in Kenya, World Health Organisation, Geneva, viewed 23 Nov 2021, <http://www.who.int/hrh/tools/Kenya_final.pdf?ua=1>.


Ministry of Health
World Health Organization
Certificate
Awarded to
Dr. Mona Almudhwahi
for facilitating the training on
Health Labour Market Analysis (HLMA)
Nakuru, Kenya, 6 – 17 September 2021
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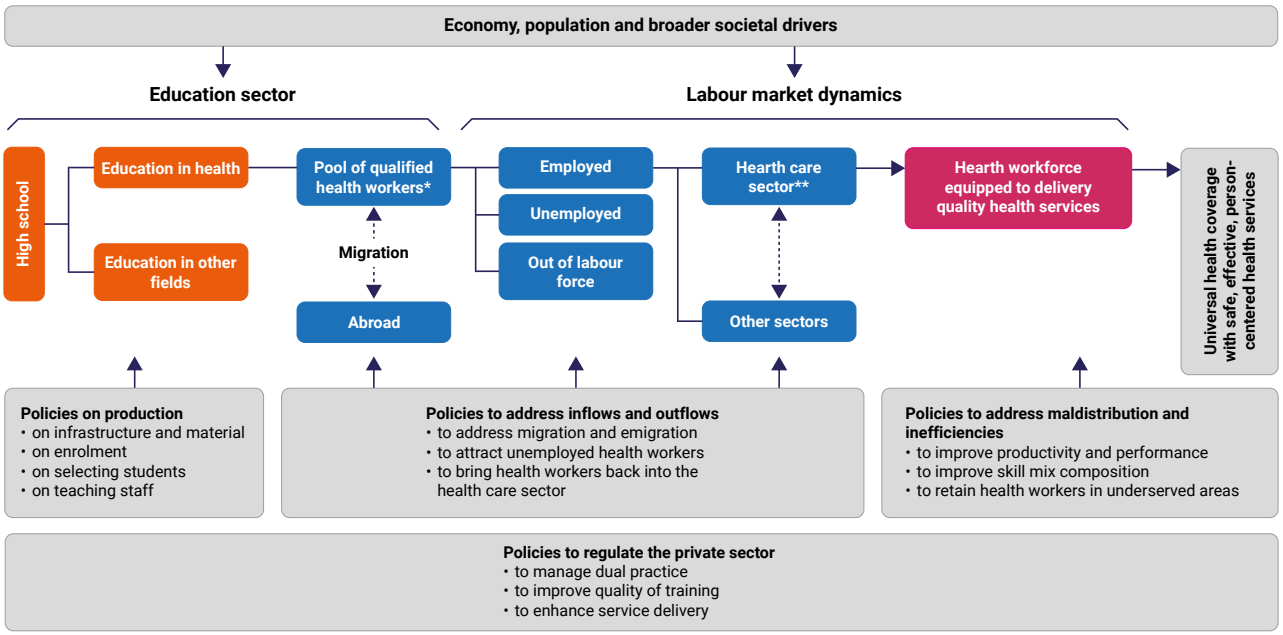
Section 2

2. IMPLEMENTATION PROCESS AND TECHNICAL METHODOLOGY

2.1 Conceptual Approach for HLMA

The health labour market analysis provides insights into the health labour market dynamics and points out areas of prevailing or potential labour market failures or mismatches for corrective policy actions. The health labour market is dynamic and is influenced by policy decisions and actions across several sectors that include education, labour, finance, employment, foreign affairs (in relation to international migration) and health. The health labour market framework proposed by Sousa and colleagues (2013), which has been adopted by WHO (Figure 6), is a simple guide, and was adopted for analysing the core aspects of the health labour market in Kenya.

Figure 6: Health Labour Market Framework for UHC



Source: *WHO, 2016*

Building on previous works, a multi-method approach was used to collect and analyse data on the health labour market dynamics in Kenya. These included desk review, stakeholders' discussions (inception meetings, key informant and focus group discussions), triangulation of secondary data from multiple sources, descriptive analysis of existing quantitative data, workers survey and a group modelling exercise for the future outlook of need, demand and supply of the health

workforce. The Kenya HLMA was also largely guided by the recently published labour market analysis guidebook by the World Health Organization[13], the first in the African region.

2.2 Overview of the process of the HLMA in Kenya

2.2.1 Process of HLMA Implementation in Kenya

The government of Kenya prioritised conducting a comprehensive HLMA, which was divided into two main phases. The first phase focused on descriptive and predictive analyses using available secondary data and insights from some stakeholders whilst the second phase focused on exploratory analysis through primary data collection.

The first phase of the Kenya HLMA was implemented in a sequential approach as follows:

a. Conceptualization and Planning
b. HLMA Methodology Workshop and Planning for Data Collection
c. Descriptive Analysis and Predictive Labour Market Modelling
d. Report Writing, Validation and Consensus building

2.2.1.1 Conceptualization and planning

The MOH working with WHO developed the concept note and proposal for the implementation of the HLMA, which detailed the rationale, initial policy questions, cost and implementation timelines as well as mapping of key stakeholders to be engaged in the process.

To initiate the process of implementation, MOH set up a steering committee and a multi-stakeholder and interdisciplinary technical working group (TWG) with the former responsible for overall stewardship and guidance of the implementation while the TWG was responsible for day-to-day implementation including data collection, analysis and writing. The composition of the TWG was drawn from:

a. Ministry of Health Departments & Agencies, including HRH department, KHRAC, HIS, Disease Programs, Planning, and Intergovernmental relations.
b. Health Professional Regulatory Bodies
c. Ministries of Education,
d. Ministries of Finance
e. Ministries of Economic Planning,

13 World Health Organisation, Health Labour Market Analysis Guidebook (World Health Organisation, 2021) <https://apps.who.int/iris/handle/10665/348069> [accessed 15 November 2021].

f. Ministries of Labour,

g. The Civil/Public Service

h. Kenya National Bureau of Statistics

i. Salaries and Remuneration Commission

j. Private Sector

k. WHO – providing technical support

As part of the preparation, bilateral discussions were held with key stakeholders and decision-makers in the MOH and of other relevant institutions and development partners to explore their perspectives and expectations of the HLMA, which ultimately shaped policy questions for the study.

2.2.1.2 HLMA Methodology Workshop and Planning for Data Collection

The TWG was given a 5-day comprehensive training on HLMA methodology, guided by the WHO Health Labour Market Analysis[14]. It also offered an opportunity for the TWG to refine the proposed policy questions and set expectations on scope and approach. This then informed the type and nature of data required to address the identified policy questions. Based on the refined scope, members of the TWG were divided into task teams to conduct a preliminary assessment of the extent of data availability and gaps. This enabled the team to ascertain the suitability of the difference in the analysis and assumptions as may be necessary to address some of the identified questions.

In terms of data collection strategy, the data collection tools were developed and agreed upon, and specific areas were assigned to different task teams for data collection.

- **Task Team on Education Sector:** The team reviewed secondary data on how healthcare workers are produced. The main tasks were to; identify key stakeholders in health education and their role, assess the attractiveness of health professions relative to other professions, assess production capacity, review trends in the production of health workers and provide an overview of production efficiency.

- **Task Team on Stock and Supply:** Key roles assigned to this Task Team included measuring the supply in order to differentiate pool of health workers employed in the health sector, working outside the health sector, the unemployed and those who have migrated; to assess the Health Worker characteristics in terms of density, gender, age distribution, skills mix, geographical distribution and attrition and turnover rates. In addition, the team reviewed policies on salaries, assessed wages and other financial benefits relative to GDP per capita.

14 World Health Organization, Health Labour Market Analysis Guidebook (World Health Organization, 2021) <https://apps.who.int/iris/handle/10665/348069> [accessed 15 November 2021].

The non-monetary benefits and related policies were reviewed too. The team was also tasked with translating policy into action. This was done by identifying policy implications and making recommendations for interventions.

- **Task team on Demand:** The demand task team sourced for data on sum of established/ approved posts (indicative demand), effective demand or funded posts, the budget allocated to fill the posts, filled posts/ met demand, unmet demand or vacancies. In addition, the task team reviewed the established or approved posts that have remained vacant whether they are funded or not, the funded vacancies or labour shortages which represents the actual number of new employments that could be made within a period of time. There was, however, readily available data on these indicators which were then deferred to the second (exploratory phase) of the HLMA.

- **Task team on Macroeconomics, Policy and Planning:** Key roles of this team included assessing the importance and attractiveness of the health sector in terms of employment in comparison to other sectors. They also identified and reviewed the main funding components (Public, Private, external sources). The team also examined how funding sources influenced investments in the health workforce. Finally, they assessed how some key macroeconomic factors impact investments in the health workforce by identifying and reviewing key constraints such as wage bill ceilings, fiscal space, budget prioritization and public spending efficiency.

2.2.1.2 Descriptive Labour market analysis and Predictive Labour Market Modelling

2.2.1.2.1 Descriptive analysis of the size, composition and distribution of the health workforce

1. Analysis of current situation and past trends:

Various analyses were carried out to generate results for the various components of the HLMA, which are presented tables, graphs and/or textual description, as appropriate. The size, composition, and distribution of the health workforce in Kenya were analysed using descriptive statistics of the trends and contextually interpreted with the qualitative insights obtained from stakeholders to ensure consistency. Also, trend analysis was done to assess the health sector's contribution to the overall economic activity measured by the gross domestic product. This analysis entailed a graphical trend in proportional contribution of the entire health sector to the overall economic output of the country from 2011 to 2019. The data used in the analysis were obtained from the various issues of the Kenya economic survey reports.

Similarly, trend analysis was carried out on health sector employment as a share of overall employment in the country over the period from 2010 to 2020. Comparative analysis of employment in different sectors in comparison with the health sector in gauge attractiveness of the health sector.

2. Analysis of equity in the distribution of health workforce

In this report, a simple measure of health workforce distributional equity which has been used in several African countries[15] (HRH Geographical Equity Index), was adopted to explore the equity implications of the county distribution of the existing health workforce. In this approach, the county's share of the national population is used as a denominator, and their respective share of the public sector health workforce is used as the numerator, to derive a ratio known as the health workforce "Geographical Equity Index (GEI)" - see equation 1. In this instance, the equity index measures the county's share of the health workforce in relation to its share of the population (unadjusted for epidemiological, demographic or other geographical variables).

$$County\ GEI = \frac{County\ \%\ share\ of\ HWF}{County\ \%\ share\ of\ Population} \quad \ldots \text{equation 1}$$

However, the population variable can be replaced with a measure of disease burden or any other criteria for distribution as desired. With this approach, a perfectly distributed health workforce (an egalitarian distribution) will ideally yield a GEI of one (1), but higher GEI above 1 in a particular county reflects health workers distribution skewed in its favour and vice versa. A composite GEI was also determined as the ratio of the county with the highest GEI to the county with the lowest GEI, which explains the magnitude of the overall inequality between the best-staffed and the worst-staffed County.

3. Analysis of aggregate economic demand for health workforce

The demand analysis at macro level involved statistical analysis of the effect of gross domestic product (GDP) on employment in the public sector[16]. 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 health wage bill. A growing GDP also increases the ability of individuals and households to purchase healthcare in the private health sector. The analysis entailed the determination of whether or not GDP had any effect on employment using the equations shown below. The data used were obtained from the various statistical abstracts sourced from the Kenya National Bureau of Statistics, data covering the years 2007 to 2019.

$$log\ log\ (doctors) = ob_0 + b_1\ log\ log\ (first\ lag\ of\ GDP\ per\ capita) + b_2\ log\ log\ (lag\ of\ out\ of\ poacket\ health\ expenditure) + error\ term \quad \ldots \text{equation 1}$$

15 MOHS, Health Labour Market Analysis Report for Sierra Leone (Freetown: Ministry of Health and Sanitation, Sierra Leone, 2019); FMOH, Health Labour Market Analysis Report for Ethiopia (Addis Ababa: Federal Ministry of Health, Ethiopia, 2020); MOH, Health Labour Market Analysis Report for Lesotho (Maseru, Lesotho: Ministry of Health, Lesotho, 2021); MOH, Health Labour Market Analysis Report for Rwanda (Kigali, Rwanda: Ministry of Health, Rwanda, 2019); MOHSS, Human Resources for Health Situation Analysis - Health Labour Market Approach (Windhoek, Namibia: Ministry of Health and Social Services, 2019); James Avoka Asamani and others, 'The Cost of Health Workforce Gaps and Inequitable Distribution in the Ghana Health Service: An Analysis towards Evidence-Based Health Workforce Planning and Management', Human Resources for Health, 19.1 (2021), 43 <https://doi.org/10.1186/s12960-021-00590-3>.

16 Based on methodology by Liu, Goryakin , Maeda, Bruckner and Scheffler (2017). Global health workforce labor market projections for 2030. Human Resources for Health 15:11 DOI 10.1186/s12960-017-0187-2

These equations were used to project employment in the period 2021 to 2035.

2.2.1.2.2 Modelling the future supply and needs-based requirements for health workers

Some of key the policy questions identified for HLMA included:

a. How many health workers are anticipated to be in the labour in the future?

b. How many health workers will be needed to address the health needs of the population?

c. What is the HWF absorption capacity of the economy, and how many health workers can sustainability be employed in the future?

Addressing these questions necessitated a modelling exercise. In so doing, an empirical framework for integrated analysis of HWF supply, needs and economic feasibility (Figure 7)[17] and leveraged on its recently published simulation tool in Microsoft® Excel[18].

As health workforce modelling is complex and require multi-dimensional skills, the TWG worked with experts from various aspects of healthcare and from other sectors, including statisticians from Kenya National Bureau of Statistics, Economists from State Department of Planning, Epidemiologists, Public Health Experts, Clinicians from diverse backgrounds, Labour experts, Lawyers and Health Economists among others. A group modelling approach was adopted in which the team worked in smaller teams in a dedicated two-week working session, with guidance and technical support of WHO technical experts.

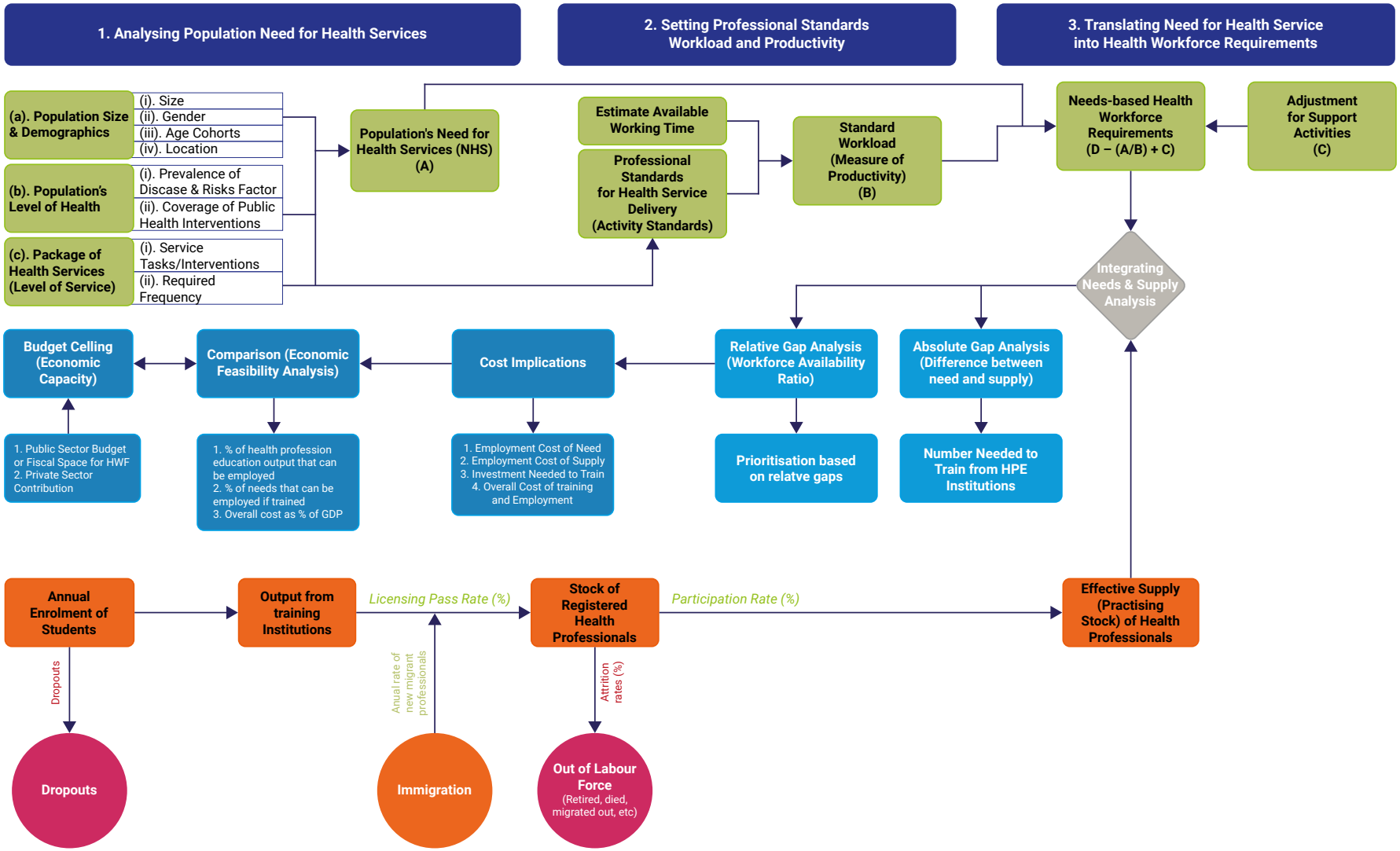
Three specific estimations were made for the (a) supply of health workforce, (b) the need-based requirements for health workforce and, (c) cost and economic feasibility. The technical methodology for these estimations has been adequately described elsewhere in literature[19], hence are briefly highlighted in this section.

17 James Avoka Asamani, Christmal Dela Christmals, and Gerda Marie Reitsma, 'The Needs-Based Health Workforce Planning Method: A Systematic Scoping Review of Analytical Applications', Health Policy and Planning, czab022, 2021 <https://doi.org/10.1093/heapol/czab022>.

18 James Avoka Asamani, Christmal Dela Christmals, and Gerda Marie Reitsma, '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 (2021), e0257957 <https://doi.org/10.1371/journal.pone.0257957>.

19 James Avoka Asamani, Christmal Dela Christmals, and Gerda Marie Reitsma, 'Advancing the Population Needs-Based Health Workforce Planning Methodology: A Simulation Tool for Country Application', International Journal of Environmental Research and Public Health, 18.4 (2021), 2113 <https://doi.org/10.3390/ijerph18042113>; James Avoka Asamani, Christmal Dela Christmals, and Gerda Marie Reitsma, 'The Needs-Based Health Workforce Planning Method: A Systematic Scoping Review of Analytical Applications', Health Policy and Planning, czab022, 2021 <https://doi.org/10.1093/heapol/czab022>; S Ahern and others, 'Needs-Based Planning for the Oral Health Workforce - Development and Application of a Simulation Model', Human Resources for Health, 17.1 (2019) <https://doi.org/10.1186/s12960-019-0394-0>; S Birch and others, 'Opportunities for, and Implications of, Skill Mix Changes in Health Care Pathways: Pay, Productivity and Practice Variations in a Needs-Based Planning Framework', Social Science and Medicine, 250 (2020) <https://doi.org/10.1016/j.socscimed.2020.112863>.

Figure 7: Framework for Need-based Health Workforce Planning



Source: *adopted from Asamani et al.*[20]

20 James Avoka Asamani, Christmal Dela Christmals, and Gerda Marie Reitsma, '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 (2021), e0257957 <https://doi.org/10.1371/journal.pone.0257957>.

1. Health workforce supply forecast:

Building on the stock and labour flows information on the health workforce (see section 2 of this report), the future supply of health workers was projected using a stock-and-flow methodology as shown in equation 2.

Box 1: Stock and flow formulae for HWF Supply Projection

$$S_{(n,t)} = [T_{(n,t-1)} \times (1 - a_n) + I_n] \times P \quad \text{... equation 2}$$

Where:

- $S_{n,t}$ is the supply of health worker of category ***n***, at time ***t***.
- $T_{n,t}$ is the aggregate stock of health worker of category ***n*** at time ***t***.
- a_n represents the attrition rate (a proportion of the stock, $T_{n,t-1}$ that died, retired, could not work due to ill-health or migrated out).
- I_n is the inflows of health worker of category ***n*** trained domestically or immigrating from another country.
- ***P*** is the labour participation rate or the proportion of the health workers willing to engage in professional practice.

Sources: *adapted from Asamani et al.*[21]

2. Modelling the Need-based requirements for health workers:

There are several methods for determining the 'needed' health workforce in a country[22], but the Global Strategy on Human Resources for Health recommends a need-based approach that aligns investments to population health needs[23]. The health need-based or epidemiology approach was adopted with the assumption that the need for health workers in Kenya depended on the 'need for health services' as defined by the disease burden and structure of the population alongside the health service delivery model of the country[24]. The following technical steps were followed to determine the need for health workers.

21 James Avoka Asamani, Christmal Dela Christmals, and Gerda Marie Reitsma, '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 (2021), e0257957 <https://doi.org/10.1371/journal.pone.0257957>.

22 Sharma Kavya and others, 'Methodological Issues in Estimating and Forecasting Health Manpower Requirement', Journal of Public Administration and Policy Research, 6.2 (2014), 25–33 <https://doi.org/10.5897/JPAPR2011.067>.

23 WHO, 'Global Strategy on Human Resources for Health: Workforce 2030', World Health Organization, 2016 <https://www.who.int/hrh/resources/globstrathrh-2030/en/.>.

24 Stephen Birch and others, 'Health Human Resources Planning and the Production of Health: Development of an Extended Analytical Framework for Needs-Based Health Human Resources Planning', Journal of Public Health Management and Practice, 15.Supplement (2009), S56–61 <https://doi.org/10.1097/PHH.0b013e3181b1ec0e>; G Tomblin Murphy and others, 'Planning for What? Challenging the Assumptions of Health Human Resources Planning', Health Policy, 92.2–3 (2009), 225–33 <https://doi.org/10.1016/j.healthpol.2009.04.001>.

- ***Estimating the Populations' 'Need for Health Services':*** It was prioritised to quantify the 'need for health service' that covers at least 95% of the burden of diseases and risk factors. Using data from the country's health information system, the list of diseases and risk factors that account for 95% of morbidity and mortalities were identified. A desk review was then conducted by a team of epidemiologists and statisticians to obtain the prevalence rates of the diseases and risk factors, as well as the targets of the coverage rates of priority public health interventions. The disease burden and the risk factors were mapped based on health facility attendance from the routine Health information from the Kenya Health Information System (KHIS), Kenya Demographic Health Survey (KDHS), Kenya Household Survey, Mid Term Review of the Kenya Health Sector Strategic Plan. Desk review of various prevalence estimates from the latest peer-reviewed scientific journals and the Kenya Health policy 2014-2030. A separate team of clinical experts were divided into three groups – Communicable diseases (CD) team, Non-Communicable disease (NCD) team, and Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCAH) team who worked together to identify the planned or otherwise necessary health intervention to address each of the diseases and risk factors identified as well as the health worker occupational group that has the competency. The team also identified the appropriate population cohorts (demographic groups, gender, and location) that will benefit from the interventions (services). These clinician-led works were put together to compute the needs-based service requirements using equation 2.

- ***Translating the Need for Health Service into Needs-based staffing requirements:*** Leveraging on past and ongoing WISN studies in Kenya and augmented with experience and from other countries in the region, a standard workload was determined for each of the health interventions identified by the clinical expert teams (see equation 3). A standard workload, which is akin to a measure of productivity, is defined as the volume of work within one health service activity that one health worker can accomplish within a year to acceptable professional standards[25]. The estimated "need for health services' was then translated into health workforce using the standard work (see equation 4).

25 WHO, 'Workload Indicators of Staffing Need - User Manual', 2010 <http://apps.who.int/iris/handle/10665/44414> [accessed 11 October 2015].

Box 2: Needs-based Health Workforce Requirements

$$NHS_t = \sum P_{i,j,g,t} \times [H_{h,i,j,t-1} \times (1 + R_h)] \times L_{y,h,i,j,t} \quad \text{... equation 3}$$

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.
- Pi,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 the health status, h.

$$SW_{n,y} = \frac{AWT_n}{SS_{y,n}} \quad \text{... equation 4}$$

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.

$$\textit{Needs-based HWF requirements}_{n,y} = \frac{NHS_{n,y,t}}{SW_{n,y}} \quad \text{... equation 5}$$

Where:

- NHS_t represents the number of needed health service activity y, to be delivered by a health professional of category n at time t.
- $SW_{n,y}$ is the standard workload for health professionals of category n when performing health service activity y.

Source: Adopted from Asamani et al. 2021

3. Forecasting budget space for the health workforce

The economic demand for health workers is reflected in a country's ability and willingness to pay for health workers in its efforts to meet the health need of the population[26].

Thus, aggregate demand is an estimate of the joint financial capacity of the Government, development partners and the private sector in purchasing health care services, of which the cost of health workers' wages represents a substantial proportion. The assumption underlying this approach is that countries (governments and partners) will not necessarily spend on healthcare more than they can afford, even if their health or level of health utilisation is suboptimal relative to an internationally established metric by Scheffler and others. Therefore, demand for health workers can be gauged using fiscal space for the wage bill as a proxy and adjusting for the private sector contribution to HWF employment (equation 6). Analysis of the health sector budget was undertaken to gauge the level of prioritisation of the HWF within the successive budgets.

Box 3: Fiscal and Financial Space Assumptions

Public Sector HRH Fiscal Space for the year,

$$i = (\text{GGHE as \% GDP}_i * \text{Nominal GDP Values}_i) \times \text{HRH Expenditure as \% GGHE}_i$$

… equation 6

Cumulative Financial Space for the year,

$$i = \text{Public Sector Fiscal Space}_i \times (1+\text{proportion of private sector HRH employment})$$

… equation 7

Where:

- **i = target year**
- **GGHE = General Government Health Expenditure**
- **GDP = Gross Domestic Product**

Notes: *It was conservatively assumed that if the Government continued to spend a similar proportion of GDP on health and a similar proportion of GGHE on HRH, all other things being equal, the fiscal space for HRH would be proportional to the size of the GDP. It was further assumed that the private sector would not contract and that a conservatively similar proportion of private-sector employment would continue.try.*

Source: *WHO, 2021*

2.2.1.4 Report writing, Validation and Consensus Building

The technical working group, with guidance from experts from WHO held a 5-day working session to develop the main points of the report and to address data gaps and inconsistencies where necessary. A zero draft report was then developed and shared for preliminary review and comments refinements. A five -day technical and stakeholder review and validation workshop

26 Health Labor Market Analyses in Low- and Middle-Income Countries: An Evidence-Based Approach, ed. by Richard M. Scheffler and others (The World Bank, 2016) <https://doi.org/10.1596/978-1-4648-0931-6>.

was held to discuss the data and findings in terms of accuracy and appropriateness, whereupon recommendations and concrete policy actions was finalised and submitted to MOH with the view of convening a multisectoral, multi stakeholders dialogue on health workforce investment.

2.2.2 Data Sources, validation and quality assurance

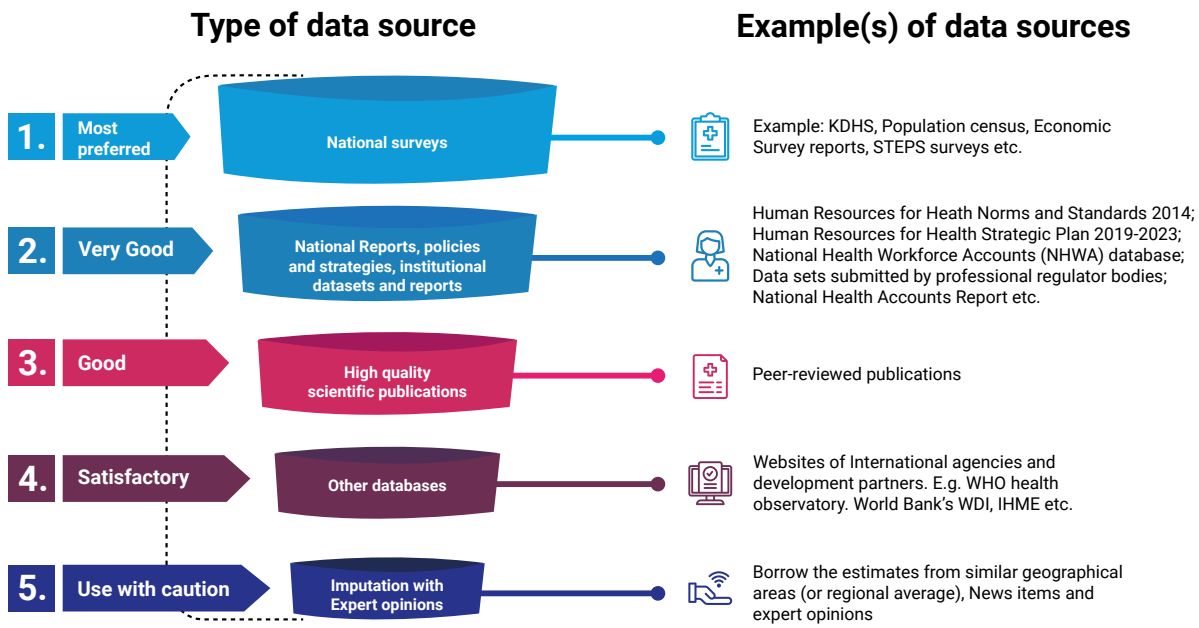
The desk review predominantly relied on the following sources of data.

a. Economic Surveys - 2000-2021 by Kenya National Bureau of Statistics (KNBS)
b. Kenya Demographic and Health Survey reports
c. Budget Performance Review reports by Controller of Budget
d. Midterm review report of Kenya Health Sector Strategic Plan (KHSSP) 2018-2023
e. Human Resources for Health Norms and Standards 2014
f. Human Resources for Health Strategic Plan 2019-2023
g. National Health Workforce Accounts (NHWA) database
h. Datasets submitted by professional regulator bodies.
i. Kenya Master facility List by Ministry of Health.
j. National Health Accounts Report including draft for 2021
k. Kenya population and housing census report and projections, 2019
l. Kenya Health Information System database
m. Kenya Essential Package of Health services
n. Peer-review publications on health workforce or disease burden in Kenya.
o. News items and expert opinion (used sparingly).

To uphold the quality of analysis and facilitate concurrent data quality assurance, the analysis and interpretation of data were undertaken jointly by WHO technical experts and a multi-stakeholder, interdisciplinary TWG constituted by the MoH technical team. A two-week data analysis workshops (one week each for descriptive analysis and group modelling exercise) were held.

Additionally, other mechanisms of data validation were put in place at various stages to ensure that the data identified and used in the analysis are valid, consistent and acceptable. A predefined data collection tool (in excel template) was jointly developed for data collection which was shared ahead of analysis for quality review by the WHO team. To ensure only data from trusted sources were used, a hierarchy of data sources was adapted from a previous HLMA (Figure 8).

Figure 8: Hierarchy of data sources used in the analysis



Source: *Adapted from HLMA Zimbabwe report*[27]

2.3 Phase II-Exploratory Phase

2.3.1 Study design

A cross sectional study design was used to explore the phenomenon to explain the observed patterns of the health labour market from the descriptive and predictive phase and at that point in time. The unit of analysis for the analysis was at both the individual health worker and the institutions that influence/ determine the health labour market aspects of interest. For the latter, the focus was on the counties and health facilities which employ the health workers. In subsequent sections, we present the approach to identifying the section of the representative unit of analysis used in the study.

2.3.2 Sampling

Based on our defined units of analysis, the approach to sampling was aimed at identifying the number of health workers from a set of health facilities within sampled counties. Multi-stage sampling methods were used as units of analysis for the study. The total number of health workers surveyed was 400. This was based on an assumption of 95% confidence level and -/+5% level of precision(equation 8). This was adjusted using the finite population correction for proportions (equation 9) where n is the sample size estimated in equation 1 and N is the estimated total number

27 MOHCC, Health Labour Market Analysis for Specialists Health Professionals in Zimbabwe (Harare: Ministry of Health and Child Care, Zimbabwe, 2021).

of health workers employed in health facilities in Kenya. These health workers were selected from the health facilities across the sampled counties.

$$n_o = \frac{Z^2 pq}{e^2} \quad \text{… equation 8}$$

$$n = \frac{n_0}{1 + \frac{(n_o - 1)}{N}} \quad \text{… equation 9}$$

In identification of counties to study, a sampling criterion previously proposed for assessing district health systems in the WHO/AFRO region (Sambo et al, 2003) was adopted. Based on this approach, the sample to be selected was based on selecting the proportion (%) of the total population (N) under consideration. In this case, the total population is the number of counties in Kenya. Given that Kenya has 47 counties (i.e., within 40-59), 30% were sampled. The resulting sample was in the range of 12-18 counties. A sample of 16 counties was selected across all the 10 regions of the country with purposive representation of urban/rural within each of the regions.

Having selected the counties, the Sambo et al. approach was used to estimate the number of selected health facilities. The Kenya Health Facility Master List has 15,523 health facilities (as of April 30, 2022). The selected counties represent more than 30% of the facilities in Kenya.

The sampling of facilities reflected the hierarchical/organizational structures, level of service and ownership distribution of health facilities within the selected counties. The representation of the different cadres was factored in the selection of the levels of care. In summary, the sample was as follows:

- Number of counties - 16
- Number of facilities per county - 5 (proportional split by ownership) - within the selected counties, there is almost equal proportion split between public and private (including FBOs).
- Selection of facilities ensured both public and private sector are selected.
- Levels of care - 4
- Number of health workers per facility - 5 (representation by cadre)
- Total = (16 x 5 x 5) =400

The target respondents per county were 25. The overall response rate was (93%), with Kericho and Isiolo achieving 25 (100%), followed closely by seven other counties at 24, (96%) and two counties at 23, (92%). Kirinyaga and Kitui recorded the lowest response, 21, (84%).

2.3.3 Data collection procedure

a. Institutional level data: Institutional perspectives were collected from the County Department of Health, and the health facility in charge. At county level, the target respondent was the Chief Officers for Health, County Director for Health and the officer responsible for HRH. At the health facility, the data collectors interviewed the health facility in charge and other officers responsible for managing health care workers at health facility level.

b. Individual level data: Individual data was collected using a set of standardised tools known as the health worker survey tool for exploratory health labour market analysis.

The questionnaires were administered in an electronic format through Organization Network Analysis (ONA) survey forms. ONA is an open-source platform that allows users to design questionnaires and upload them on the platform. The questions are accessed through a system generated web page link. Upon submission of the responses, data is then safely stored on the cloud platform for downloading on a need basis.


Certificate

Section 3

3. THE POLITICAL ECONOMY AND MACROECONOMIC FACTORS INFLUENCING THE HEALTH LABOUR MARKET

3.1 Overview of the Political Economic Context of Health Labour Market in Kenya

3.1.1 Stakeholder mapping

The changes in the broader political and economic processes and decisions have an effect on what happens in the demand and supply of labour in the health sector. This makes political economy analysis central to design, adoption and implementing policies that are aimed at changing or adjusting the structure of the health labour market. The Government of Kenya has committed to providing Universal Health Coverage under the presidential "Big Four" agenda as part of socio-economic transformation by providing equitable, affordable and quality health care of the highest standard to all Kenyans. Achieving this strongly depends on having a functional labour market that ensures a match between need, supply and demand.

In Kenya, HRH policies and decisions result from the interaction of numerous actors at National government, County government and international community each with their own objectives and interests. Following devolution (see next section), the Kenya public health sector workforce is managed at two levels. At national level, health workforce policies and their implementation are implemented by the Ministry of Health. For the health care workers who are devolved, all the Human resource management functions including recruitment, deployment, payroll management and even release for training is handled by county governments through their respective County department for health and Public Service Boards (PSB).

Table 3 presents a mapping of the different stakeholders and their position on the broader health labour market. It is important to note that specific stakeholder interventions are often around the interaction of both the demand and supply and the mismatches that arise therein. The different stakeholders mapped have a role in the production and management of health workers.

Table 3: Mapping of stakeholders and their interests in the health labour market in Kenya

	Stakeholder	Priority/Objective
National Level	Parliament/Senate	Legislation and oversight
	Ministry of Health	Health policy management and regulation
	National Treasury including Office of the Controller of Budget and Office of the Auditor General	Planning, budgeting, execution and reporting to enable implementation of the policies
	Ministry of Labour	Harmonious Industrial relations National Human resource planning and development, Industrial relations management, Occupational Health and management, National labour employment and policy management Labour productivity and competitiveness
	Ministry of education	To provide, promote and coordinate quality education, training and research
	Employers (Public and Private)	Provide employment, Training and Health services
	Insurers (Public and Private)	Provide insurance services for health sector
Sub-national (County)	County government	Manage county level health services
	Development Partners	Bring a pool of resources for the development of the sector.

3.1.2 Effect of Health workforce decentralization

The purpose of decentralization of the health workforce was to bring health services closer to the general population. This came with opportunities and challenges for the county governments. With the decentralization, counties had an opportunity to prioritize the health budget to suit the specific county health needs. Among the challenges encountered were, the seamless devolvement of financial resources to the grass roots, specialized skills development in the county and rationalization of human resource functions. The national and county governments responded to this and identified interventions and strategies to resolve the issues. Some of the these included, improved coordination through the Intergovernmental Forums; development of guidelines for devolved HRH which were aimed at providing guidance on county health workforce recruitment and deployment and an incentive framework for attraction and retention of health workers; and prioritization of the HRH by the counties as outlined in the County Health Strategic Plans

Due to these interventions, the country has harnessed gains in the sector such as improved leadership and governance at the county level and sub-county levels, institutionalization of the integrated human resource information system in all the counties, an increase in the recruitment of health care workers and specialists in the counties.

3.2 Macroeconomic Factors Influencing the Health Labour Market

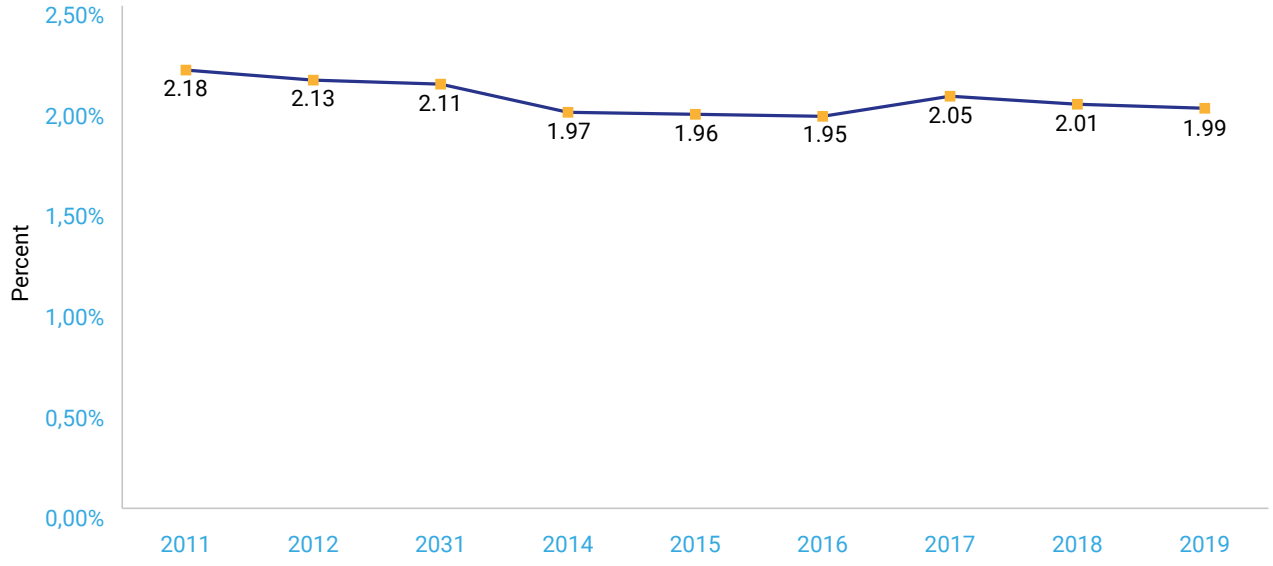
This section presents an overview of the attractiveness and importance of health sector as a source of employment in the Kenyan economy.

3.2.1 Attractiveness and importance of health sector employment

3.2.1.1 Trend analysis of the health sector's contribution to the GDP

The health sector has been contributing approximately 2.04% of the country's GDP. Using 3-year moving averages to smoothen the data, the results show a fluctuating health sector's share of GDP with the ranges of 1.95% to 2.18%. The seeming small contribution of the health sector to GDP is even on a downward trend, decreasing by 11.8% between 2011 and 2019 (1.3% decrease per year) – see Figure 9. Particularly, there was a marked decline between 2014 and 2016, a period that coincided with the start of the implementation of devolution, where health services were devolved to the counties and there was a notable increase on resources allocated to health. Although there is no evidence that links the observed declines to the processes or outcome of devolution, it signals an urgent need for a comprehensive productivity analysis of the health sector – both at the system and individual levels across public and private sectors to identify opportunities to boost the output of the sector and increase its share of GDP. This will be necessary strengthen the case for additional investment in the heath sector, especially for the health workforce.

Figure 9: Health sector contribution to GDP (%) – smoothened using 3-year moving averages

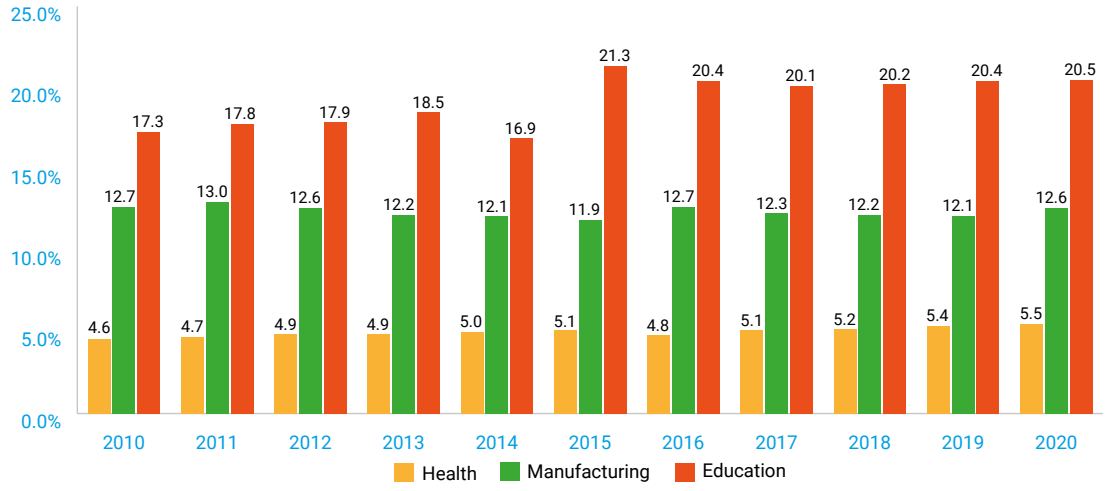


Source: *Triangulated from economic surveys from Kenya National Bureau of Statistics, various years.*

3.2.1.2 Health sector employment as a share of overall employment within the economy

Despite the decreasing trend in the health sector's share of the GDP, its share of the overall formal employment in the economy has generally been on a positive growth trajectory, increasing by 20% from 4.6% of the overall employment in 2010 to 5.5% in 2020 (see Figure 10). Figure 10 shows that the contribution of education and manufacturing sector is significantly higher than that of the health sector. For instance, in the last five years, the education sector accounted for about 20% of total formal employment in the country while the manufacturing sector contributed about 12% compared with only 5% by the health sector.

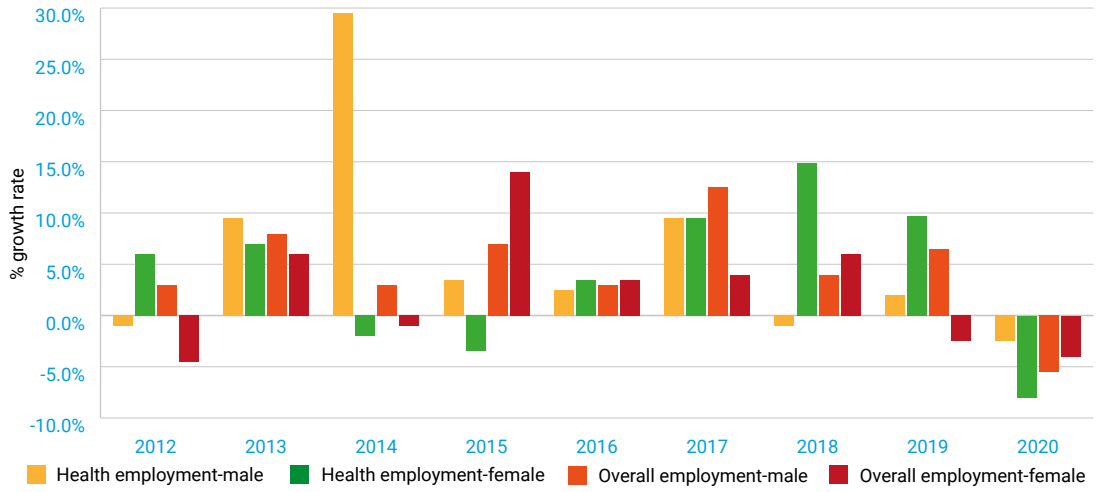
Figure 10: Employment in health sector versus the manufacturing and education sectors, 2010–2020



Source: *Authors based on economic surveys from Kenya National Bureau of Statistics.*

Figure below shows trends in the growth rates of employment by sex in the health sector in comparison with overall employment in the formal sector in the country.

Figure 11: Trends in growth rates in employment by sex



From 2016 to 2019 the growth of employment of female health care workers was higher than the growth of overall employment of females in the formal sector. Additionally, in 2012 just before the implementation of devolved system of governance, the growth rate of employment of female in the health sector was higher than all sectors put together. However, for the period between 2013 and 2015 there was a steady decline in the growth of employment of females in the health sector while that of overall employment of females decreased between 2013 and 2014 an increase between 2014 and 2015 and thereafter had a decline in trend.

As demonstrated from the preceding paragraphs, health sector contribution to GDP is of relatively small importance, similar with its size relative to the overall formal employment. Nevertheless, the health sector employment has been placed high on the policy agenda. For instance, the Government is implementing fiscal consolidation measures with an associated four-year freeze in public sector employment. However, the health sector has been exceptionally exempted from this employment freeze (over 4 years, 2020-2024) as it is considered an important social sector worth consistent investment.

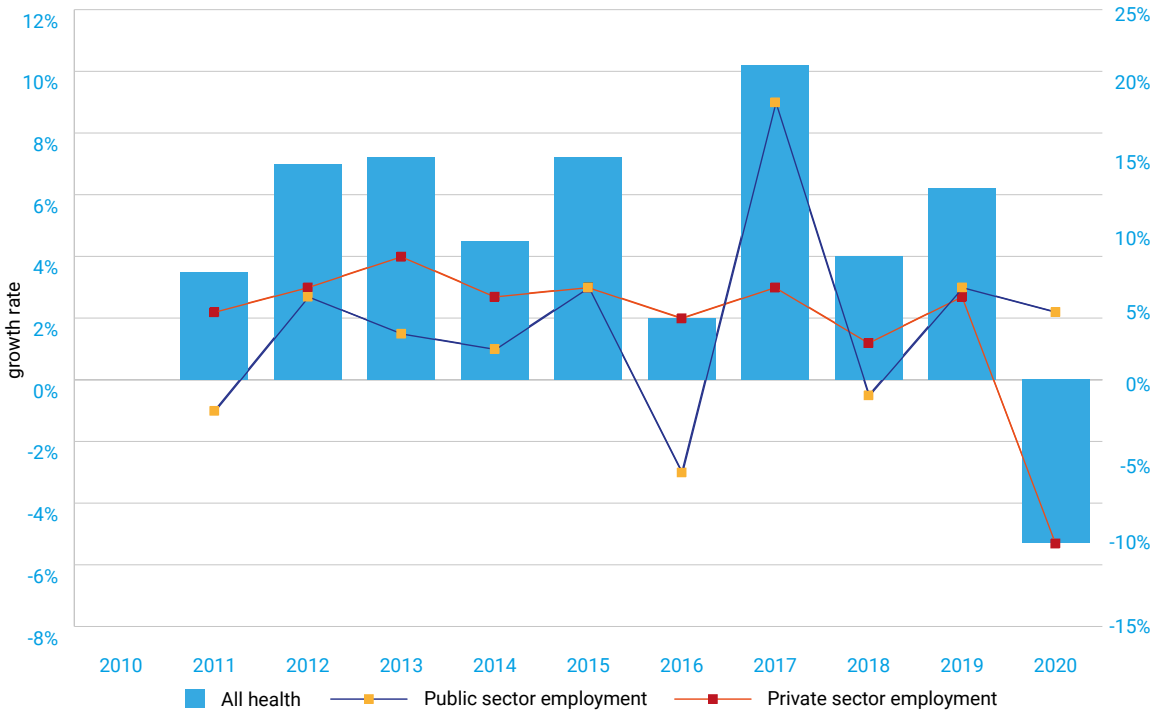
3.2.1.3 The Role of the Private Sector in Health Employment in Kenya

As demonstrated in Figure 12, the private sector has been a key driver of employment in the health labour market with an average growth rate of 7% per annum as compared to 4.1% annual rate of growth from the public sector. The public sector appears to experience a cyclical pattern of growth interspersed with depression every 3-4 years. There was a marked increase in employment in the public health sector in 2017 by 20% as compared to the previous year, mainly stemming increased salaries resulting from pressure from healthcare workers strikes and also increased recruitments as part of efforts for UHC targets attainment. In 2018 the growth rate in employment reduced because of three reasons; first, the ministry froze employment to address succession management issues, secondly, due to the massive employment in the previous year 2017. Thirdly, County public service boards became operational and reduced hiring at the county level. In 2016, there was a negative growth rate due to a freeze on employment to undertake capacity assessment and rationalisation of the public service (circular 8th august 2018)[28]. In 2020 the public sector employment remained almost constant because of additional employment due to COVID 19 response. Increase in the growth rate in 2019 was mainly due to additional recruitment for UHC. It is important to mention that although the private sector drives health employment in Kenya, some categories of health professionals remain predominantly employed in the public sector (see section 4 for the sector distribution of current stock of health workers, disaggregated by occupations)

It is also worth noting that for the first time in 10 years, the private sector health employment recorded a negative growth of -10% which is attributed to the adverse impact of COVID-19 pandemic on the economy. Although the public sector employment was increased by 6%, the overall health sector employment declined by 5% in 2020, implying that roughly 9,900 health workers who were previously employed became possibly unemployed or underemployed – largely driven by the private sector decline.

28 Government of Kenya (2018). Capacity assessment and rationalization of public service (CARPS). Retrieved from https://www.ghris.go.ke/Docs/CARPS%20Frequently%20Asked%20Questions%20(FAQs).pdf

Figure 12: Annual growth rate in health sector employment



Source: *Authors based on economic surveys from Kenya National Bureau of Statistics.*

3.2.1.4 Relationship between GDP and the overall Health Sector Employment in Kenya

The literature[29] and normative guidelines[30] demonstrate that GDP per capita is the most reliable predictor, at the macro level, of the ability of the country spend more on health, including the employment of health workers. To examine the degree to which changes in the GDP per capita (in order to account for changing population size) in Kenya is associated with changes in health employment across the public and private sectors, a linear model was fitted (see methodology section for details on the model fitting).

Table 4: Effect of GDP on employment

Variable	Coefficient	Std. Error	t-Statistic	P-value
Log of GDP per capita	1.4278	0.2895	4.9319	0.0006
Log of current health expenditure per capita	0.0077	0.1492	0.0517	0.9598
Intercept	-9.4608	1.4948	-6.3293	0.0001

Model summary: adjusted R-square = 0.98, F-statistic = 229.85, Prob(F-statistic) <0.001

As shown in Table 4, using annual data for the period 2004-2018, the results suggest an elasticity of 1.42 for the total health sector employment with respect to GDP per capita at constant prices. This

29 [Citation]-Tandon
30 World Health Organisation.

elasticity is interpreted to mean that 1% increase in GDP per capita is associated a corresponding 1.42% increase in total health employment across public and private sectors, holding current health expenditure per capita. The best fitting ones form the variables specifically for doctors, nurses, clinical officers and pharmaceutical workforce have been used for making economic demand projections in chapter 5.

3.2.2. Wages and remuneration of health workers and income relativities

3.2.2.1 Health workforce salaries and income comparisons in the public sector

As summarised in Table 5, on average, the annual income of a health worker is about KES 2,470,446 (US$ 23,088) with a median of 1,387,058 KES (US$12,963)[31]. This, however, varies remarkably from KES 1.2 million among occupational therapist to KES 4.8 million among medical specialist who are unsurprisingly the top earners in the health sector. Professional nurses who are the majority of the health workforce earn, on average, KES1,291,116 (US$12,066) per annum. The income of dentists and general medical practitioners are similar and estimated at KES 3,869,470.40 (US$ 36,163.27.

To explore the internal relativity of the income of health workers, the income of a General Practitioner was used as a reference for comparison. The results (Table 5) revealed a very wide pay relativity gap between health workers. For instance, the least paid health worker (example, Community Oral Health Officer) earns just 23% of the level of income of General Practitioners while others (example, Medical Specialists) earn about 21% more than the General Practitioners in the public sector. On average, other health professionals earn about 60% of the level of income of the General practitioner, but the median is 32%.

When compared with other respected professions outside the health sector but within the public service in Kenya the salaries of health professionals were compared with a lawyer as a proxy (using civil servant job group N as reference), which show that medical officers and medical specialists in the public sector are earn on average 2-two-fold what the lawyers in civil service earn.

Table 5: Estimated Average income and relativities for public sector health workers

No.	List of cadres	Average Annual Salary per worker (in KES) - Before tax	Other Monetary Benefits/ Allowances per worker (in KES) - Per Year	Total Annual Income per worker (KES)	Total Income per worker (USD)	Wage Index (Income as multiples of GDP per capita)	Wage Relativity (GP as Reference)
1	Medical officer	785,854.0	3,204,651.2	3,990,505.12	37,294.44	19.85	1.00
2	Obstetrician & Gynaecologist	1,503,310.4	3,326,160.0	4,829,470.40	45,135.24	24.03	1.21

31 Estimated based on salary scales and allowances for the public health sector from Salaries and Renumeration Commission (SRC)

No.	List of cadres	Average Annual Salary per worker (in KES) - Before tax	Other Monetary Benefits/ Allowances per worker (in KES) - Per Year	Total Annual Income per worker (KES)	Total Income per worker (USD)	Wage Index (Income as multiples of GDP per capita)	Wage Relativity (GP as Reference)
3	Ophthalmologist	1,503,310.4	3,326,160.0	4,829,470.40	45,135.24	24.03	1.21
4	Paediatrician	1,503,310.4	3,326,160.0	4,829,470.40	45,135.24	24.03	1.21
5	Physician (internal Medicine)	1,503,310.4	3,326,160.0	4,829,470.40	45,135.24	24.03	1.21
6	Psychiatrist	1,503,310.4	3,326,160.0	4,829,470.40	45,135.24	24.03	1.21
7	Surgeon	1,503,310.4	3,326,160.0	4,829,470.40	45,135.24	24.03	1.21
8	Pathologist	1,503,310.4	3,326,160.0	4,829,470.40	45,135.24	24.03	1.21
9	Operating Theatre nurse	646,826.6	644,290.0	1,291,116.58	12,066.51	6.42	0.32
10	Kenya Registered Community Health Nurse	646,826.6	644,290.0	1,291,116.58	12,066.51	6.42	0.32
11	Mental Health/ Psychiatry Nurse	646,826.6	644,290.0	1,291,116.58	12,066.51	6.42	0.32
12	Critical care Nurse	646,826.6	644,290.0	1,291,116.58	12,066.51	6.42	0.32
13	Paediatric Nurse	646,826.6	644,290.0	1,291,116.58	12,066.51	6.42	0.32
14	Kenya Registered Midwife	646,826.6	644,290.0	1,291,116.58	12,066.51	6.42	0.32
15	Registered Clinical Officer	610,787.0	820,963.8	1,431,750.82	13,380.85	7.12	0.36
16	Anaesthetist Clinical Officer	780,045.0	1,164,000.0	1,944,045.00	18,168.64	9.67	0.49
17	Lung & Skin Clinical officer	780,045.0	1,164,000.0	1,944,045.00	18,168.64	9.67	0.49
18	Paediatric Clinical Officer	780,045.0	1,164,000.0	1,944,045.00	18,168.64	9.67	0.49
19	Reproductive Health Clinical Officer	780,045.0	1,164,000.0	1,944,045.00	18,168.64	9.67	0.49
20	Dental surgeon	1,503,310.4	2,366,160.0	3,869,470.40	36,163.27	19.25	0.97
21	Community Oral Health Officer	354,842.6	562,000.0	916,842.64	8,568.62	4.56	0.23
22	Pharmacist	1,229,247.9	2,727,000.0	3,956,247.88	36,974.28	19.68	0.99
23	Clinical pharmacist	1,229,247.9	2,727,000.0	3,956,247.88	36,974.28	19.68	0.99
24	Pharmaceutical Technologist	549,145.8	680,200.0	1,229,345.78	11,489.21	6.12	0.31
25	Physiotherapist	546,616.0	795,750.0	1,342,366.00	12,545.48	6.68	0.34
26	Occupational Therapist	486,175.4	720,750.0	1,206,925.38	11,279.68	6.00	0.30
27	Orthopaedic Technologist	517,999.0	754,285.7	1,272,284.69	11,890.51	6.33	0.32

No.	List of cadres	Average Annual Salary per worker (in KES) - Before tax	Other Monetary Benefits/ Allowances per worker (in KES) - Per Year	Total Annual Income per worker (KES)	Total Income per worker (USD)	Wage Index (Income as multiples of GDP per capita)	Wage Relativity (GP as Reference)
28	Clinical Dietician	681,879.9	630,818.2	1,312,698.05	12,268.21	6.53	0.33
29	Nutritionist	681,879.9	630,818.2	1,312,698.05	12,268.21	6.53	0.33
30	Speech Therapist	546,616.0	795,750.0	1,342,366.00	12,545.48	6.68	0.34
31	Medical Laboratory Technologist	624,016.6	689,052.0	1,313,068.60	12,271.67	6.53	0.33
32	Orthopaedic Trauma Technologist	517,999.0	754,285.7	1,272,284.69	11,890.51	6.33	0.32
	Average	**887,185.3**	**1,583,260.8**	**2,470,446.1**	**23,088.3**	**12.3**	**0.6**
	Median	**681,879.9**	**808,356.9**	**1,387,058.4**	**12,963.2**	**6.9**	**0.3**

Source: *calculated from SRC recommended wages and allowances.*

3.2.2.2 Process for Setting and Reviewing of Public Sector Renumeration

For the health workers employed by the public sector, Kenya 2010 Constitution Article 230(4) mandates the Salaries and Remuneration Commission to set and regularly review remuneration and benefits for state officers. The Salaries and Remuneration reviews for the civil service is determined through a Job Evaluation (JE) Exercise conducted by SRC. The SRC set a 4-year review cycle. This review takes into consideration overall affordability within a sustainable fiscal framework.

In its analysis of the affordability and fiscal sustainability of the wage bill for the third remuneration and benefits review cycle, the SRC in its report dated 17th June 2021, noted that the current public sector wage bill consumes a larger percentage of revenue than the target set in the Public Finance Management Act 2012 and a larger percentage of GDP compared to average for developing countries. Due to the effect of COVID-19 on the economy, the implementation of the third salary and review remuneration and benefits was postponed to the FY 2022/2023.

3.2.2.3 Comparison of Private vs Public Sector Health Worker Wages

The analysis considered remuneration for five cadres of health workers in the private and public sector. Generally, the health workers in the public sector have a relatively higher remuneration than their counterparts in the private sector (Table 6). The average annual salary for a medical officer in the public sector is higher than the private sector by 37%, and more than 100% higher income for nurses in the public sector as compared to the private sector. However, there is a significant increase of 49% in remuneration for a nurse in the private sector who becomes a specialist as compared to the public sector where specialist nurses earn just 6% higher than general nurses. Although the specialist nurse's income in the private sector is still 35% lower than a general nurse

in the public sector, the act of promoting or increasing their pay could be an added incentive for nurses in private sector to specialize.

Furthermore, clinical officers in the private sector earn 54% lower than the clinical officers in the public sector while the laboratory technologist in the public sector earn 99% higher than those working in the private sector. Discussion with some managers suggest that the income disparities between public and private have in the recent past played in favour of the public sector whereby health professionals moved from the private sector to the public sector. Nevertheless, fiscal space constraints on one hand and the influence of powerful labour unions affects the public sector PayScale in either direction.

Table 6: Comparison of Public and Private Sector Health Worker Wages

Cadre	Private (KES)	Public (KES)	Ratio of Public to Private
Medical Officers	2,919,996	3,990,505	1.37
Nurses	606,432	1,218,671	2.01
Specialist Nurses	904,284	1,291,117	1.43
Clinical officers	930,000	1,431,751	1.54
Specialist clinical officers	930,000	1,944,045	2.09
Laboratory technologist	660,000	1,313,069	1.99

Note: *Public sector wages taken from salary structure and private sector wages purposely collected and averaged from a sample of well-established private health facilities.*

Source: *Public sector wages are based on Salaries and Renumeration Commission while those of the private sector were based on primary data collection from a sample of private healthcare facilities*

3.2.2.4 Income comparison with other countries

The difference in wages across the countries may determine cross country health worker emigration/immigration[32]. Table 7 presents average monthly income of health workers, comparing Kenya with upper middle-income economies in Africa (South Africa, Botswana, Namibia), lower middle-income economies (Lesotho, Zimbabwe, Kenya, Zambia and Eswatini) and selected low-income economies (Ethiopia, Sierra Leone, Rwanda, Malawi, and Uganda). Overall, the average monthly income of clinical cadres in Kenya fares well against the average of low- and lower-middle income countries in Africa. It, however, fares poorly as compared to the upper-middle-income countries, particularly, Namibia and Botswana which were popular destinations for Kenyan health professionals seeking greener pastures.

32 World Health Organisation.

Table 7: Comparison of wages in Kenya with other countries in Africa

Country	Kenya	Average Monthly Income (USD)- All	Average Monthly Income (USD)- Upper Middle Income
Physician generalists (Medical Officers)	3,108	2,405	3,577
Physician specialists	3,761	3,154	4,158
Nurses	1,006	1,221	1,710
Midwives	1,006	1146	1,581
Dentists	3,108	2,064	3,083
Pharmacists	3,081	1,589	2,171
Laboratory Scientists	1,023	763	1,074
Radiographers	1,139	1,256	1,595
Community Health workers	728	201	254
Physiotherapist	1,045	1,208	1,618
Clinical Officer/Physician Assistant	1,115	518	709
Average	**1,829**	**1,359**	**2,109**

3.2.2.5 Income measured as multiple of GDP per capita – the Wage Index

Another important measure of a worker's income relativity is to compare it to the per capita gross domestic product of the country, which arguably reflects the extent to which aggregate productivity of the country is translated into an individual benefit for their productivity[33]. Wage index was calculated as the estimated annual income divided by current GDP per capita. As shown in Table 4, Kenya's wage index for clinical health professionals in 2021 was averagely 12.3 (but a median of 6.9). This means that the average gross income per health professional was a little more than 12 times the GDP per capita. However, the 2021 wage index for health workers ranged widely from 6.5-folds for clinician dietician to 24-folds for highly specialised medical professionals. Mid-level income earners such as the Kenya Registered Community Health Nurse had a wage index of some 6.4 times the GDP per capita. Internationally, the average wage index is 4.4 for doctors, 3.6 for nurses and 2.1 for other health workers but is 5.1, 4.2 and 2.4, respectively in lower-middle income countries[34]. The relatively higher wage index in Kenya should not be interpreted to portray adequacy or otherwise of the level of remuneration, but rather a suggestion that there is a high level of effort in compensating the health workers.

3.3 Health Expenditure and Health Workforce Financing

This section examines the volume and composition of health expenditure with specific focus on health workforce financing. The aim of the section is to triangulate the available data to gain insights into the current situation while using it as input into fiscal space modelling in a subsequent chapter.

33 Juliana Serje and others, 'Global Health Worker Salary Estimates: An Econometric Analysis of Global Earnings Data', Cost Effectiveness and Resource Allocation, 16.1 (2018), 10.

34 Serje and others.

3.3.1 Recent Health Expenditure Trends in Kenya

The total health expenditure has been growing steadily, increasing from KES 408.76 billion in 2015/16 to KES 497.70 billion in 2018/19 (Table 8). This is equivalent to 5.1% to 5.6% of the national nominal GDP between 2015/16 and 2018/19. Government health expenditure on health as a proportion of total government expenditure has also significantly increased from 8% to 11.7% between 2015/16 and 2018/19.

Table 8: Macroeconomics and health financing trends in Kenya

Indicators	2015/16	2016/17	2017/18	2018/19
Total GDP at current prices (KSh)	7,948,455,314,989	8,033,533,142,872	8,748,155,358,049	8,904,983,900,000
Total government expenditure (KSh)	1,885,877,578,628	2,077,528,559,327	2,168,308,863,754	2,223,927,230,000
Total government expenditure ($)	18,957,354,027	20,277,051,332	21,179,076,080	21,986,384,814
Total Health Expenditure (THE) (KSh)	**408,763,832,549[35]**	**442,094,730,763**	**464,333,260,204**	**497,695,049,827**
Current Health Expenditure (CHE) (KSh)	*385,821,179,459*	*386,813,365,454*	*411,347,786,218*	*447,260,488,885*
Capital Formation (HK) (KSh)	*22,942,653,090*	*55,281,365,309*	*52,985,473,986*	*50,434,560,942*
Total Health Expenditure (THE) ($)	4,109,005,152	4,314,923,859	4,535,400,657	4,920,356,538
THE per capita (KSh)	9,248.1	9,979.6	10,227.6	10,703.1
THE per capita ($)	92.96	97.40	99.90	105.81
CHE per capita (KSh)	8,729.0	8,731.7	9,060.5	9,618.5
CHE per capita ($)	87.7	85.2	88.5	95.1
THE as a % of nominal GDP	5.1%	5.5%	5.3%	5.6%
Government health expenditure as a % of total government expenditure	8.0%	10.8%	10.7%	11.7%

Source: *National Health Accounts 2021, Ministry of Health. Note: The current health expenditure was calculated as total health expenditure less expenditure on fixed capital formation. All expenditures for previous years were adjusted to reflect real expenditure in 2018/19.*

The total health expenditure per capita during the period also rose by 15.7% from KES 9,248 (US$93) in 2015/16 fiscal year to KES 10,703 (US$105.8) during 2018/19 fiscal year. The total health expenditure from Kenya NHA 2021 comprised of current health expenditure of KES 8,729 (US$87.7) and KES 9,618 (US$95) per capita for the 2015/16 and 2018/19 fiscal years respectively.

It is, however, important to note that national government's contribution (per cent) to the overall health expenditure is increasing from 39% in 2017/18 to 48% by 2019/20 with a corresponding decrease in the share of the county governments (see Figure 13). Given that health workforce

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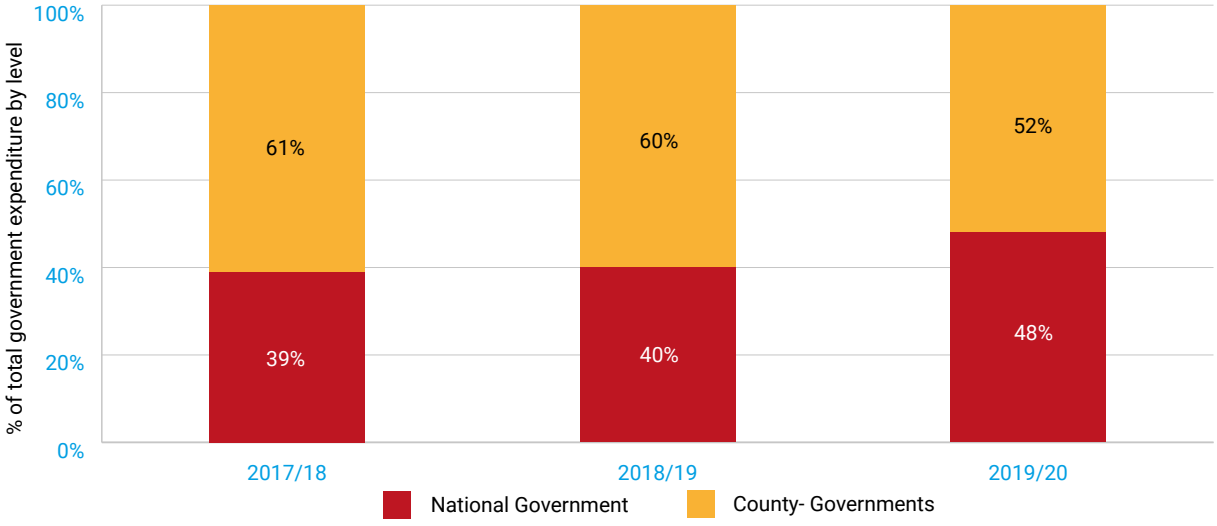
employment and remuneration are largely undertaken by county governments, a decreasing of the health expenditure could signal county-level fiscal constraints with adverse implications for health workforce investments.

Figure 13: Relative contributions of total expenditure by national and county



Source: *MOH Sector Working Group Reports, KHSSP Medium Term Report 2020.*

3.3.2 County Governments' Expenditure Allocated to the Public Sector Wage Bill

The Public Financial Management Act 2012 puts a wage bill (expenditure) ceiling of 35% of county total revenue[36]. Notwithstanding, comparable data from 38 counties show that the allocation to the public sector wage bill from the total county government expenditure is averagely 44% (median = 45%), but this ranges from 29% in Turkana county to 58% in Nakuru county (Table 9). Also, the analysis reveals that the counties are allocating an average of 21% (range: 7-34%) of their total county expenditure to the health workforce.

Table 9: Overall wage bill as proportion County Government expenditure, 2019/2020

No	NAME OF COUNTY	Total County Government Expenditure (KES million)	Total County Wage Bill (KES million)	Total County Gov't Health Expenditure (KES million)	Total County Health Wage Bill (KES million)	Overall County wage Bill as % of Toal Overall County Expenditure	County Health Wage Bill as % of Total County Gov't Expenditure	County Health Wage Bill as % of County Total Health Expenditure
1	Baringo	5,553	3,191	2,323	1,602	57%	29%	69%
2	Bungoma	9,571	4,417	2,869	2,033	46%	21%	71%
3	Busia	6,649	2,767	1,660	1,061	42%	16%	64%
4	Elgeyo/Marakwet	4,428	2,387	1,644	1,239	54%	28%	75%

36 Republic of Kenya (2015). Kenya Public Finance Management Act (no. 18 of 2012): Arrangement Regulation. Kenya Gazette Supplement no. 32. 20th March.

No	NAME OF COUNTY	Total County Government Expenditure (KES million)	Total County Wage Bill (KES million)	Total County Gov't Health Expenditure (KES million)	Total County Health Wage Bill (KES million)	Overall County wage Bill as % of Toal Overall County Expenditure	County Health Wage Bill as % of Total County Gov't Expenditure	County Health Wage Bill as % of County Total Health Expenditure
5	Embu	5,913	3,119	2,383	1,623	53%	27%	68%
6	Garissa	8,991	4,458	2,535	1,898	50%	21%	75%
7	Homa Bay	5,738	3,129	2,492	1,531	55%	27%	61%
8	Isiolo	4,279	1,593	1,338	695	37%	16%	52%
9	Kajiado	7,727	2,891	2,302	1,390	37%	18%	60%
10	Kericho	6,132	2,692	2,700	1,503	44%	25%	56%
11	Kiambu	14,260	6,782	4,981	2,940	48%	21%	59%
12	Kirinyaga	5,164	2,651	2,102	1,465	51%	28%	70%
13	Kisumu	8,379	3,706	2,399	2,133	44%	25%	89%
14	Kitui	9,868	4,098	3,390	1,895	42%	19%	56%
15	Kwale	7,695	2,845	2,460	1,314	37%	17%	53%
16	Laikipia	5,710	2,615	2,263	1,332	46%	23%	59%
17	Lamu	2,902	1,256	880	547	43%	19%	62%
18	Makueni	8,437	3,520	3,102	2,006	42%	24%	65%
19	Marsabit	7,468	2,442	2,006	1,162	33%	16%	58%
20	Meru	9,780	4,631	3,311	2,472	47%	25%	75%
21	Migori	6,367	2,918	1,432	1,188	46%	19%	83%
22	Mombasa	12,529	5,187	2,534	2,161	41%	17%	85%
23	Nakuru	10,137	5,918	4,231	3,445	58%	34%	81%
24	Nandi	6,727	3,016	2,371	1,298	45%	19%	55%
25	Narok	9,960	3,629	1,992	1,198	36%	12%	60%
26	Nyamira	5,602	3,137	1,658	1,441	56%	26%	87%
27	Nyeri	7,045	3,172	2,759	2,018	45%	29%	73%
28	Samburu	4,183	1,982	935	604	47%	14%	65%
29	Siaya	5,702	2,747	1,904	1,272	48%	22%	67%
30	Taita-Taveta	5,067	2,245	1,291	1,048	44%	21%	81%
31	Tana River	4,792	1,631	952	485	34%	10%	51%
32	Tharaka -Nithi	4,603	2,061	1,718	1,308	45%	28%	76%
33	Trans Nzoia	6,388	2,254	1,956	437	35%	7%	22%
34	Turkana	10,349	3,019	1,982	865	29%	8%	44%
35	Uasin Gishu	6,745	3,282	1,989	1,645	49%	24%	83%
36	Vihiga	5,699	2,438	1,406	979	43%	17%	70%
37	Wajir	10,381	3,861	2,172	1,127	37%	11%	52%
38	West Pokot	5,519	2,336	1,492	1,011	42%	18%	68%
	Average	**7,169**	**3,158**	**2,208**	**1,457**	**44%**	**21%**	**66%**
	Median	**6,518**	**2,967**	**2,137**	**1,323**	**45%**	**21%**	**66%**
	Minimum	**2,902**	**1,256**	**880**	**437**	**29%**	**7%**	**22%**
	Maximum	**14,260**	**6,782**	**4,981**	**3,445**	**58%**	**34%**	**89%**

Source: *Analysed with data from Controller of Budget Implementation Review Report, 2019/20*

3.3.3 Health Expenditure Allocated to the Wage Bill Across National and County Governments

In the health sector, total national and county governments wage bill as a proportion of current health sector expenditure was estimated to be 67.2% in the 2016/17 fiscal year but declined to 44.2% in 2017/18 before a slight increase to 48.3% in the 2018/19 financial year. Analysis of the data from the county governments, however, show a sustained increase from 51.5% in 2016/17 through 58.7% in 2017/18 to 68.2% in 2018/19. In 2019/20, counties spent about 66% of their health expenditure on the wage bill. This was, however, very variables from as low as 22% in Trans Nzoia county to as much as 89% in the Kisumu county.

Table 10: Government health expenditure by investment areas

Investment area	2017/18	2018/19	2019/20
Service delivery	16.1%	16.6%	17.7%
Human resources for health	49.4%	48.0%	43.7%
Health products and technologies	6.6%	6.4%	5.9%
Infrastructure and equipment	13.7%	13.5%	9.0%
Leadership and governance	10.5%	10.7%	19.4%
Information, monitoring and evaluation	0.0%	0.0%	0.10%
Health Financing	0.1%	0.4%	0.3%
Health Research and development	3.6%	4.4%	3.9%
Total	**100.0%**	**100.0%**	**100.0%**

Source: *Ministry of Health Sector Working Group Reports, KHSSP Medium Term Report 2020.*

At the national level, as indicated in Table 10, human resources dominated government expenditure, but its share is on a decreasing trajectory, suggesting a deceleration of investments in the health workforce. For instance, the health workforce' share of the public sector health investment decreased by 5.7% from 49.4% in 2017/18 to 43.7% in 2019/20. In contrast, within the same period, expenditure on leadership and governance have overtaken service delivery and infrastructure and equipment to become the second top priority area of expenditure. For instance, while the percentage share of health investments for health workforce, health products and technologies, infrastructure and equipment decreased, that of leadership and governance almost doubled from 10.5% in 2017/18 to 19.4% in 2019/20.

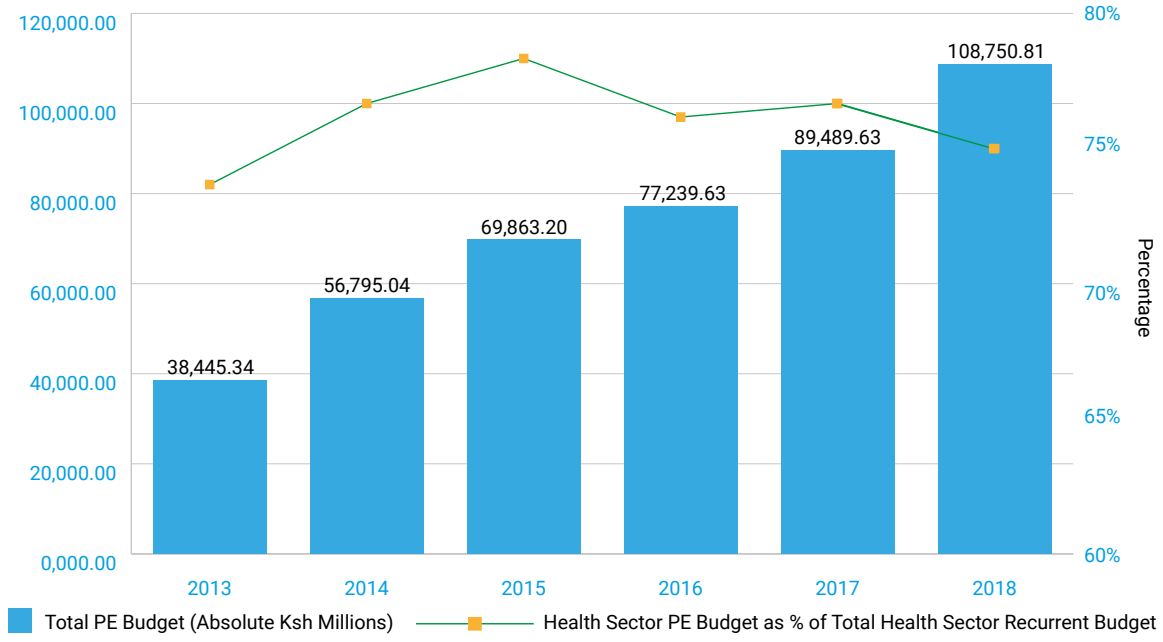
3.3.4 Kenya's Wage bill compared with the global average

In the context of Kenya, available data show that Kenya's total health budget has more than doubled (about 220%) since the 2012/2013 financial year, increasing from 94 billion Shillings (in 2012/2013) to 207[37] billion Shillings in 2018/19 financial year (MoH 2019). On the other hand, growth in the public health sector wage bill has outpaced growth in the total health budget since the 2012/2013

37 This is budget allocation for both national (Kes 93 billion) and County (Kes 117 billion) in FY 2018/19

financial year. The wage bill increased by nearly three-fold since 2012 from 37 billion Shillings to 101 billion Shillings in 2018. This has been against the backdrop of 46% increase in the stock of health workers from 46,259 in 2014 to 67,740 in 2018, and an upward adjustment in the wage rates negotiated through the collective bargaining agreements (CBA) between the government and health workers unions. Consequently, the public health sector wage bill accounts for 72% - 79% of the recurrent health expenditure even though it represents only 47% of the total health sector budget (see Figure 14). Globally the average wage bill, expressed as a proportion of public spending on health is about 57% which is much higher (65% -80%) in low and middle-income countries[38]. Thus, 47% of the total health budget is spent on the wage bill in Kenya is slightly (about 10%) lower than the global average.

Figure 14: Public Health Sector Wage Bill in Kenya



Source: *National and County Budget Analysis*

Note: *MOH included in PE budget.*

38 J. Lauer, A. Soucat, E. Araújo, and others, 'Paying for Needed Health Workers for the SDGs: An Analysis of Fiscal and Financial Space', In Health Employment and Economic Growth: An Evidence Base. Geneva: World Health Organisation, 236 (2017).

Section 4

4. DESCRIPTIVE LABOUR MARKET SITUATION

4.1 Current Stock and Trends of Health Workers in Kenya

4.1.1 Current Stock and density of health workers

Kenya is estimated to have about 189,932 active health workers across 13 major health occupations in 2021 (Table 11). This translates into a density of 30.14 doctors, nurses, midwives and clinical officers per 10,000 population in 2021, which represents about 68% of the indicative SDG index threshold, which is considered necessary to make good progress on the SDG 3 targets[39]. However, when all occupational groups are taken into account, there are 38.71 health professionals and associates per 10,000 Kenyans or one health worker per 250 persons. This must, however, be interpreted with caution as not all the health workers undertake activities that directly and immediately addresses the basic health needs of the population.

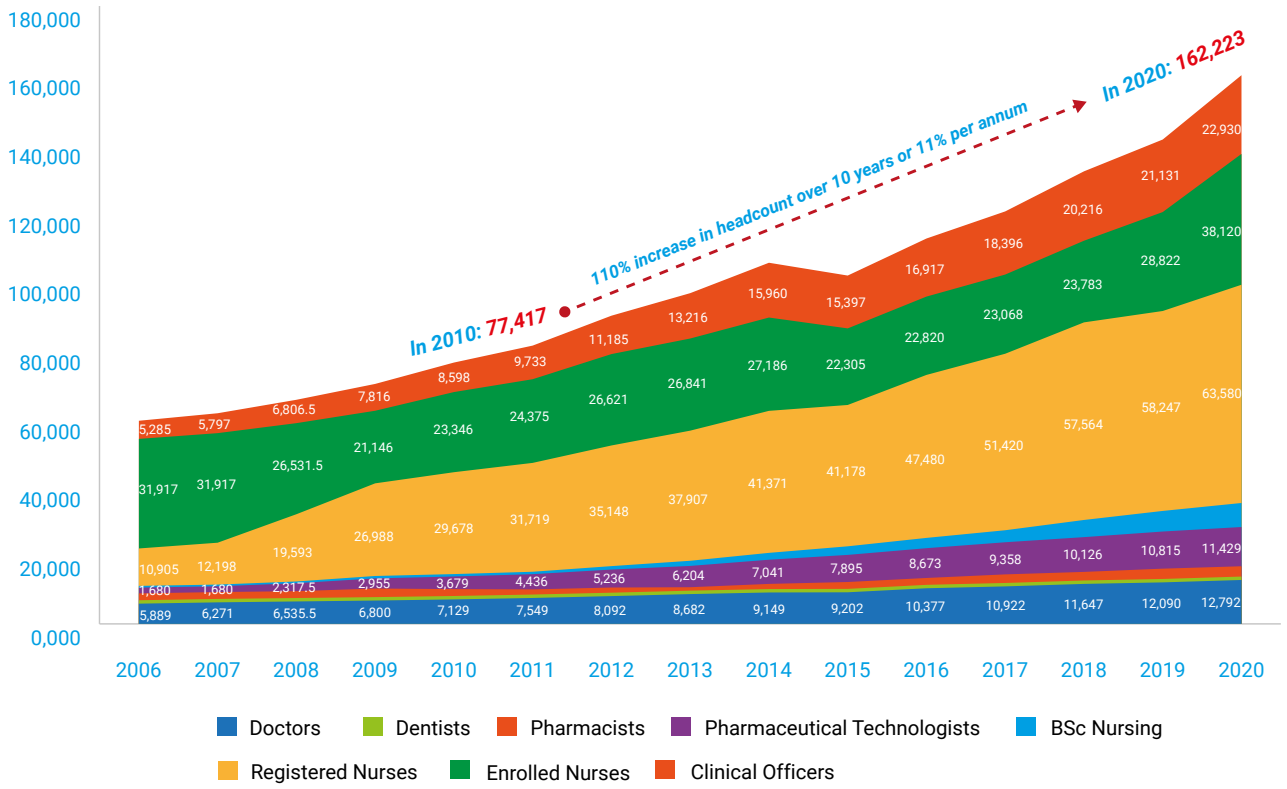
Out of the active stock, 143,227 (75.41%) were in employment (either public or private sectors) – an estimated 27,243 health professionals (14.34%) were either unemployed or underemployed. About 10% of the registered health professionals were out-of-labour-force (OLF), leaving a health labour participation rate of 90%.

Available data show that doctors, nurses/midwives, clinical officers, pharmacists and pharmacy technologists, the overall stock increased rapidly from 77,417 in 2010 to 162,233 in 2020, which translates into 106% increase in within a decade or approximately 11% increase per annum (Figure 15). The highest growth within the last decade was recorded among bachelor's degree prepared registered nurses, increasing by 706% from 988 in 2010 to 7,959 in 2020. Also, diploma prepared registered nurses increased by114.23% from 29,678 in 2010 to 63,580 in 2020. It is worth noting that recent reports estimated a stock of nearly 60,000 nurses and midwives[40], but this analysis has found that to be a gross underestimate, reflecting only the public sector as the stock is at least 109,659 when the private sector and unemployed ones are taken into account.

39 WHO, 'Global Strategy on Human Resources for Health'.

40 WHO/AFRO, 'The State of the Health Workforce in the WHO African Region, 2021', World Health Organization (WHO) Regional Office for Africa (AFRO), 2021 <https://apps.who.int/iris/bitstream/handle/10665/348855/9789290234555-eng.pdf?sequence=1>.

Figure 15: Trends in the Overall Stock of Selected Health Professionals, 2006–2020



Source: *KNBS and Regulatory Bodies*

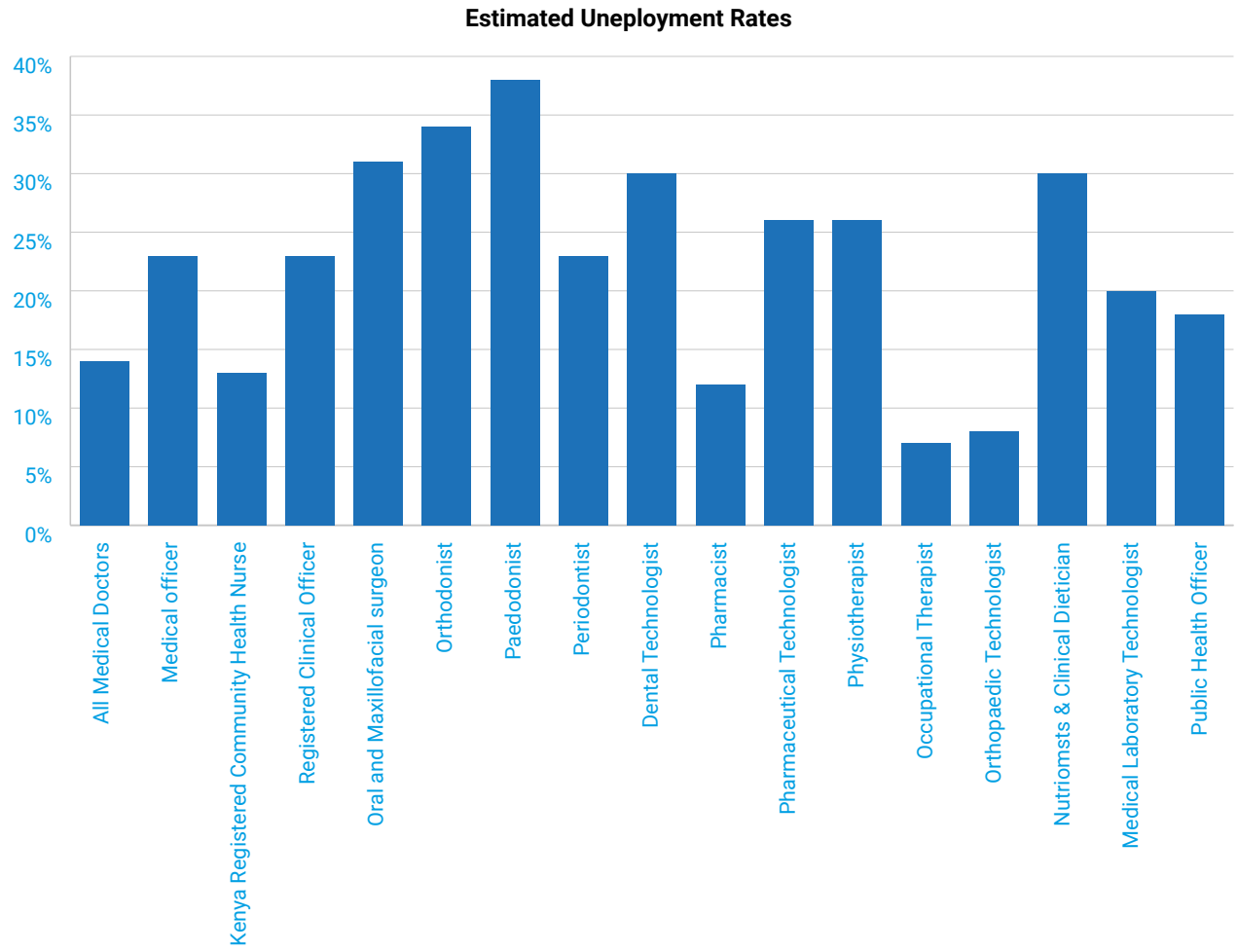
4.1.2 Unemployment of Health Workers

Preliminary discussions with health system managers and stakeholders suggest a rising phenomenon of trained but unemployed health workers in Kenya, which is a sign of apparent demand-based surplus or limited economic capacity to employ all the available stock of health workers who are willing to be employed at the prevailing wages[41]. As shown in Table 10, consecutive estimates using available limited data suggests that at least 27,243 health workers were unemployed in 2021 (Figure 16 and Table 11). A large number of the unemployed health workers (n = 9,309) were nurses and midwives which represents 8% of the overall stock of nurses and midwives in the country. Among cadres with large number of baseline stock, the highest rate of unemployment was among nutritionists and dieticians with 30% (n = 3,051), clinical officers with 26% (n = 6,683) clinical officers being unemployed. Also, an estimated 1,831 medical officers (generalist doctors) may have been unemployed or underemployed in 2021, which represents 23% of the overall stock of doctors in the country. Worryingly, the overall unemployment rate among the health workforce was as high as 14% compared to the ILO's estimate of 2.98% national rate of

41 World Health Organisation.

unemployment in 2020[42]. It also worth noting that the present estimates are not comprehensive owing to data limitation, hence, the true scale of health worker unemployment could be higher. A further exploration of the levels of unemployment or underemployment among health workers will be worthwhile initiative.

Figure 16: Estimated Unemployment Rate Among Selected Health Professionals, 2020



42 World Bank, 'Unemployment, Total (% of Total Labor Force) (Modeled ILO Estimate) - Kenya | Data', 2021 <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=KE> [accessed 22 January 2022].

Table 11: Current stock and density of health professionals

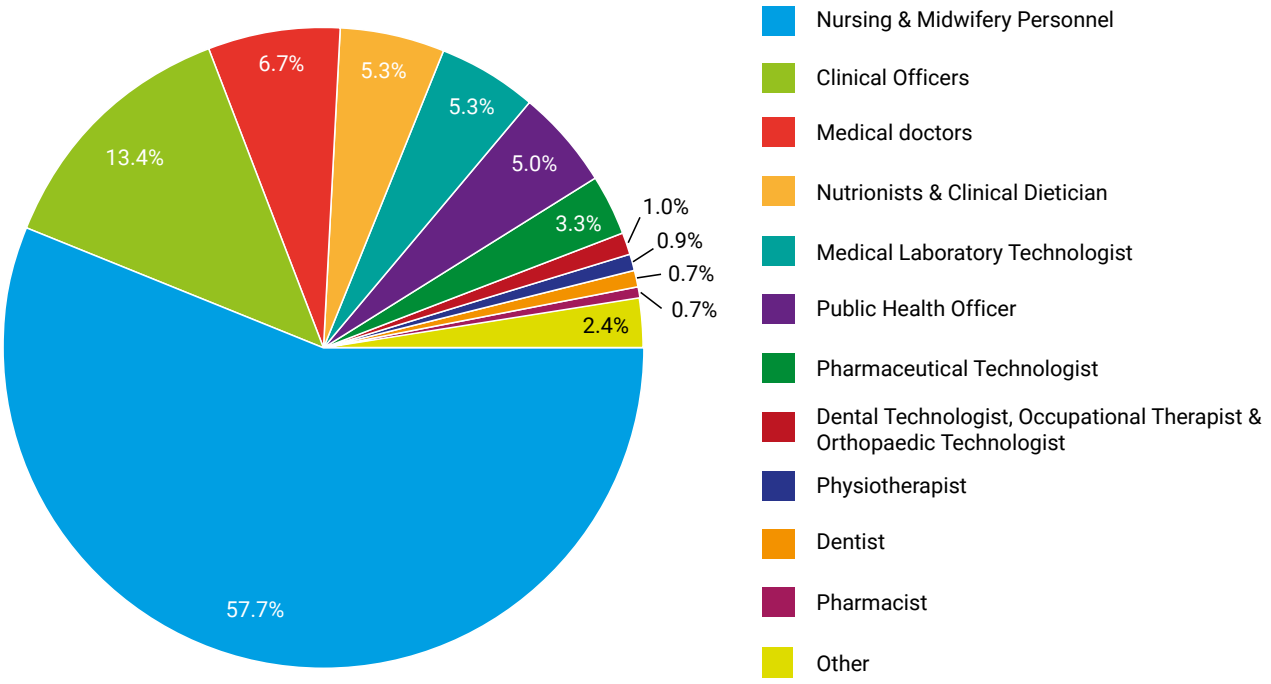
SN	ISCO Classification	Occupation Title in Kenya	Stock of qualified (Registered) health workers, (P)	Number Employed in Public Sector (EnPb)	Employed in Private Sectors (EnPr)	Number Unemployed (U)	Labour Participation Rate [(EnPb+EnPr +U)/P]	Density per 10,000 population
1	**221 - Medical doctors**	**Doctors**	**12,792**	**3,655**	**4,462**	**1,831**	**78%**	**2.607**
2	2211 - Generalist medical practitioners	Medical officer	7,884	2,882	3,171	1,831	100%	1.607
3	2212 - Specialist medical practitioners	Dermatologist	28	10	18		100%	0.006
4	2212 - Specialist medical practitioners	Obstetrician &Gynaecologist	402	196	206		100%	0.082
5	2212 - Specialist medical practitioners	Ophthalmologist	104	37	67		100%	0.021
6	2212 - Specialist medical practitioners	Paediatrician	343	124	219		100%	0.070
7	2212 - Specialist medical practitioners	Physician(internal Medicine)	347	89	258		100%	0.071
8	2212 - Specialist medical practitioners	Psychiatrist	70	35	35		100%	0.014
9	2212 - Specialist medical practitioners	Radiologist	140	57	83		100%	0.029
10	2212 - Specialist medical practitioners	Surgeon	332	123	209		100%	0.068
11	2212 - Specialist medical practitioners	Pathologist	65	25	40		100%	0.013
12	2212 - Specialist medical practitioners	Anaesthesiologist	158	41	117		100%	0.032
13	2212 - Specialist medical practitioners	ENT Surgeon	75	36	39		100%	0.015
14	**222 - Nursing & Midwifery Personnel**	**Kenya Registered Community Health Nurse**	**109,659**	**68,950**	**16,126**	**9,309**	**86%**	**22.351**
15	2221 & 2222- Nursing and Midwifery professionals	Kenya Registered Community Health Nurse	71,539	30,830	16,126	9,309	79%	14.581
16	3221 - Nursing associate professionals	Kenya Enrolled community Health Nurse	38,120	38,120			100%	7.770
17	**2269 - Health professionals not elsewhere classified**	**Registered Clinical Officer**	**25,400**	**7,141**	**11,576**	**6,683**	**100%**	**5.177**
18	2269 - Health professionals not elsewhere classified	ENT Clinical officer	160	94	66		100%	0.033

SN	ISCO Classification	Occupation Title in Kenya	Stock of qualified (Registered) health workers, (P)	Number Employed in Public Sector (EnPb)	Employed in Private Sectors (EnPr)	Number Unemployed (U)	Labour Participation Rate [(EnPb+EnPr +U)/P]	Density per 10,000 population
19	2269 - Health professionals not elsewhere classified	Anaesthetists Clinical Officer	932	434	498		100%	0.190
20	2269 - Health professionals not elsewhere classified	Lung & Skin Clinical officer	272	162	110		100%	0.055
21	2269 - Health professionals not elsewhere classified	Ophthalmology Clinical Officer	202	133	69		100%	0.041
22	2269 - Health professionals not elsewhere classified	Paediatric Clinical Officer	512	139	373		100%	0.104
23	2269 - Health professionals not elsewhere classified	Reproductive Health Clinical Officer	132	66	66		100%	0.027
24	**2261 - Dentists**	**Dentist**	**1,344**				**0%**	**0.274**
25	2261 - Dentists	Endodontist	1	0	1	0	100%	0.000
26	2261 - Dentists	Oral and Maxillofacial surgeon	29	5	15	9	100%	0.006
27	2261 - Dentists	Orthodontist	9		6	3	100%	0.002
28	2261 - Dentists	Paedodonist	21		13	8	100%	0.004
29	2261 - Dentists	Prosthodontist	2	2	0	0	100%	0.000
30	2261 - Dentists	Periodontist	9	3	4	2	100%	0.002
31	3251 - Dental assistants and therapists	Dental Technologist	987	177	514	296	100%	0.201
32	2262 - Pharmacists	Pharmacist	1,337	898	278	161	100%	0.273
33	3213 - Pharmaceutical technicians and assistants	Pharmaceutical Technologist	6,240	1,762	2,839	1,639	100%	1.272
34	2264 - Physiotherapists	Physiotherapist	1,757	478	811	468	100%	0.358
35	2263 - Environmental and occupational health and hygiene professionals	Occupational Therapist	553	440	72	41	100%	0.113
36	3214 - Medical and dental prosthetic technicians	Orthopaedic Technologist	287	221	42	24	100%	0.058
37	2265 - Dieticians and nutritionists	Nutrionists & Clinical Dietician	10,071	1,736	5,284	3,051	100%	2.053
38	3212 - Medical and pathology laboratory technicians	Medical Laboratory Technologist	10,000	4,472	3,505	2,023	100%	2.038
39	2263 - Environmental and occupational health and hygiene professionals	Public Health Officer	9,505	4,814	2,974	1,717	100%	1.937
	Total		**189,932**	**94,744**	**48,483**	**27,243**	**90%**	**38.712**

4.1.3 Distribution a health workforce by category

More than half of the overall stock of 189,132 health workers were nurses and midwives (57.7%), a finding which is consistent with the Africa region's average[43] and global estimates[44]. Nurses/ midwives were distantly followed by clinical officers with 13.4% of the total health workforce in Kenya, medical doctors (inclusive of specialists and generalists) constituted 6.7% of the workforce stock. Figure 17 provides details of the occupational distribution of the stock of health workers in Kenya.

Figure 17: Composition of the Health Professionals, 2021



4.1.4 Trends in the density of Health Workforce in Kenya, 2006–2020

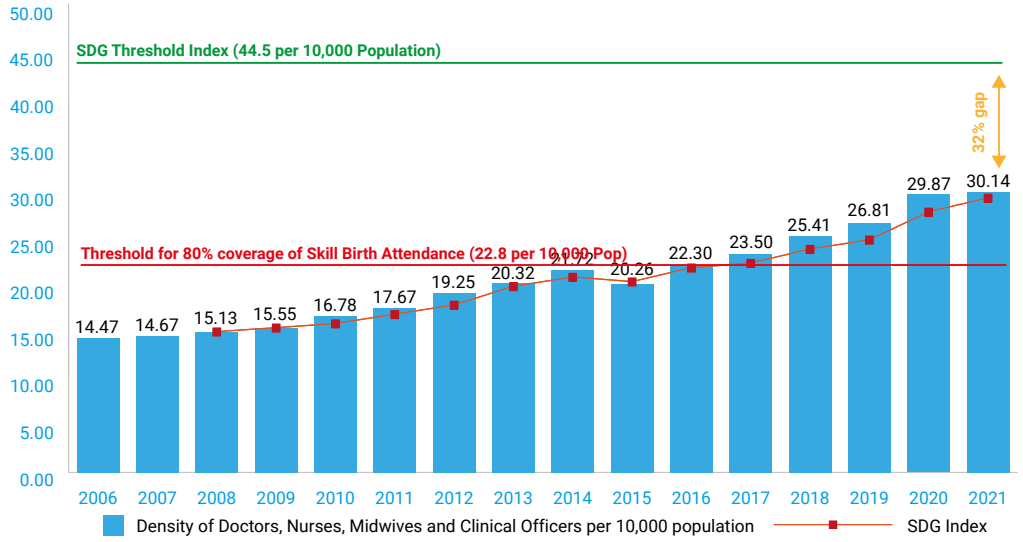
The density of 30.14 doctors, nurses, midwives and clinical officers per 10,000 population is more than doubled since the last 16 years, between 2006 and 2021 (an increase of 108% between 2006 and 2021). The annual average rate of growth in the density is about 6.75% except in 2015 when there was decline of 6.5% (influenced by 18% decline in the stock of enrolled nurses and 3.5% decline in the stock of clinical officers). In comparison with international HWF thresholds. By 2015, Kenya also met the lower limit of the threshold that corresponds to 80% coverage of skilled birth attendance – a key target during the MDG era. In the context of the SDGs, Kenya in 2021 had 68% of

43 WHO/AFRO, The State of the Health Workforce in the WHO African Region, (Brazzaville, Republic of Congo: World Health Organisation, Regional Office for Africa, 2021).
44 WHO, 'State of the World's Nursing 2020: Investing in Education, Jobs and Leadership', 2020.

the 44.5 doctors, nurses and midwives per 10,000 population SDG threshold indicator, only falling short of the 2030 target by 32%. However, at the prevailing rate of increase, this benchmark could be attained earlier than 2030 (see Figure 18).

Notwithstanding, the Global Strategy on human resources for health: workforce 2030[45] called on countries to match '. . .the supply of health workers to population needs, now and in the future' by adopting need-based approaches for planning health workforce investments.

Figure 18: Trend in density of doctors, nurses, midwives and clinical officers, 2006–2021



4.1.5 Health workforce distribution by sector of employment

As depicted in Table 12, about 66% of the selected health professionals are employed in the public sector compared with 34% employed in the private sector. The private sector, however, is the main employer of the medical doctors (55%) in comparison to the public sector's 45%. Moreover, roughly 62% of medical specialists are employed in the private sector. Macroeconomic data also suggest that when all health workers (of all cadres) are considered, the private sector becomes the main driver of health employment in Kenya.

In contrast, 81% of nurses and midwives who form the majority of the skilled health workforce are in the public sector with the private sector absorbing only 19% of the nursing and midwifery workforce. Similarly, 62% of clinical officers are employed within the public sector compared with 38% in the public sector, but 73% of paediatric clinical officers are employed in the private sector. While only 24% of pharmacists are in the private sector, the private sector employs 62% of pharmacy technologists. Similarly, about 63% of physiotherapists are into the private sector while 37% are in the public sector.

45 WHO, 'Global Strategy on Human Resources for Health'.

Table 12: Health workforce distribution by sector of employment

SN	ISCO Classification	Occupation Title in Kenya	Stock of qualified (Registered) health workers, (P)	% Public Sector Share	% Public Sector Share	Occupation Group as % share of overall stock
1	**221 - Medical doctors**	**Doctors**	**12,792**	**45%**	**55%**	**6.7%**
2	2211 - Generalist medical practitioners	Medical officer	7,884	48%	52%	4.2%
3	2212 - Specialist medical practitioners	Dermatologist	28	36%	64%	0.0%
4	2212 - Specialist medical practitioners	Obstetrician &Gynaecologist	402	49%	51%	0.2%
5	2212 - Specialist medical practitioners	Ophthalmologist	104	36%	64%	0.1%
6	2212 - Specialist medical practitioners	Paediatrician	343	36%	64%	0.2%
7	2212 - Specialist medical practitioners	Physician (internal Medicine)	347	26%	74%	0.2%
8	2212 - Specialist medical practitioners	Psychiatrist	70	50%	50%	0.0%
9	2212 - Specialist medical practitioners	Radiologist	140	41%	59%	0.1%
10	2212 - Specialist medical practitioners	Surgeon	332	37%	63%	0.2%
11	2212 - Specialist medical practitioners	Pathologist	65	38%	62%	0.0%
12	2212 - Specialist medical practitioners	Anesthesiologist	158	26%	74%	0.1%
13	2212 - Specialist medical practitioners	ENT Surgeon	75	48%	52%	0.0%
14	**222 - Nursing & Midwifery Personnel**	**Kenya Registered Community Health Nurse**	**109,659**	**81%**	**19%**	**57.7%**
15	2221 & 2222- Nursing and Midwifery professionals	Kenya Registered Community Health Nurse	71,539	66%	34%	37.7%
16	*3221 - Nursing associate professionals*	*Kenya Enrolled community Health Nurse*	38,120	100%	0%	20.1%
17	**2269 - Health professionals not elsewhere classified**	**Registered Clinical Officer**	**25,400**	**38%**	**62%**	**13.4%**
18	2269 - Health professionals not elsewhere classified	ENT Clinical officer	160	59%	41%	0.1%
19	2269 - Health professionals not elsewhere classified	Anaesthetist Clinical Officer	932	47%	53%	0.5%
20	2269 - Health professionals not elsewhere classified	Lung & Skin Clinical officer	272	60%	40%	0.1%
21	2269 - Health professionals not elsewhere classified	Ophthalmology Clinical Officer	202	66%	34%	0.1%
22	2269 - Health professionals not elsewhere classified	Paediatric Clinical Officer	512	27%	73%	0.3%

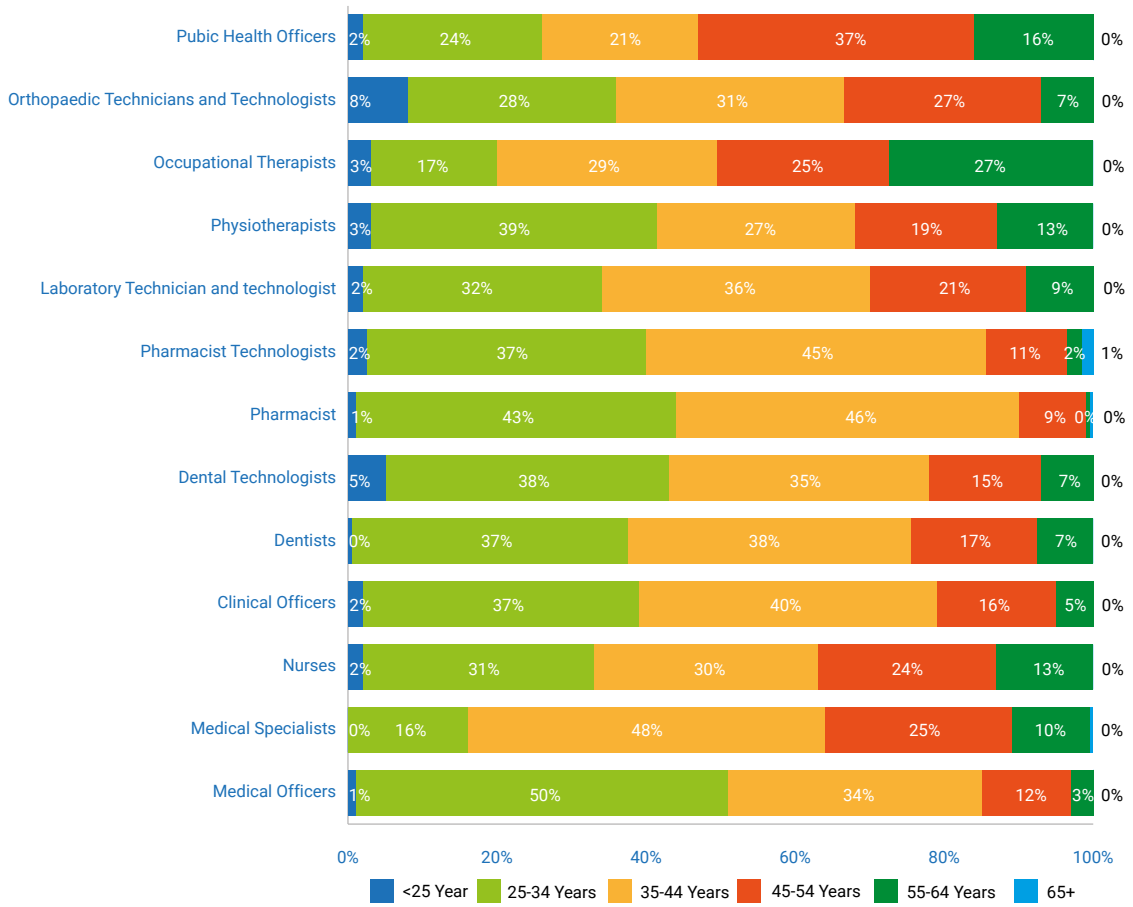
SN	ISCO Classification	Occupation Title in Kenya	Stock of qualified (Registered) health workers, (P)	% Public Sector Share	% Public Sector Share	Occupation Group as % share of overall stock
23	2269 - Health professionals not elsewhere classified	Reproductive Health Clinical Officer	132	50%	50%	0.1%
24	**2261 – Dentists**	**Dentist**	**1,344**			**0.7%**
25	2261 – Dentists	Endodontist	1	0%	100%	0.0%
26	2261 – Dentists	Oral and Maxillofacial surgeon	29	25%	75%	0.0%
27	2261 – Dentists	Orthodonist	9	0%	100%	0.0%
28	2261 – Dentists	Paedodonist	21	0%	100%	0.0%
29	2261 – Dentists	Prosthodontist	2	100%	0%	0.0%
30	2261 – Dentists	Periodontist	9	43%	57%	0.0%
31	3251 - Dental assistants and therapists	Dental Technologist	987	26%	74%	0.5%
32	2262 – Pharmacists	Pharmacist	1,337	76%	24%	0.7%
33	3213 - Pharmaceutical technicians and assistants	Pharmaceutical Technologist	6,240	38%	62%	3.3%
34	2264 – Physiotherapists	Physiotherapist	1,757	37%	63%	0.9%
35	2263 - Environmental and occupational health and hygiene professionals	Occupational Therapist	553	86%	14%	0.3%
36	3214 - Medical and dental prosthetic technicians	Orthopaedic Technologist	287	84%	16%	0.2%
37	2265 - Dieticians and nutritionists	Nutrionists & Clinical Dietician	10,071	25%	75%	5.3%
38	3212 - Medical and pathology laboratory technicians	Medical Laboratory Technologist	10,000	56%	44%	5.3%
39	2263 - Environmental and occupational health and hygiene professionals	Public Health Officer	9,505	62%	38%	5.0%
	Total		**189,932**	**66%**	**34%**	

4.2 Characteristics of the current stock of the health workforce

4.2.1 Age distribution of health workers

Overall, 67.5% of the health professionals in the public sector are aged 25 – 44 years (Figure 19). Only 10% of these health professionals are 54 years or older, which is higher among some medical specialists - ENT Specialists (22.22%), surgeons (11.8%), and obstetrician & gynaecologist (11.73%). In particular, a little over 63% of nurses are younger than 45 years, and 70% of them are female (Figure 6). Furthermore, a high proportion of medical officers (50%) are young professionals between ages 25 and 34. Majority of medical specialists (62%) are males mostly (48%) within the ages of 35 to 44 years old. Also, most pharmacists (46%) and pharmacy technologists (45%) are between the age of 35 to 44 years, while majority of public health officers (37%) are of a higher age bracket (45 – 54 years). Pharmaceutical technologists (1%) have the highest proportion of health workers aged 65 and above.

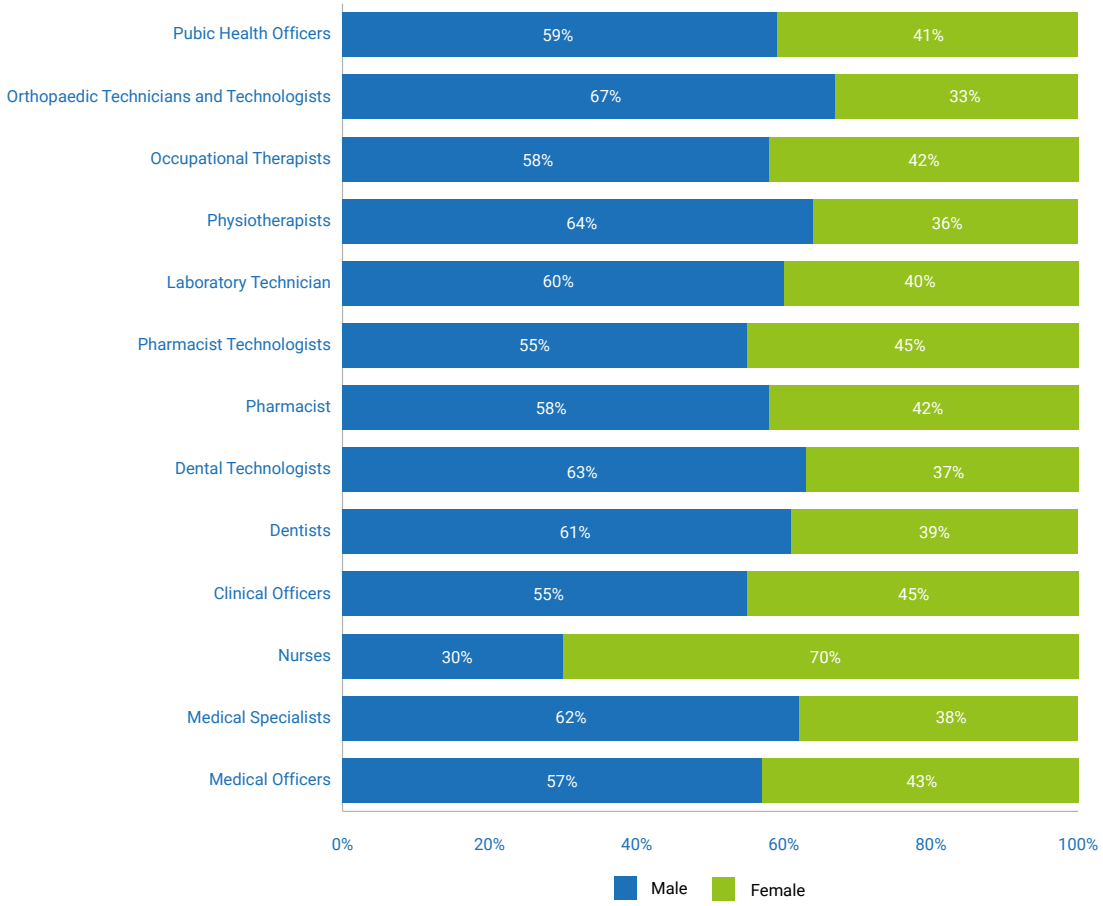
Figure 19: Age distribution of Health Workers



4.2.2 Gender distribution of health workers

As shown in Figure 19, the gender distribution of health workers in Kenya, presented in figure 7, shows that overall, 58% of the health professionals considered in this analysis are female. However, apart from nurses (70%) that have more females, most health professionals are dominated by males. Of note, there is a high proportion of orthopaedic technicians and technologists (67%), physiotherapists (64%), dentists (61%) and medical specialists (62%) are males. Other cadres that have more males than females are pharmacy technologists (55%), public health officers (59%), occupational therapists (58%), laboratory technicians and technologists (60%), pharmacists (58%) and clinical officers (55%).

Figure 20: Gender composition of the health workforce



4.3 Geographic distribution of health workers: Equity implications

There are several approaches to analysing equity in in health work force distribution. It has been documented that the conclusion about equity is often very sensitive to the normative distributional

criteria upon which the focal variable is shared among geographical units or defined population demographics[46]. In this report, a simple measure of health workforce distributional equity which has been used in several African countries[47] (HRH Geographical Equity Index), was adopted to explore the equity implications of the county distribution of the existing health workforce (see methods section for details of the approach).

Without adjusting for the counties share of the national population, Nairobi (6.2%), Kiambu (4%) and Nakuru (3.8%) counties have the highest share of the country's public sector health professionals while Tana River, Isiolo, and Samburu counties have the lowest share at less than 1% each. General medical practitioners in the public sector are mostly found in Nairobi (8.5%), Kiambu (7.3%) and Machakos (5.2%) counties. Tana River, Kajiado, Samburu, Vihiga, Nyandarua, Bomet, and Tharaka Nithi counties have the lowest share of the country's stock of general medical practitioners at less than 1% each. The highest proportion of the public sector's nursing and midwifery professionals are found in Nairobi (6.4%), Nakuru (4.1%) and Kiambu (4%) counties while Tana River, Isiolo and Vihiga counties have the lowest share of these professionals at less than 1% each.

Similarly, medical and pathological laboratory technicians in the public sector are mostly found in Nairobi (5.9%), Muranga (4.3%), and Bungoma (3.5%) counties whereas they are least found in Kajiado, Samburu, Isiolo and Bomet counties at less than 1% each. Nairobi (5.9%), Migori (4.1%), and Kisii (3.4%) counties have the highest proportion of the country's paramedical practitioners/ clinical officers while Isiolo, Nyandarua, Samburu, Wajir and Lamu counties have the least at less than 1% each. The country's public sector pharmacists are mainly found in Nairobi (4.7%), Kiambu (4.6%), and Meru (4.6%) counties whereas they are least found in Samburu, Nyandarua, Isiolo, Vihiga, Garissa and Wajir counties which have less than 1% of the country's pharmacists each. Environmental health workers in Kenya's public sector are mostly found in Nairobi (5%), Nandi (4.8%) and Kilifi (4.7%) counties. Kajiado, Nyamira, Siaya, Lamu, Trans Nzoia, Samburu and Tana River counties have the lowest share of the country's public sector environmental health workers.

However, when the share of county health workforce is adjusted with the county's share of the population, across six occupational groups, the overall distribution is skewed by 7.31 folds such that some counties are more than seven times better off than others. For example, Lamu (GEI = 4.3) and Taita Taveta (GEI = 2.7) counties are respectively 4.3-folds and 2.7-folds relatively better off in the aggregate distribution of health professionals in the public sector as compared to Kajiado, Narok and Trans Nzoia with the lowest GEI of 0.6 each. About 40% (n = 19) of counties do not have an equitable share of the health workforce when compared with their share of the population.

46 Anthony J. Culyer, 'Equality and Equity', in Encyclopedia of Global Bioethics, ed. by Henk ten Have (Springer International Publishing, 2015), pp. 1–11 <https://doi.org/10.1007/978-3-319-05544-2_176-1>; Michael A Munga and Ottar Mæstad, 'Measuring Inequalities in the Distribution of Health Workers: The Case of Tanzania', Human Resources for Health, 7.1 (2009) <https://doi.org/10.1186/1478-4491-7-4>; James Avoka Asamani and others, 'The Cost of Health Workforce Gaps and Inequitable Distribution in the Ghana Health Service: An Analysis towards Evidence-Based Health Workforce Planning and Management.', Human Resources for Health, 2020 <https://doi.org/10.21203/rs.3.rs-21946/v3>.

47 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'.

The most inequitably distributed occupational group is laboratory technologist with nearly 52-fold disparities, doctors with 18-fold disparity, and pharmacists with 17-fold disparities while clinical officers and nurses have the lowest level of distributional disparities with 6-fold and 9-fold respectively (Table 13).

The GEI for general medical practitioners is 18.44, which imply that some counties are more than 18 times better off than others in terms of their proportional share of the countries doctors relative to their share of the population. In particular, the distribution of general medical practitioners in the public sector is better off in Lamu (GEI = 4.3) and Nyeri (GEI = 2.4) counties where they have 4.3 and 2.4 times their share of the national population. However, the lowest ratios were Kajiado (GEI = 0.3) and Nakuru (GEI = 0.4) counties where their share of the general medical practitioners are equivalent to only 30% and 40% of their respective share of the national population. The equity ratio for the distribution of the public sector's nursing and midwifery professionals, medical and pathological laboratory technicians, and pharmacists in the country is highest in Lamu and Taita Taveta counties. Trans Nzoia and Narok counties have the lowest equity ratio for the distribution of nursing and midwifery professionals at less than 0.6 each. Taita Taveta and Lamu counties have the highest equity ratio for the distribution of paramedical clinical officers at 3.5 and 3.4 respectively while it is lowest in Nyandaura, Samburu and Kilifi at less than 0.5 each. Nandi, Elgeyo Marakwet and Baringo counties have the highest equity ratio, at about 2.5 each, for the distribution of environmental health workers in the public sector while it is lowest for Kajiado, Nyamira and Siaya counties at less than 0.3 each. Figure 21 provides a heatmap of the nature of distribution of health workforce taking into account the counties share of the population.

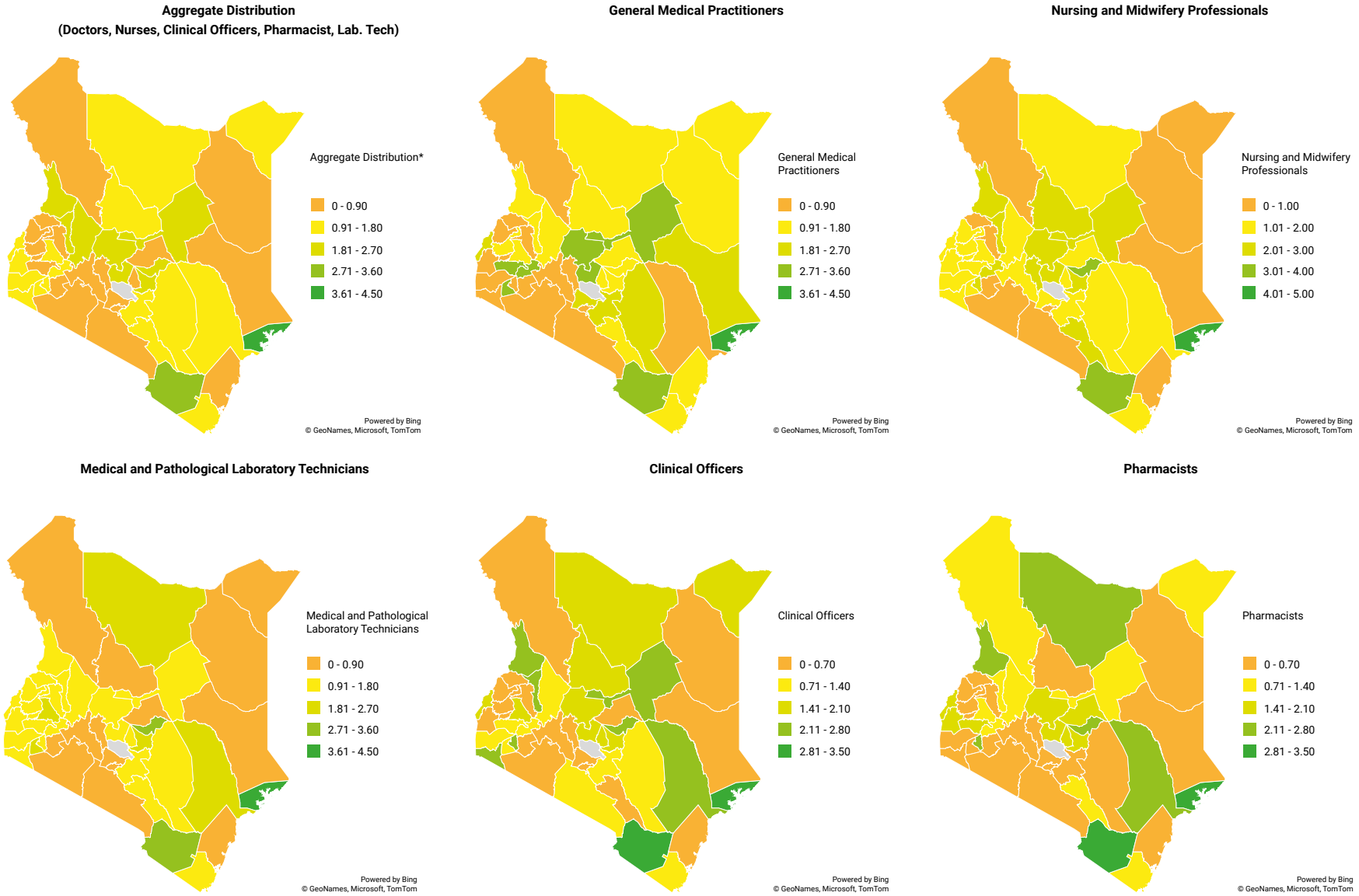
It is important to note that an ideal distribution of all cadres across districts may not be feasible. The national referral health facilities are few and but situated in the most urbanised locations. These facilities are often better equipped and required more specialized staff than primary level health facilities. Nevertheless, it is desirable to, as far as possible, reduce inequalities in the distribution of health workers (for all cadres) to engender equitable access to health services across the different strata of the population.

Table 13: Geographical equity index for selected HWF in the public sector

No	County	Population Distribution		Aggregate Distribution*			General Medical Practitioners			Nursing and Midwifery Professionals			Medical and Pathological Laboratory Technicians			Paramedical Practitioners/Clinical Officers			Pharmacist		
		Population (2021)	County % share (a)	Number	% share (b)	Equity Ratio (b/a)	Number	% share (c)	Equity Ratio (c/a)	Number	% share (d)	Equity Ratio (d/a)	Number	% share (e)	Equity Ratio (e/a)	Number	% share (f)	Equity Ratio (f/a)	Number	% share (g)	Equity Ratio (g/a)
1	Baringo	700,516	1.4%	1,020	1.9%	1.37	44	1.5%	1.08	587	1.9%	1.35	68	1.5%	1.08	115	1.6%	1.15	43	1.6%	1.15
2	Bomet	915,093	1.8%	702	1.3%	0.72	25	0.9%	0.47	415	1.3%	0.73	38	0.8%	0.46	96	1.4%	0.74	36	1.4%	0.74
3	Bungoma	1,762,311	3.5%	1,520	2.9%	0.81	48	1.7%	0.47	917	3.0%	0.84	152	3.4%	0.96	214	3.0%	0.85	59	2.2%	0.63
4	Busia	935,949	1.9%	1,045	2.0%	1.05	58	2.0%	1.07	586	1.9%	1.01	87	1.9%	1.04	159	2.2%	1.19	54	2.0%	1.08
5	Elgeyo Marakwet	479,533	1.0%	672	1.3%	1.32	29	1.0%	1.04	355	1.2%	1.20	47	1.1%	1.09	95	1.3%	1.39	33	1.2%	1.29
6	Embu	628,637	1.3%	1,138	2.2%	1.71	49	1.7%	1.34	687	2.2%	1.77	117	2.6%	2.07	126	1.8%	1.41	62	2.3%	1.85
7	Garissa	869,127	1.7%	753	1.4%	0.82	68	2.4%	1.35	363	1.2%	0.67	87	1.9%	1.11	85	1.2%	0.69	23	0.9%	0.50
8	Homa Bay	1,187,582	2.4%	1,343	2.5%	1.07	34	1.2%	0.49	768	2.5%	1.04	110	2.5%	1.03	219	3.1%	1.29	61	2.3%	0.96
9	Isiolo	279,137	0.6%	444	0.8%	1.50	34	1.2%	2.10	258	0.8%	1.49	34	0.8%	1.36	61	0.9%	1.53	14	0.5%	0.94
10	Kajiado	1,171,736	2.4%	724	1.4%	0.58	16	0.6%	0.24	500	1.6%	0.69	9	0.2%	0.09	147	2.1%	0.88	52	2.0%	0.83
11	Kakamega	1,957,470	3.9%	1,824	3.5%	0.88	89	3.1%	0.78	1,183	3.8%	0.98	126	2.8%	0.72	225	3.2%	0.81	70	2.6%	0.67
12	Kericho	944,985	1.9%	1,377	2.6%	1.37	92	3.2%	1.68	860	2.8%	1.47	109	2.4%	1.28	146	2.1%	1.08	71	2.7%	1.41
13	Kiambu	2,508,777	5.0%	2,073	3.9%	0.78	208	7.2%	1.43	1,219	4.0%	0.78	101	2.3%	0.45	211	3.0%	0.59	121	4.5%	0.90
14	Kilifi	1,537,730	3.1%	1,243	2.4%	0.76	93	3.2%	1.04	646	2.1%	0.68	71	1.6%	0.51	177	2.5%	0.81	38	1.4%	0.46
15	Kirinyaga	626,515	1.3%	852	1.6%	1.28	36	1.2%	0.99	454	1.5%	1.17	87	1.9%	1.55	142	2.0%	1.59	52	2.0%	1.55
16	Kisii	1,322,283	2.7%	1,645	3.1%	1.17	109	3.8%	1.42	998	3.2%	1.22	129	2.9%	1.09	237	3.3%	1.26	63	2.4%	0.89
17	Kisumu	1,211,373	2.4%	1,306	2.5%	1.02	127	4.4%	1.80	702	2.3%	0.94	97	2.2%	0.89	163	2.3%	0.94	105	3.9%	1.62
18	Kitui	1,184,000	2.4%	1,341	2.5%	1.07	105	3.6%	1.53	748	2.4%	1.02	116	2.6%	1.09	182	2.6%	1.08	72	2.7%	1.14
19	Kwale	921,082	1.8%	952	1.8%	0.98	55	1.9%	1.03	509	1.7%	0.89	98	2.2%	1.18	146	2.1%	1.11	51	1.9%	1.04
20	Laikipia	545,338	1.1%	914	1.7%	1.58	60	2.1%	1.89	550	1.8%	1.63	74	1.7%	1.51	107	1.5%	1.38	44	1.7%	1.51
21	Lamu	150,924	0.3%	682	1.3%	4.26	38	1.3%	4.33	457	1.5%	4.89	60	1.3%	4.43	68	1.0%	3.16	28	1.1%	3.47
22	Machakos	1,467,729	2.9%	1,419	2.7%	0.91	149	5.2%	1.75	791	2.6%	0.87	103	2.3%	0.78	189	2.7%	0.90	70	2.6%	0.89
23	Makueni	1,016,761	2.0%	1,251	2.4%	1.16	53	1.8%	0.90	802	2.6%	1.27	123	2.8%	1.35	122	1.7%	0.84	75	2.8%	1.38
24	Mandera	915,829	1.8%	824	1.6%	0.85	45	1.6%	0.85	449	1.5%	0.79	66	1.5%	0.80	141	2.0%	1.08	45	1.7%	0.92
25	Marsabit	483,383	1.0%	692	1.3%	1.35	29	1.0%	1.03	354	1.1%	1.18	83	1.9%	1.91	92	1.3%	1.33	42	1.6%	1.63
26	Meru	1,605,096	3.2%	1,795	3.4%	1.06	105	3.6%	1.13	1,064	3.5%	1.07	129	2.9%	0.89	224	3.2%	0.98	120	4.5%	1.40

No	County	Population Distribution		Aggregate Distribution*			General Medical Practitioners			Nursing and Midwifery Professionals			Medical and Pathological Laboratory Technicians			Paramedical Practitioners/Clinical Officers			Pharmacist		
		Population (2021)	County % share (a)	Number	% share (b)	Equity Ratio (b/a)	Number	% share (c)	Equity Ratio (c/a)	Number	% share (d)	Equity Ratio (d/a)	Number	% share (e)	Equity Ratio (e/a)	Number	% share (f)	Equity Ratio (f/a)	Number	% share (g)	Equity Ratio (g/a)
27	Migori	1,187,418	2.4%	1,301	2.5%	1.03	34	1.2%	0.49	677	2.2%	0.92	126	2.8%	1.18	285	4.0%	1.68	57	2.1%	0.90
28	Mombasa	1,266,511	2.5%	1,462	2.8%	1.09	107	3.7%	1.45	881	2.9%	1.12	127	2.8%	1.12	190	2.7%	1.05	82	3.1%	1.21
29	Muranga	1,089,720	2.2%	1,439	2.7%	1.25	51	1.8%	0.81	839	2.7%	1.24	187	4.2%	1.91	185	2.6%	1.19	54	2.0%	0.93
30	Nairobi	4,629,775	9.3%	3,222	6.1%	0.66	243	8.4%	0.90	1,948	6.3%	0.68	261	5.8%	0.63	414	5.8%	0.63	124	4.7%	0.50
31	Nakuru	2,265,829	4.6%	1,942	3.7%	0.81	52	1.8%	0.40	1,241	4.0%	0.88	124	2.8%	0.61	236	3.3%	0.73	90	3.4%	0.74
32	Nandi	919,865	1.8%	1,215	2.3%	1.25	48	1.7%	0.90	586	1.9%	1.03	130	2.9%	1.57	172	2.4%	1.31	57	2.1%	1.16
33	Narok	1,225,580	2.5%	813	1.5%	0.63	42	1.5%	0.59	423	1.4%	0.56	57	1.3%	0.52	135	1.9%	0.77	52	2.0%	0.79
34	Nyamira	632,653	1.3%	977	1.9%	1.46	30	1.0%	0.82	592	1.9%	1.51	111	2.5%	1.95	162	2.3%	1.80	82	3.1%	2.43
35	Nyandarua	657,435	1.3%	789	1.5%	1.13	21	0.7%	0.55	561	1.8%	1.38	63	1.4%	1.07	61	0.9%	0.65	7	0.3%	0.20
36	Nyeri	781,990	1.6%	1,408	2.7%	1.70	108	3.7%	2.38	842	2.7%	1.74	117	2.6%	1.67	163	2.3%	1.46	58	2.2%	1.39
37	Samburu	330,000	0.7%	462	0.9%	1.32	20	0.7%	1.04	307	1.0%	1.50	25	0.6%	0.84	62	0.9%	1.32	4	0.2%	0.23
38	Siaya	1,038,223	2.1%	1,096	2.1%	1.00	37	1.3%	0.61	748	2.4%	1.16	112	2.5%	1.20	99	1.4%	0.67	80	3.0%	1.44
39	Taita-Taveta	353,479	0.7%	1,015	1.9%	2.71	41	1.4%	2.00	571	1.9%	2.61	97	2.2%	3.06	166	2.3%	3.29	63	2.4%	3.34
40	Tana River	335,397	0.7%	405	0.8%	1.14	14	0.5%	0.72	189	0.6%	0.91	46	1.0%	1.53	82	1.2%	1.71	29	1.1%	1.62
41	Tharaka Nithi	408,761	0.8%	953	1.8%	2.20	28	1.0%	1.18	586	1.9%	2.32	97	2.2%	2.64	135	1.9%	2.32	52	2.0%	2.38
42	Trans Nzoia	1,038,119	2.1%	701	1.3%	0.64	36	1.2%	0.60	346	1.1%	0.54	108	2.4%	1.16	121	1.7%	0.82	47	1.8%	0.85
43	Turkana	994,088	2.0%	865	1.6%	0.82	40	1.4%	0.69	542	1.8%	0.88	63	1.4%	0.71	119	1.7%	0.84	52	2.0%	0.98
44	Uasin Gishu	1,218,837	2.4%	1,042	2.0%	0.81	34	1.2%	0.48	556	1.8%	0.74	115	2.6%	1.05	142	2.0%	0.82	57	2.1%	0.88
45	Vihiga	616,057	1.2%	525	1.0%	0.80	21	0.7%	0.59	272	0.9%	0.71	49	1.1%	0.89	85	1.2%	0.97	23	0.9%	0.70
46	Wajir	809,072	1.6%	670	1.3%	0.78	44	1.5%	0.94	368	1.2%	0.73	73	1.6%	1.00	62	0.9%	0.54	26	1.0%	0.60
47	West Pokot	669,178	1.3%	921	1.7%	1.30	44	1.5%	1.13	533	1.7%	1.29	63	1.4%	1.05	136	1.9%	1.43	60	2.3%	1.68
	Kenya	**49,796,883**	**100%**	**52,774**	**100%**	**7.31**	**2,893**	**100%**	**18.44**	**30,830**	**100%**	**9.09**	**4,472**	**100%**	**51.76**	**7,101**	**100%**	**6.13**	**2,660**	**100%**	**17.42**

Figure 21: Equity Heatmaps for Distribution of Selected Public Sector Health Workers in Kenya, 2020



Source: *HWF Data from NHWA; population data from KNBS.*

4.4 Health Workforce Migration

Health worker unemployment provides opportunity for seeking gainful employment. However, health workforce labour migration comes with its own risks. For instance, countries like Kenya maybe subsidizing education costs of health workforce for destination countries which are usually higher income countries and may also lose the critical cadres needed within the system. This means it needs to be appropriately managed based on best available evidence.

Both immigration and emigration are important in the Kenya context. Kenya is source country for high income countries and higher middle-income countries within the African region. Kenya has been excluded from the WHO the countries that require focused health workforce safeguards against unethical international recruitment[48] as its health system is considered considerably strong and will not be weakened by health worker migration. Based on this, Kenya currently in the process of developing a framework to guide health work force labour migration. It has also signed a bilateral agreement with the United Kingdom and there are plans for similar agreements with other high-income countries.

Kenya as source country: An assessment of intention to migrate for Kenya health workers showed the most preferred destination for Kenyan health workers (ranked by preference) was USA, followed by Namibia, Australia, Canada and the United Kingdom (UK). While there are no clear mechanisms in Kenya for tracking health worker immigration, some of the data from destination countries provide insights into the health worker inflows of Kenyan health workers.

The UK in accordance with WHO Global Code of Practice on Intranational Recruitment of Health Personnel has categorized countries into Red, Amber, Green (RAG) with active recruitment is not permitted from Red countries. Kenya is currently categorized as Amber meaning the United Kingdom can actively recruit from Kenya.

A review of data from the UK NHS[49] shows that Kenyan health workers were among the among the top African countries whose health workers are migrating to the UK NHS in 2019. It is 7th within the African region and ranks 30th globally in terms of contribution of health workers to the UK NHS (see Table 14).

Table 14: Ranking of source countries for all health workers in UK NHS

Rank	Country	All Health Workers in NHS	Position on the Global Contribution - All health workers
1	Nigeria	6,770	6
2	Zimbabwe	4,049	10

48 World Health Organization, Health Workforce Support and Safeguards List, 2020 (Geneva, Switzerland: World Health Organization, 2020), p. 2 <https://cdn.who.int/media/docs/default-source/health-workforce/hwf-support-and-safeguards-list8jan.pdf?sfvrsn=1a16bc6f_5>.

49 For England only. It Excludes Wales, Ireland and Scotland

Rank	Country	All Health Workers in NHS	Position on the Global Contribution - All health workers
3	Ghana	2,570	12
4	South Africa	1,663	19
5	Egypt	1,608	21
6	Mauritius	1,278	26
7	Kenya	742	31
8	Sudan	598	37
9	Sierra Leone	519	39
10	Uganda	516	40

Zooming into the nursing cadre who form the core of the African immigrants within the UK NHS, data from the UK Nursing Council shows that that Kenya ranked 6th within the Africa Region and 11th globally (Table 15). The recent escalation in the in the immigration of Kenya health workers to the NHS between 2017 to 2021 with a 23% increment from 31/03/2017 (571) to 30/09/2021 (703) with the biggest inflow noted in 2021 with 54 new Kenyan trained nurses registering in the UK NHS. However, it is important to note that due the more stringent requirements for registration as nurses, there is a growing trend of nurses within the Africa region going to the UK as "carers" implying an occupation change before registration. This implies that the official statistics may underestimate the actual inflows of nurses from countries like Kenya within the UK NHS.

Table 15: Ranking of source countries for nurses in UK NHS

Rank	Country	Nurses in UK NHS	Position on the Global Contribution - Nurses
1	Nigeria	4576	3
2	Zimbabwe	2575	4
3	South Africa	2552	5
4	Ghana	1781	6
5	Zambia	729	10
6	Kenya	703	11
7	Mauritius	379	15
8	Botswana	195	21
9	Malawi	165	25
10	Uganda	102	29

With immigration within the African region, data available from Namibia which was one of the indicated intention countries shows that for instance in 2017, about 7% of all the new nurses register in Namibia were from Kenya (i.e., 14 out of the 195 nurses)[50]. At the outbreak of COVID-19 pandemic, Kenya entered into a bilateral agreement with Seychelles where 55 health workers were deployed to support the country to respond to the pandemic.

50 Namibia Health Workforce Situational Analysis

Kenya as a destination country: Although there are emigration inflows of health workers into Kenya from other countries within the African Region especially from the East African countries, these has not been through structured agreements between countries. In terms of bilateral agreements, Kenya has an existing bilateral agreement with Cuba on health workforce that has promoted mutual benefits for both countries. As of 2021, 76 specialists emigrated in the country to support in service delivery in different counties. These are summarized in the Table 16. As the specialists deployed were based on expressed need by the counties, these inflows give insights into the specific cadres that maybe needed but are undersupplied across the different counties.

Table 16: Summary of Cuban specialists deployed across the different counties

#	Specialty Type	Number Deployed	Counties where the specialist was deployed
1	Anesthesiologist	8	Homa Bay, Kilifi, Kitui, Nandi, Narok, Nyandarua, Siaya, Trans Nzoia
2	Cardiologist	6	Embu, Kakamega, Kiambu, Machakos, Nakuru, Vihiga
3	Critical Care Specialist	7	Baringo, Bomet, Kericho, Makueni, Meru, Nandi, Narok
4	ENT Surgeon	3	Busia, Nairobi, Masarbit
6	Family Medicine	2	Baringo, Elgeyo Marakwet
7	Gastroenterologist	2	Migori, Uasin Gishu
8	General Surgeon	7	Kwale, Marsabit, Muranga, Siaya, Taita Taveta, Turkana, Uasin Gishu
9	Internal Medicine Physician	2	Bomet, Migori
10	Maxillofacial Surgeon	2	Kitui, Vihiga
11	Nephrologist	6	Kajiado, Kirinyaga, Laikipia, Nyeri, Taita Taveta, West Pokot
12	Neurologist	1	Makueni
13	Neurosurgeon	1	Machakos
14	Oncologist Clinical	4	Embu, Kirinyaga, Kisumu, Meru
15	Ophthalmologist	2	Laikipia, Samburu
16	Orthopaedic Surgeon	7	Busia, Kakamega, Kisumu, Nakuru, Nyamira, Nyandarua, Turkana
17	Pediatric Surgeon	1	Bungoma
18	Pathologist	2	Embu, Nairobi
19	Plastic Surgeon	3	Elgeyo Marakwet, Kisii, Muranga
20	Psychiatrist	1	Tharaka Nithi
21	Pulmonologist	1	Mombasa
22	Radiologist	4	Homa Bay, Kiambu, Kwale, Tharaka Nithi
23	Urologist	2	Bungoma, Trans Nzoia
24	Vascular Surgeon	2	Mombasa, Nyeri
	Total	**76**	

4.5 Health Workforce Education and Production capacity

Data from the Kenya Tertiary Education Commission (KTEC) show that there are about 76 accredited universities and university colleges in Kenya[51]. Out of this, 38 (50%) are offering various health science or health professions programmes. Twenty-four (24) out of the 38 (63.2%) of universities and university colleges offering health science or health professions programme are publicly owned while the 14 (36.8%) are private institutions. Additionally, there are Kenya Medical Training Centres (KMTCs) for the training of mid-level cadres of health workers.

Annual student enrolments: The estimated annual enrolment for these education institutions ranges from a high of 5,500 for the Kenya Registered Community Health Nurse Training Programme to a low of 12 for Speech Therapist. Other training programmes that enrol more than 1,000 students annually are those for Registered Clinical Officer (3,520), Nutritionist (1,871) and Public Health Officer (1,150). Estimated pass rates for the various training programmes ranges from 75% for Renal Nurse to 100% for Operating Theatre nurse and Paediatric Nurse (Table 14).

Between 2016/17 and 2017/18, the number of both undergraduate and post graduate students in the country declined substantially from 14,037 and 1,703, respectively before increasing to a peak of 19,040 and 3,160 students respectively in 2020/2021. With the exception of 2017/2018, the number of male undergraduate students was more than that of females. In the 2020/2021 academic year, there were more medicine & surgery enrolments (n = 4,466) than that of nursing (n = 3,903), but the occupational therapy (70) and medical psychology (68) had the least.

Gender distribution in enrolment: From 2016/2017 to 2020/2021, the number of male post-graduate students were more than that of females by at least 500 students. There are more female than male undergraduate students undertaking Nursing, Nutrition & Dietetics, Physiotherapy, Occupational Therapy and Community Health Development training.

Graduation rates: Between 2016 and 2019, an average of 3,900 health sciences undergraduate students graduated annually from the public and private universities in Kenya. Most of these graduates were female. The number of graduates from the Medicine and Surgery programme almost doubled between 2016 and 2019 from 320 to 628 graduates (96.3% increase within 3 years). Since 2016, the number of graduates from the pharmacy programme has fluctuated considerably, increasing by 84% from was 206 in 2016 to a peak of 379 graduates in 2018 before declining to 259 in 2019 (a decline of 31.7% from the 2018 level). For the nursing programme, the number of graduates declined consistently by 21% from 1,140 in 2016 to 900 in 2019. The biggest decline was however, recorded by the Medical Laboratory Sciences programme where in 2016 the number of graduates were 588, which declined by more 49% to 288 graduates in 2019. Over the 2016 to 2019 period, the number of health sciences students completing postgraduate degrees increased by 60% from about 400 to 640 graduates (Table 17).

51 Grace Njoroge, Presentation on "Transforming of Health professionals University Curriculum in Kenya". 7 February 2022. Kenya Health Care Workers Conference, Mombasa.

However, enrolments into the various programmes within the period appeared to have marginal increase, suggesting an increasing dropout rates or declining pass rates. Further exploration on the factors influencing the fluctuations in the number of annual graduates need to be explored further.

Cost of training: The average cost of tuition per year is highest for Medical Officers training programme, which is estimated to be KES 3.46 million followed by that of Registered Clinical Officer (KES 0.55 million), Kenya Registered Community Health Nurse (KES 0.45 million) and Public Health Officer (KES 0.44 million).

Table 17: Health Science Students in Public and Private Universities by Course and Sex, 2016–2020

Undergraduate Students	2015/16			2016/17			2017/18			2018/19			2019/20			2020/21*		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Medicine & Surgery	2,068	1,626	3,694	2,394	1,683	4,077	1,653	1,327	2,980	2,318	1,429	3,747	3,149	1,707	4,856	2,936	1,530	4,466
Dental Surgery	157	163	320	204	208	412	119	108	227	182	117	299	193	96	289	231	114	345
Pharmacy	544	454	998	822	690	1512	768	573	1,341	1032	717	1,749	1,218	791	2,009	1,025	609	1,634
Nursing	1,241	2,342	3,583	1,414	2,411	3,825	1,212	1,780	2,992	1,583	1,865	3,448	1,766	1,862	3,628	1,921	1,982	3,903
Clinical Medicine and Surgery	453	321	774	476	336	812	552	436	988	867	677	1,544	1076	793	1,869	786	576	1,362
Public Health	299	309	608	319	324	643	346	348	694	235	218	453	207	188	395	636	473	1,109
Medical Laboratory Sciences	841	469	1,310	868	516	1,384	623	469	1,092	698	526	1,224	613	438	1,051	1,158	689	1,847
Nutrition & Dietetics	323	546	869	364	512	876	369	570	939	419	585	1,004	274	578	852	250	574	824
Environmental Health	532	539	1,071	789	801	1,590	384	310	694	280	237	517	202	172	374	485	405	890
Physiotherapy	129	134	263	148	146	294	118	117	235	76	126	202	151	171	322	191	269	460
Occupational Therapy	17	15	32	22	17	39	24	36	60	19	30	49	11	14	25	29	41	70
Health Records Management	215	219	434	228	237	465	191	248	439	228	328	556	254	319	573	569	695	1,264
Health System Management							240	281	521	282	367	649	245	241	486	94	74	168
Community Health and Development							252	337	589	237	303	540	164	261	425	293	337	630
Medical Psychology	37	43	81	42	51	93	17	28	45	16	23	39	16	5	21	31	37	68
Sub-Total	**6,856**	**7,180**	**14,037**	**8,090**	**7,932**	**16,022**	**6,868**	**6,968**	**13,836**	**8,472**	**7,548**	**16,020**	**9,539**	**7,636**	**17,175**	**10,635**	**8,405**	**19,040**
Postgraduate students	1032	670	1,702	1,427	955	2,382	1,310	841	2,151	1,713	775	2,488	1,660	722	2,382	1,843	1,317	3,160
Grand Total	**7,888**	**7,850**	**15,739**	**9,517**	**8,887**	**18,404**	**8,178**	**7,809**	**15,987**	**10,185**	**8,323**	**18,508**	**11,199**	**8,358**	**19,557**	**12,478**	**9,722**	**22,200**

Table 18: Health Sciences Graduates from Public and Private Universities by Course and Sex, 2016–2020

Graduates	2016			2017			2018			2019			2020*		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Medicine & Surgery	172	148	320	212	202	414	225	116	341	335	293	628	65	37	102
Dental Surgery	9	16	25	16	17	33	21	15	36	39	30	69	9	12	21
Pharmacy	116	93	209	168	135	303	208	171	379	136	123	259	35	14	49
Nursing	428	712	1,140	477	656	1,133	379	691	1,070	403	497	900	97	182	279
Clinical Medicine and Surgery	98	78	176	95	56	151	116	81	197	92	127	219	68	47	115
Public Health	191	189	380	234	196	430	267	209	476	188	195	383	65	83	148
Medical Laboratory Sciences	320	268	588	275	216	491	286	233	519	160	128	288	56	32	88
Nutrition & Dietetics	203	323	526	160	305	465	202	283	485	102	254	356	7	35	42
Environmental Health	163	100	263	159	136	295	192	158	350	171	164	335	14	28	42
Physiotherapy	6	6	12	10	5	15	2	14	16	21	18	39	18	18	36
Occupational Therapy				4	6	10	15	20	35	9	10	19	7	4	11
Health Records Management	72	64	136	51	53	104	67	73	140	86	97	183	37	37	74
Health System Management										78	66	144	-	-	-
Community Health and Development										63	115	178	53	75	128
Sub-Total	**1,778**	**1,997**	**3,775**	**1,861**	**1,983**	**3,844**	**1,980**	**2,064**	**4,044**	**1,883**	**2,117**	**4,000**	**531**	**604**	**1,135**
Postgraduate	202	198	400	163	208	371	210	216	426	312	328	640	181	80	261
Total	**1,980**	**2,195**	**4,175**	**2,024**	**2,191**	**4,215**	**2,190**	**2,280**	**4,470**	**2,195**	**2,445**	**4,640**	**712**	**684**	**1,396**

Data Sources: *Triangulated from KNBS Statistical Abstracts, various years.*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Section 5

5. HEALTH LABOUR MARKET PROJECTIONS

5.1 Outlook of the Health Workforce Supply in Kenya, 2021-2036

Using a stock-and flow-method for supply projections[52], the baseline number of the health workforce in Kenya is estimated to record an average net increase of 3.4% per annum, ranging from 4.2% in 2021 to 2.7% by 2030. This will translate into adding nearly 7,650 health workers to the overall stock annually after offsetting for all forms of attrition, which was assumed to be an average of 1.7% across cadres.

The overall stock is expected to reach 226,434 by 2025 from 194,254, a 16.6% cumulative increase. The stock is further anticipated to reach 263,676 by 2030 which represents a further increase of 12.6% from the anticipated levels in 2025. If the supply dynamics remain fairly constant, it could further increase by 15.4%, bringing the overall stock of health workforce to over 304,351 across the public and private sectors by 2035.

Interestingly, the expected rate of growth for nurses and midwives appears to be considerably lower than the overall outlook whereby the nurses and midwives' growth rate is estimated around 1.5% per annum or 7-8% every 5 years. At this rate, the country will make a net addition of only 28,000 nurses within 15 years. Therefore, the baseline stock of 109,659 Kenya Registered Community Health Nurses is projected to reach 137,617 (25.5% net increase) by 2036.

The expected output of medical laboratory technologists shows that the baseline stock of 18,198 is likely to increase by 8.2% to 19,697 by 2025 and up to 26.5% from the baseline stock to 23,023 by 2035. Similarly, the rate of increase in medical officers is expected to remain fairly constant at a rate of 3% to 4% every 5 years whiles specialists rate of change could be much higher. General practitioners' stock is expected to increase by only 7% from 11,129 in 2021 to 11,893 by 2030, with a further increase of 11% by 2035.

The recent trend of admissions in pharmacy suggests that their stock would likely increase by 14.1% by 2025 and further increase of roughly 15.9% and 18% in 2030 and 2035, respectively. Thus, the stock of pharmacists may increase from 4,069 to 5,912 by 2035 if there are no interventions to expand training. However, that of pharmacy technologist could increase by a paltry 4% every 5 years – average annual increase of 0.8% (range: 0.7 -1%). The prevailing training output for pharmacy technologists appear to be on a decellerating pace and would likely result in only 12.2% increase in the aggregate stock from 11,429 in 2021 to 12,825 by 2035. Table 19 provides details of the projected supply of 30 categories of health workers in Kenya if the current trend continued without interventions to either abate or accelerate the production.

52 MOH, Health Labour Market Analysis Report for Rwanda.

Table 19: Projected Health Workforce Supply, 2021–2036

SN	Health Professionals	Estimated Aggregate Supply															
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
1	Medical officer	11,129	11,220	11,309	11,397	11,483	11,568	11,651	11,733	11,814	11,893	11,971	12,047	12,122	12,196	12,269	12,340
2	Obstetrician &Gynecologist	402	454	504	554	603	652	699	746	792	837	881	924	967	1,009	1,051	1,091
3	Ophthamologist	104	161	216	271	325	378	430	481	532	581	630	678	725	771	816	861
4	Pediatrician	343	396	447	498	548	598	646	693	740	786	831	876	919	962	1,004	1,046
5	Physician (internal medicine)	347	400	451	502	552	601	649	697	744	789	835	879	922	965	1,007	1,049
6	Psychiatrist	70	127	184	239	293	347	400	451	502	552	601	649	697	744	789	835
7	Surgeon	332	397	460	522	584	644	703	761	819	875	930	985	1,038	1,091	1,142	1,193
8	Pathologist	65	122	179	234	289	342	395	447	498	548	597	645	693	740	786	831
9	Operating Theatre nurse	N/D	180	357	531	702	870	1,035	1,198	1,357	1,514	1,668	1,820	1,969	2,116	2,260	2,401
10	Kenya Registered Community Health Nurse	109,659	111,755	113,815	115,840	117,831	119,788	121,711	123,602	125,461	127,288	129,084	130,850	132,585	134,291	135,968	137,617
11	Mental Health/Psychiatry Nurse	N/D	72	143	212	281	348	414	479	543	606	667	728	788	846	904	960
12	Critical care Nurse	N/D	122	241	358	474	587	699	808	916	1,022	1,126	1,228	1,329	1,428	1,525	1,621
13	Paediatric Nurse	N/D	60	119	177	234	290	345	399	452	505	556	607	656	705	753	800
14	Kenya Registered Midwife	N/D	216	428	637	842	1,044	1,242	1,437	1,629	1,817	2,002	2,184	2,363	2,539	2,712	2,881
15	Registered Clinical Officer	21,797	24,216	26,595	28,933	31,231	33,490	35,711	37,893	40,039	42,149	44,222	46,260	48,264	50,233	52,169	54,073
16	Anaesthetist Clinical Officer	932	1,177	1,418	1,655	1,888	2,117	2,342	2,563	2,780	2,994	3,204	3,411	3,614	3,813	4,010	4,202
17	Lung & Skin Clinical officer	272	357	441	524	605	685	763	840	916	990	1,063	1,135	1,206	1,275	1,344	1,411
18	Paediatric Clinical Officer	512	593	673	752	829	905	980	1,053	1,125	1,196	1,266	1,334	1,401	1,467	1,533	1,596
19	Reproductive Health Clinical Officer	132	197	261	324	386	447	507	566	624	681	737	792	846	899	951	1,003
20	Dental surgeon	1,344	1,346	1,349	1,351	1,353	1,355	1,358	1,360	1,362	1,364	1,366	1,368	1,370	1,372	1,374	1,375
21	Community Oral Health Officer	N/D	41	80	119	158	196	233	269	305	341	375	409	443	476	508	540
22	Pharmacist	4,069	4,216	4,360	4,502	4,642	4,779	4,913	5,046	5,176	5,304	5,430	5,554	5,675	5,795	5,912	6,028
23	Pharmaceutical Technologist	11,429	11,540	11,650	11,757	11,863	11,966	12,069	12,169	12,267	12,364	12,460	12,553	12,646	12,736	12,825	12,913
24	Physiotherapist	1,757	2,114	2,465	2,810	3,149	3,483	3,810	4,132	4,449	4,760	5,066	5,367	5,663	5,953	6,239	6,520

SN	Health Professionals	Estimated Aggregate Supply															
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
25	Occupational Therapist	553	706	856	1,003	1,148	1,290	1,431	1,568	1,704	1,837	1,967	2,096	2,222	2,347	2,469	2,589
26	Orthopaedic Technologist	287	313	338	363	387	411	435	458	481	504	526	547	569	590	610	630
27	Clinical Dietician	N/D	650	1,289	1,917	2,534	3,141	3,737	4,324	4,900	5,467	6,024	6,571	7,109	7,638	8,158	8,670
28	Nutritionist	10,521	10,770	11,014	11,254	11,490	11,723	11,951	12,175	12,396	12,613	12,826	13,035	13,241	13,443	13,642	13,838
29	Speech Therapist	N/D	8	17	25	32	40	48	55	63	70	77	84	91	98	105	111
30	Medical Laboratory Technologist	18,198	18,582	18,960	19,332	19,697	20,056	20,408	20,755	21,096	21,431	21,761	22,085	22,403	22,716	23,023	23,326
	Kenya	**194,254**	**202,507**	**210,620**	**218,595**	**226,434**	**234,140**	**241,715**	**249,161**	**256,481**	**263,676**	**270,749**	**277,702**	**284,536**	**291,255**	**297,859**	**304,351**
	% net increase		**4.2%**	**4.0%**	**3.8%**	**3.6%**	**3.4%**	**3.2%**	**3.1%**	**2.9%**	**2.8%**	**2.7%**	**2.6%**	**2.5%**	**2.4%**	**2.3%**	**2.2%**

N/D = There was no disaggregated baseline stock data, but data on annual intake and/or graduates was available.

5.2 Projected Need for Health Workers Based on the Population's Need for Health Services

Using a need-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 22, the overall need for health workers across 31 occupations was estimated to be 254,220 in 2021. This need is, however, expanding rapidly at an average rate of 4.7% per annum, ranging from 3.9% to 6.2% depending on the anticipated dynamics in disease burden and the resultant population's need for health services. Therefore, the cumulative need for these health workers would likely be 299,452 by 2025 and up to 476,278 by 2035.

For doctors, based on the population health needs, Kenya needed at least 25,100 medical officers in 2021, which is anticipated to increase almost three-fold to 71,643 within 15 years (by 2035). This translates into a minimum need of 5 generalist doctors (medical officers) per 10,000 population or approximately 1 doctor for every 2,000 population if universal coverage of health services is to be achieved.

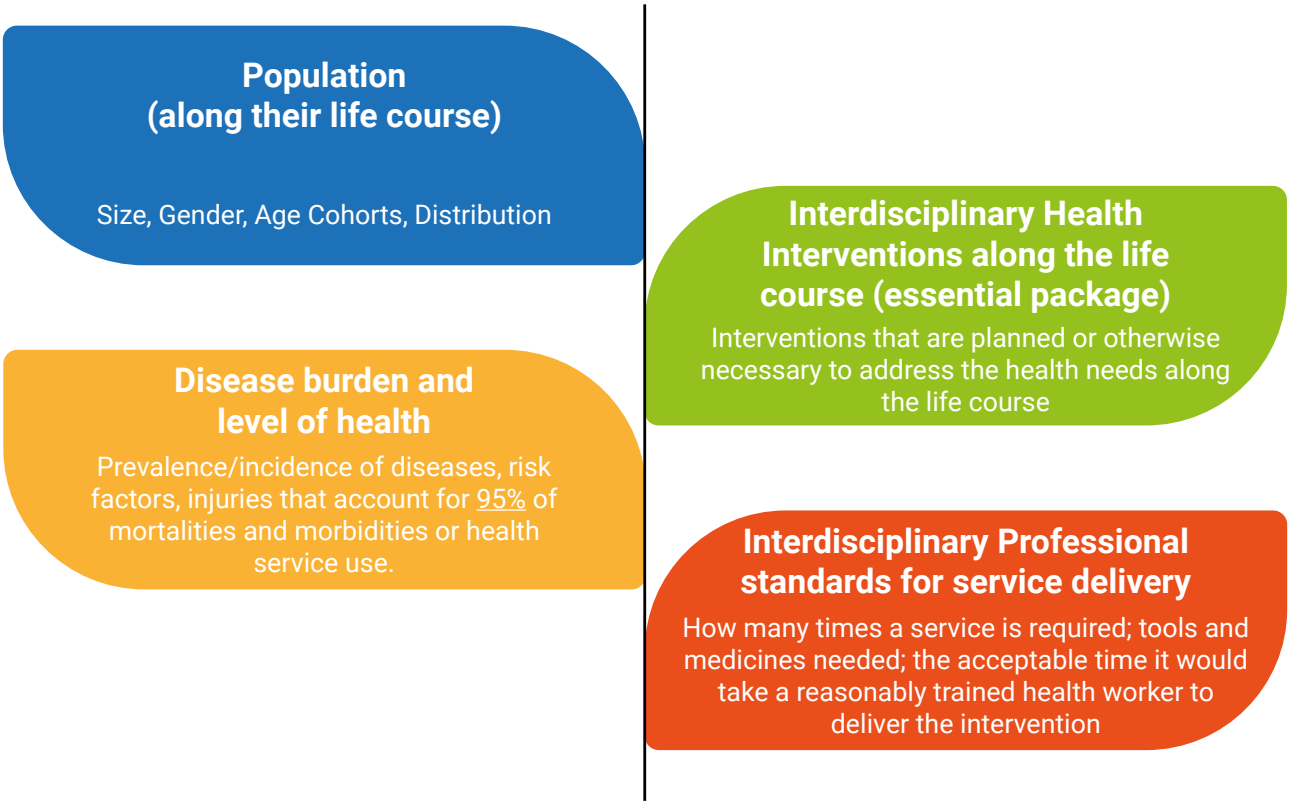
Also, across five broad areas of medical specialities (obstetrics & gynaecology, ophthalmology, paediatrics, internal medicine, psychiatry, surgery, and pathology), Kenya's disease burden and population demographics needed at least 4,863 specialist doctors in 2021, which is anticipated to increase to about 5,427, representing a 11.2% increase by 2025. By 2030, at least 6,551 medical specialists are required (17% increase from the 2025 requirement) to address the changing dynamics of the diseases and population structure should the model of service delivery remain the same. A further increase of 23.7% is anticipated to 8,474 by 2035 if aforementioned variables affecting the need for medical specialists remain the same. The aforesaid also translates into a ratio of one medical specialist per 12,500 population or a density of 8 per 100,000 population.

One observation worth noting is the lack of clearly distinguished scope of practice between clinical officer and doctors and to some extent, nurses/midwives. This made it challenging to determine at the primary and secondary level of care, activities or interventions that are exclusively carried out by doctors and/or clinical officers. There will, thus, be some degree of overlap between the estimated need-based requirement for doctors and clinical officers. With this caveat, based on the prevailing health service delivery model, the need for clinical officers (of all generalist and specialised ones) appears to be on the ascendency, increasing by 13% from 38,665 in 2021 to 43,707 by 2025 and further 23% increase to 53,706 by 2030. If the factors affecting the need for clinical officers remain the same, their need could be more than 70,000 by 2035, an increase of 31% from the number needed in 2030. This could, however, be ameliorated if task-shifting and/or accelerating the training of doctors is pursued.

Similarly, in 2021 about 5,987 pharmacists and clinical pharmacists were needed in Kenya across the public and private sectors, which is likely to increase by 16.4% to 6,970 in 2025. Under this trajectory, it is anticipated that the need for pharmacist and clinical pharmacist could increase

by 90% within 10 years from the levels required in 2025 to 13,304 in another 5 years. For nurses and midwives, the need is projected to increase from 142,737 in 2021 to 191,639 by 2030, a 34.3% increase in the need for nurses/midwives over a period of 9 years. By 2035, at least 228,403 nurses and midwives of various disciplines would be needed in Kenya based on the evolving disease burden and population demography. Nonetheless, given Kenya's agenda to export nurses, it would be imperative to produce more than this estimated need to ensure that the managed outmigration does not compromise the aspiration for universal health coverage. Table 20 provides details of the year-by-year projected need for health professionals across 31 occupations in in Kenya up to 2035.

Figure 22: Parameters used for analysing the need for health workers



Download an excel tool for analysis from:
https://doi.org/10.1371/iournal.pone.0257957.s002

A need-based approach that makes an "***... explicit consideration of population health needs, direct measures of levels of health that give rise to need for care - and the planned number and type of services to be provided to address those needs***" (Tomblin Murphy et al., 2012).

Table 20: Projected Need-based requirements for health workers, 2021–2036

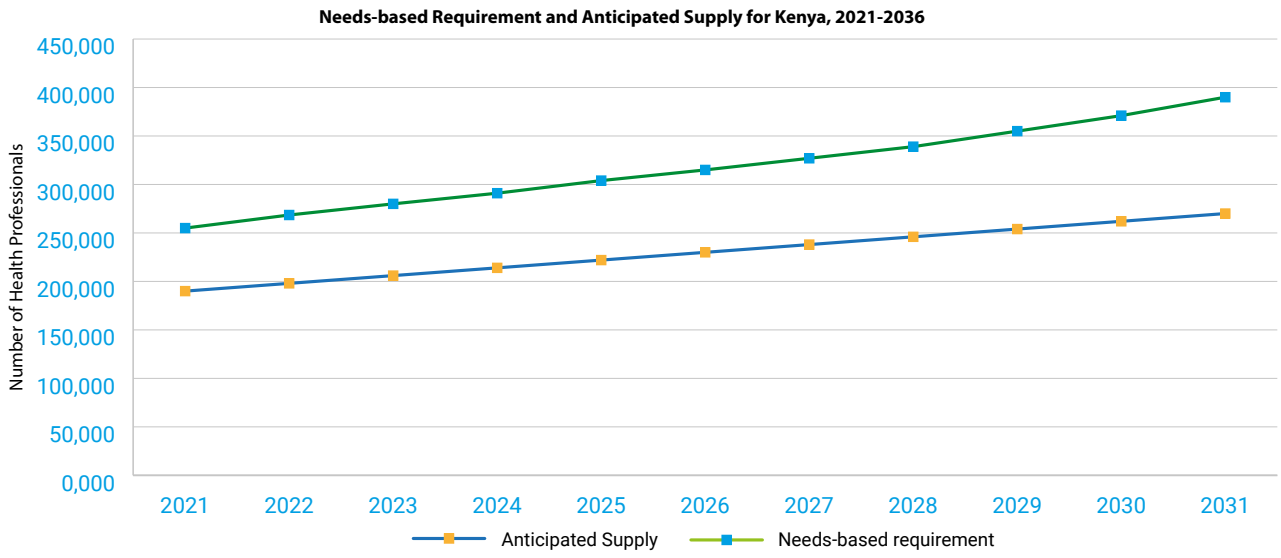
No.	Health Professionals	Projected Need for Health Workers based Population Health Needs (Displayed in Headcounts & Densities															
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
1	Medical officer	25,100	26,905	28,908	31,136	33,532	35,864	38,188	40,797	43,731	47,037	51,087	55,310	60,089	65,502	71,643	78,616
2	Obstetrician &Gynecologist	535	547	559	571	583	596	609	623	636	650	665	679	694	709	725	741
3	Ophthamologist	467	487	509	533	560	589	621	657	697	741	791	846	909	979	1,059	1,148
4	Pediatrician	569	549	532	517	504	472	463	456	450	445	426	424	422	422	422	423
5	Physician (internal medicine)	426	440	455	472	491	516	539	564	591	622	661	699	742	790	843	904
6	Psychiatrist	159	156	153	152	150	152	152	152	153	154	157	159	161	163	165	168
7	Surgeon	2,475	2,565	2,664	2,770	2,886	3,012	3,151	3,303	3,471	3,656	3,861	4,090	4,344	4,628	4,946	5,303
8	Pathologist	232	237	243	248	253	260	266	271	277	283	291	297	304	310	317	324
9	Operating Theatre nurse	3,560	3,639	3,719	3,801	3,884	3,969	4,057	4,146	4,237	4,330	4,426	4,523	4,622	4,724	4,828	4,934
10	Kenya Registered Community Health Nurse	136,321	141,503	147,035	152,948	158,995	163,722	168,386	173,336	178,605	184,230	191,005	197,493	204,483	212,039	220,233	229,148
11	Mental Health/Psychiatry Nurse	729	711	697	686	679	680	677	677	678	681	695	701	708	716	726	736
12	Critical care Nurse	720	736	752	769	786	803	821	839	857	876	896	915	936	956	977	999
13	Paediatric Nurse	981	979	978	979	982	975	981	989	997	1,007	1,010	1,022	1,035	1,049	1,064	1,080
14	Kenya Registered Midwife	424	433	443	452	462	472	483	493	504	515	527	538	550	562	575	587
15	Registered Clinical Officer	35,101	36,120	37,245	38,487	39,857	41,604	43,279	45,131	47,182	49,456	52,236	55,056	58,202	61,718	65,655	70,071
16	Anaesthetist Clinical Officer	2,992	3,058	3,126	3,195	3,265	3,337	3,411	3,487	3,564	3,643	3,724	3,806	3,891	3,977	4,066	4,157
17	Lung & Skin Clinical officer	43	44	45	46	47	49	50	51	52	53	55	56	57	58	60	61
18	Paediatric Clinical Officer	457	457	457	458	459	454	456	459	463	466	465	469	474	480	485	491
19	Reproductive Health Clinical Officer	72	74	75	77	79	80	82	84	86	88	90	92	94	96	98	100
20	Dental surgeon	4,145	4,237	4,330	4,425	4,522	4,687	4,790	4,896	5,004	5,114	5,310	5,427	5,546	5,668	5,793	5,920
21	Community Oral Health Officer	1,445	1,477	1,509	1,543	1,577	1,600	1,635	1,671	1,708	1,746	1,799	1,839	1,879	1,920	1,963	2,006
22	Pharmacist	5,094	5,273	5,468	5,682	5,919	6,211	6,502	6,824	7,183	7,584	8,063	8,566	9,130	9,764	10,478	11,284
23	Clinical pharmacist	893	927	965	1,006	1,051	1,103	1,157	1,217	1,283	1,356	1,441	1,532	1,634	1,748	1,876	2,020
24	Pharmaceutical Technologist	4,685	4,992	5,336	5,723	6,159	6,702	7,260	7,892	8,608	9,421	10,397	11,448	12,643	14,005	15,557	17,326

No.	Health Professionals	Projected Need for Health Workers based Population Health Needs (Displayed in Headcounts & Densities															
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
25	Physiotherapist	3,742	3,877	4,024	4,183	4,355	4,400	4,603	4,826	5,072	5,343	5,513	5,844	6,214	6,628	7,092	7,612
26	Occupational Therapist	3,543	3,621	3,700	3,782	3,865	3,763	3,846	3,930	4,017	4,105	4,012	4,100	4,190	4,283	4,377	4,473
27	Orthopaedic Technologist	81	82	84	86	88	90	92	94	96	98	100	102	105	107	109	112
28	Clinical Dietician	1,244	1,238	1,233	1,229	1,225	1,214	1,211	1,209	1,207	1,205	1,199	1,198	1,198	1,197	1,197	1,198
29	Nutritionist	5,471	5,626	5,805	6,008	6,240	6,455	6,756	7,096	7,480	7,916	8,374	8,934	9,568	10,287	11,103	12,029
30	Speech Therapist	242	248	253	259	264	270	276	282	288	295	301	308	315	322	329	336
31	Medical Laboratory Technologist	11,909	12,622	13,422	14,323	15,338	16,553	17,849	19,316	20,978	22,863	25,077	27,512	30,282	33,435	37,028	41,123
32	Orthopedic Trauma Technologist	361	369	377	386	394	403	412	421	430	439	449	459	469	479	490	501
	Kenya	**254,220**	**264,230**	**275,103**	**286,932**	**299,452**	**311,060**	**323,060**	**336,187**	**350,584**	**366,419**	**385,101**	**404,445**	**425,890**	**449,724**	**476,278**	**505,931**
	Net Increase per year		**10,009**	**10,873**	**11,828**	**12,521**	**11,607**	**12,001**	**13,126**	**14,397**	**15,835**	**18,682**	**19,344**	**21,445**	**23,834**	**26,554**	**29,654**
	% net increase		**3.9%**	**4.1%**	**4.3%**	**4.4%**	**3.9%**	**3.9%**	**4.1%**	**4.3%**	**4.5%**	**5.1%**	**5.0%**	**5.3%**	**5.6%**	**5.9%**	**6.2%**
	Aggregate % change from the baseline		**3.9%**	**8.2%**	**12.9%**	**17.8%**	**22.4%**	**27.1%**	**32.2%**	**37.9%**	**44.1%**	**51.5%**	**59.1%**	**67.5%**	**76.9%**	**87.3%**	**99.0%**

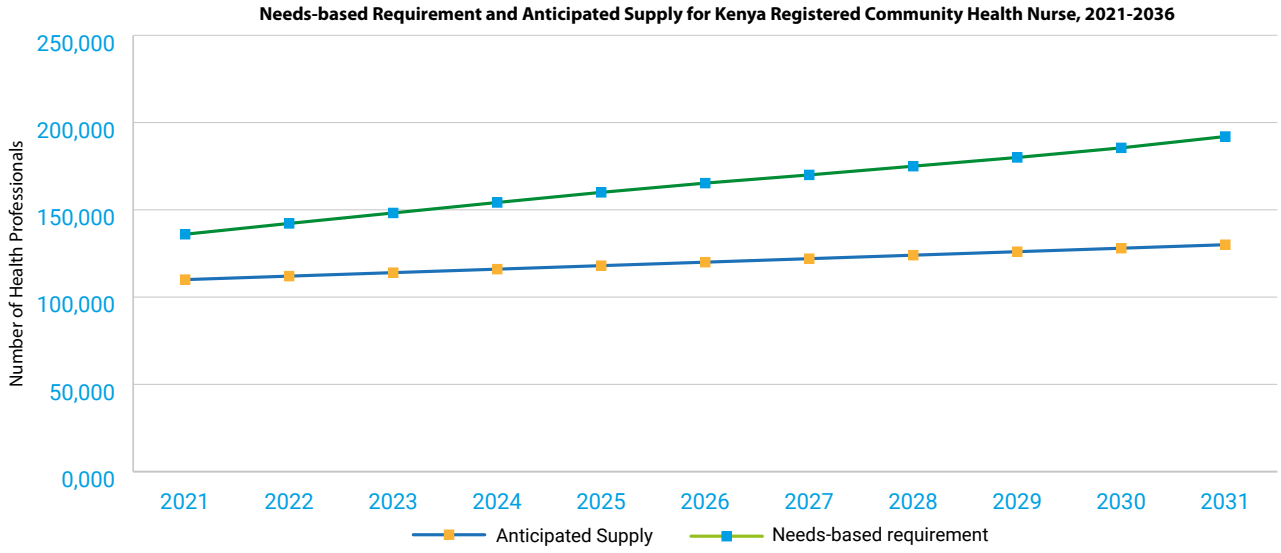
5.3 Analysis of Need and Supply Gaps and Mismatches

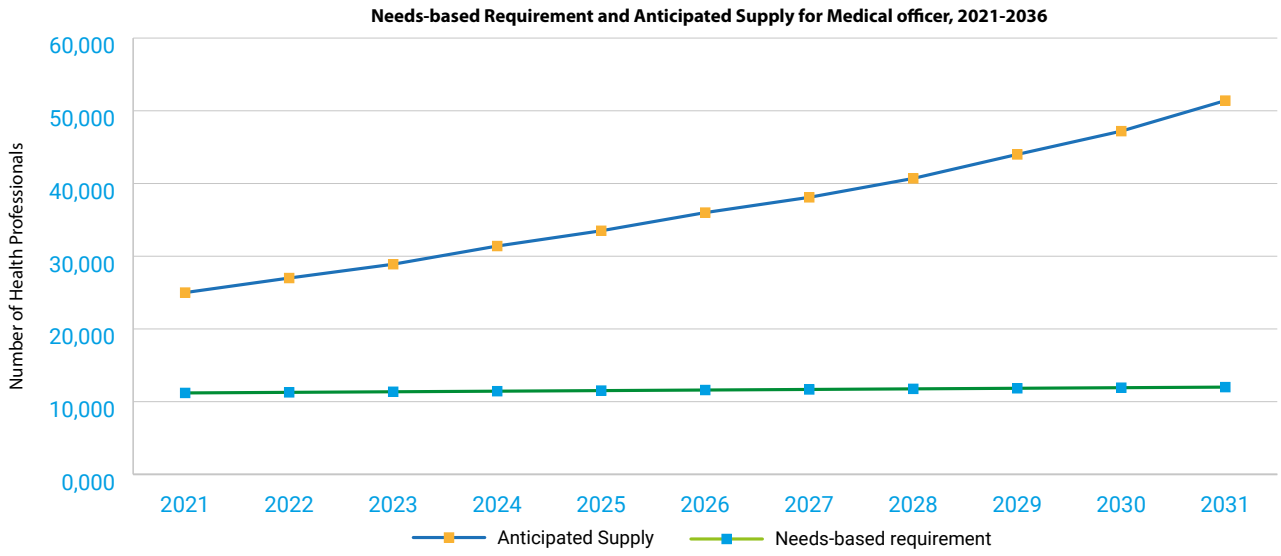
At baseline, Kenya's stock of health workforce covers 76.4% of the need for the health professionals included in the analysis, leaving a gap of 23.6%, translating into a need-based shortage of 59,966 health professionals across 31 occupations. Without appropriate mechanisms to boost the production, absorption and retention of these health professionals, the ratio of future supply to the need (staff availability ratio, SAR) is likely marginally decline to 75.3% by 2026, and further nosedive to 70.3% in 2031 and a risk of decreasing further 60.2% by 2035 – below a critical SAR benchmark of 70% needed to make significant progress towards UHC[53]. In absolute terms, shortage of health professionals could worsen from 59,966 in 2021 to 114,352 by 2030 and up to 201,581 by 2035 if nothing is done to boost the system capacity for increased training, absorption and retention. This potential widening in the need-based shortage of health workers is attributable to a faster rate of expansion in the need for health services due to increasing population and the evolving triple burden of disease on the one hand, and on the other hand, a seeming decreasing rate of growth in the supply of health workers. As demonstrated in the previous sections, while the aggregate health workforce stock is increasing at a rate of 3.4% (range: 2.7% - 4.2%) annually, that of the population's health need is expanding at 4.7% (range: 3.9% - 6.2%) annually. Consequently, a widening gap of 1.3% per annum (range: 1.2 – 2%) between the aggregate need and the supply is anticipated (see Figure 23 and Table 21).

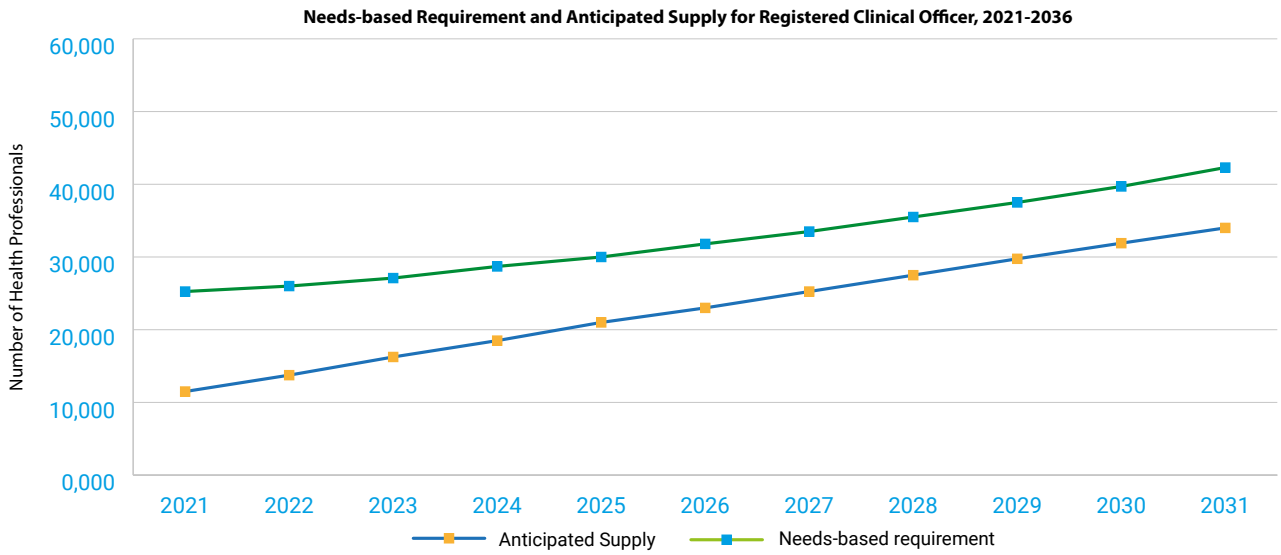
Figure 23: Aggregate Need versus Supply of Health Workers in Kenya, 2021–2036



53 WHO/AFRO, Health Workforce Thresholds for Supporting Attainment of Universal Health Coverage in the African Region (Brazzaville, Republic of Congo: World Health Organization, Regional Office for Africa, 2021).


Needs-based Requirement and Anticipated Supply for Kenya Registered Community Health Nurse, 2021-2036
Number of Health Professionals
250,000
200,000
150,000
100,000
50,000
0,000
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Anticipated Supply
Needs-based requirement


Needs-based Requirement and Anticipated Supply for Medical officer, 2021-2036
Number of Health Professionals
60,000
50,000
40,000
30,000
20,000
10,000
0,000
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Anticipated Supply
Needs-based requirement


Needs-based Requirement and Anticipated Supply for Registered Clinical Officer, 2021-2036
Number of Health Professionals
60,000
50,000
40,000
30,000
20,000
10,000
0,000
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Anticipated Supply
Needs-based requirement

Beneath the aggregate estimates are huge imbalances for 10 out of 32 health professionals considered in this analysis (31%), the projected supply will likely fail to meet even 50% of the need-based requirement by 2026 and 9 out 32 (28%) will not meet of requirements by 2031 if no corrective intervention(s) is undertaken to enhance health professions education. In particular, the stock of 332 surgeons (across all sub-specialties) covers only 13.4% of the 2,475 that was needed in Kenya in 2021. Although, this is expected to improve, the supply of surgeons would likely meet less than a quarter (21.4%) of the need for surgeons by 2026 and 24.1% by 2030 – leaving an expected need-based shortage of 2931 surgeons of all sub-disciplines by 2031. Similar patterns are observed for most medical specialists and other specialized professionals. In contrast, the existing stock of obstetricians and gynaecologists covers roughly 75% of the country's need and could reach equilibrium by 2025 if the output from training is maintained and the graduate retained.

Furthermore, the stock of Kenya Registered Community Health Nurses at baseline (2021) met at least 80% of the need-based requirement. However, the rate of expansion in the need for nurses, which is estimated to be 3.5% annually (ranging from 2.8 – 4%) is rapidly outpacing the rate of increase of 1.5% per annum (range: 1.2 -1.9%) in the supply of nurses. This could result in a large deficit of nurses in the future, from 26,662 in 2021 up to 61,921 by 2031 if the current intake of 5,500 is not expanded. Without expanded training and more importantly, absorption, by 2031, Kenya could effectively have just 68% of the needed nurses as a result of the need outpacing the supply in the rates of increase.

Also, about 80% of the need for pharmacists in 2021 appear to have been met (5,094 needed vs 4,069 stock) as a result of a recent acceleration in the enrolment of students into pharmacy programmes. However, the current rates of enrolment seem to have decreased and the country's stock of pharmacists could cover 77% of its need by 2026 (6,211 needed vs 4779 to be supplied), which could decline further to 67% leaving a need-based shortage of 2,634 pharmacists by 2031. This excludes specialist pharmacists. Nevertheless, the economic demand for pharmacists especially from the private sector appear to be on the ascendency and could exacerbate the shortages of pharmacist. A recent news reportage[54] highlighted the dire shortage of pharmacy professionals in one the Counties which does not only corroborate this analysis but also underlines the urgent need to scale-up the training of the mid-level pharmacy professionals, the pharmacy technologist who's trained seemed to have slowed down in the recent past.

Overall, seven out the 32 occupational group analysed (22%) seem to have their baseline supply levels commensurate with or even surpasses that of their respective need-based requirements. In the long-term, the training of these could be adjusted in line with the needs, which covers both the public and private sectors. Table 18 provides detailed comparison of the need versus supply of various health occupations in both absolute (shortages or surplus) and in relative terms. Additionally, Table 19 provides highlights of need-based adjustment required in enrolments into health training institutions to addresses the gaps identified.

54 Nation News Paper, 'Report Reveals Poor State of Some Nakuru Dispensaries', Nation, 2020 <https://nation.africa/kenya/counties/nakuru/report-reveals-poor-state-of-some-nakuru-dispensaries-218432> [accessed 11 May 2022].

Table 21: Projected Need-based requirements versus projected supply gap analysis for health workers, 2021–2036

No.	Health professionals	2021				2026				2031			
		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)
1	Medical officer	25,100	11,129	(13,971)	44.3%	35,864	11,568	(24,296)	32.3%	51,087	11,971	(39,117)	23.4%
2	Obstetrician &Gynecologist	535	402	(133)	75.2%	596	652	56	109.3%	665	881	216	132.6%
3	Ophthamologist	467	104	(363)	22.2%	589	378	(211)	64.2%	791	630	(161)	79.7%
4	Pediatrician	569	343	(226)	60.3%	472	598	125	126.5%	426	831	405	195.2%
5	Physician(internal Medicine)	426	347	(79)	81.5%	516	601	85	116.4%	661	835	173	126.2%
6	Psychiatrist	159	70	(89)	44.1%	152	347	195	228.2%	157	601	444	382.1%
7	Surgeon	2,475	332	(2,143)	13.4%	3,012	644	(2,368)	21.4%	3,861	930	(2,931)	24.1%
8	Pathologist	232	65	(167)	28.0%	260	342	83	131.8%	291	597	306	205.4%
9	Operating Theatre nurse	3,560	-	(3,560)	0.0%	3,969	870	(3,099)	21.9%	4,426	1,668	(2,757)	37.7%
10	Kenya Registered Community Health Nurse	136,321	109,659	(26,662)	80.4%	163,722	119,788	(43,935)	73.2%	191,005	129,084	(61,921)	67.6%
11	Mental Health/Psychiatry Nurse	729	-	(729)	0.0%	680	348	(332)	51.1%	695	667	(28)	96.0%
12	Critical care Nurse	720	-	(720)	0.0%	803	587	(216)	73.1%	896	1,126	231	125.7%
13	Paediatric Nurse	981	-	(981)	0.0%	975	290	(685)	29.7%	1,010	556	(454)	55.1%
14	Kenya Registered Midwife	424	-	(424)	0.0%	472	1,044	572	221.0%	527	2,002	1,475	380.1%
15	Registered Clinical Officer	35,101	21,797	(13,304)	62.1%	41,604	33,490	(8,114)	80.5%	52,236	44,222	(8,014)	84.7%
16	Anaesthetist Clinical Officer	2,992	932	(2,060)	31.1%	3,337	2,117	(1,221)	63.4%	3,724	3,204	(519)	86.1%
17	Lung & Skin Clinical officer	43	272	229	626.1%	49	685	636	1405.3%	55	1,063	1,009	1947.1%
18	Paediatric Clinical Officer	457	512	55	112.1%	454	905	451	199.5%	465	1,266	801	272.4%
19	Reproductive Health Clinical Officer	72	132	60	183.3%	80	447	367	557.0%	90	737	647	822.5%
20	Dental surgeion	4,145	1,344	(2,801)	32.4%	4,687	1,355	(3,332)	28.9%	5,310	1,366	(3,944)	25.7%
21	Community Oral Health Officer	1,445	-	(1,445)	0.0%	1,600	196	(1,404)	12.2%	1,799	375	(1,424)	20.9%

No.	Health professionals	2021				2026				2031			
		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)
22	Pharmacist	5,094	4,069	(1,025)	79.9%	6,211	4,779	(1,432)	76.9%	8,063	5,430	(2,634)	67.3%
23	Clinical pharmacist	893	-	(893)	0.0%	1,103	-	(1,103)	0.0%	1,441	-	(1,441)	0.0%
24	Pharmaceutical Technologist	4,685	11,429	6,744	243.9%	6,702	11,966	5,264	178.6%	10,397	12,460	2,063	119.8%
25	Physiotherapist	3,742	1,757	(1,985)	47.0%	4,400	3,483	(918)	79.1%	5,513	5,066	(446)	91.9%
26	Occupational Therapist	3,543	553	(2,990)	15.6%	3,763	1,290	(2,473)	34.3%	4,012	1,967	(2,044)	49.0%
27	Orthopaedic Technologist	81	287	206	356.2%	90	411	322	458.0%	100	526	425	524.8%
28	Clinical Dietician	1,244	-	(1,244)	0.0%	1,214	3,141	1,927	258.7%	1,199	6,024	4,825	502.5%
29	Nutritionist	5,471	10,521	5,050	192.3%	6,455	11,723	5,267	181.6%	8,374	12,826	4,451	153.2%
30	Speech Therapist	242	-	(242)	0.0%	270	40	(230)	14.9%	301	77	(224)	25.6%
31	Medical Laboratory Technologist	11,909	18,198	6,289	152.8%	16,553	20,056	3,503	121.2%	25,077	21,761	(3,317)	86.8%
32	Orthopedic Trauma Technologist	361	-	(361)	0.0%	403	-	(403)	0.0%	449	-	(449)	0.0%
	Kenya	**254,220**	**194,254**	**(59,966)**	**76.4%**	**311,060**	**234,140**	**(76,920)**	**75.3%**	**385,101**	**270,749**	**(114,352)**	**70.3%**

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

5.4 Projection of Economic Demand for Selected Health Workforce in Kenya

Leveraging on the econometric model by Liu et al[55] for estimating economic demand for health workers, the demand analysis at macroeconomic level showed that gross domestic product has a positive influence on demand for health care workers. Table 22 summarise the results coefficients (elasticities) obtained for the demand analysis for doctors, nurses, clinical officers and pharmacists and pharmaceutical technologists.

Table 22: Effect of GDP on demand for health care workers

Variables and Coefficients	Health Occupational Group			
	Doctors	Clinical Officers	Nurses	Pharmacist and Technologist
Constant/Intercept	-13.0373	-26.0081	-11.3461	-23.2028
Log of Out-of-Pocket Health Expenditure	0.0477	0.7794	0.0801	0.3200
95% Lower Bound	-0.1992	-0.0005	-0.3404	-0.3762
95% Upper Bound	0.2946	1.5592	0.5005	1.0162
Log of Per Capita Health Expenditure _lagged by 3 years	1.5515	3.0895	1.5819	2.8390
95% Lower Bound	1.3391	2.3773	1.1979	2.2031
95% Upper Bound	1.7638	3.8017	1.9658	3.4748
Summary of Model Fitness	Adj. R2 = 0.971156 P<0.001	Adj. R2= 0.939754 P<0.001	Adj. R2 = 0.917898 P = 0.000001	Adj. R2 = 0.933809 P = 0.000001

The elasticities of per capita income of more than one, indicating that demand each for increases more proportionate than per capita income. For instance, 10 percent increase in per capita income, lagged three years, would result in 15.5 percent rise in the demand for doctors. Additionally, these results show out-of-pocket expenditure (OOP), though important, has very small elasticities. In the case of nurses, a 10 percent increase in OOP, would increase demand by 0.8 percent. In summary, increase in GDP and its per capita is good for the health sector since the demand for health care workers increases sharply. This analysis should, however, be interpreted in terms of the overall "direction of evidence" of the economic demand versus supply and need, rather a demonstration of 'exact science' or economic derivations of the number of doctors economically demanded in Kenya.

As illustrated in Figure 24, the demand for doctors in 2020 seemed much higher than the supply but less than the need. Thus, there was both demand-based on need-based shortage of doctors in Kenya. However, it is unclear; and unlikely to be that there would have been sufficient fiscal

55 J X Liu and others, 'Global Health Workforce Labor Market Projections for 2030', Human Resources for Health, 15.1 (2017) <https://doi.org/10.1186/s12960-017-0187-2>.

room to employ all doctors if the level of supply had reached the levels estimated as the need. Therefore, sustained policy advocacy for investment decisions is required to translate the needs into effective demand (and fiscal space), which would, in turn stimulate supply of doctors to address the growing complexity of disease burden and population demographics.

Clinical officers appeared to be suffering higher than the supply and even the need. This seems to be the spillover effects from the undersupply of doctors to meet demand for doctors, which the clinical officers are potentially filling in the gaps. However, unemployment, underemployment, and precarious employment among clinical is reportedly on the rise, which suggest that potential macroeconomic demand is not effectively being translated into jobs or funded positions to clear the supply of clinical officers. In contrast, for pharmacist and pharmacy technologists, their demand seemed to completely outweigh that of their supply and even the need. This is partly driven by a booming manufacturing and retail pharmaceutical industry in Kenya that crowds out the public sector's opportunities to employ these cadres. For instance, findings of a County Assembly report carried in the news suggested that in the Nakuru county, "… in nearly all facilities there were no pharmacists or pharmaceutical technologists manning the pharmacies or the drug stores [which the roles were being filled by nurses]"[56]. Furthermore, the analysis suggests that the demand for nurses in 2021, was less than the supply but also below the need. Thus, some level of unemployment as anticipated as a result of the limited demand. Thus, whilst need-based shortage of nurses was apparent, demand related surplus of nurses was also evident. In part, this was attributed to a contraction of the private health sector (see the section on macroeconomics), a net employment freeze of the public sector. For the public sector, one additional challenge related to the translation of needs into effective demand or funded positions and recruitment is the bureaucratic civil service processes for creating new posts and/or recruiting to fill existing and funded post. These are illustrated in Figures 25 and 26, respectively.

56 Nation News Paper, 'Report Reveals Poor State of Some Nakuru Dispensaries', Nation, 2020 <https://nation.africa/kenya/counties/nakuru/report-reveals-poor-state-of-some-nakuru-dispensaries-218432> [accessed 11 May 2022].

Figure 24: Aggregate Economic Demand compared with, Supply and Need – Doctors, Nurses/Midwives, Clinical Officers and Pharmacists

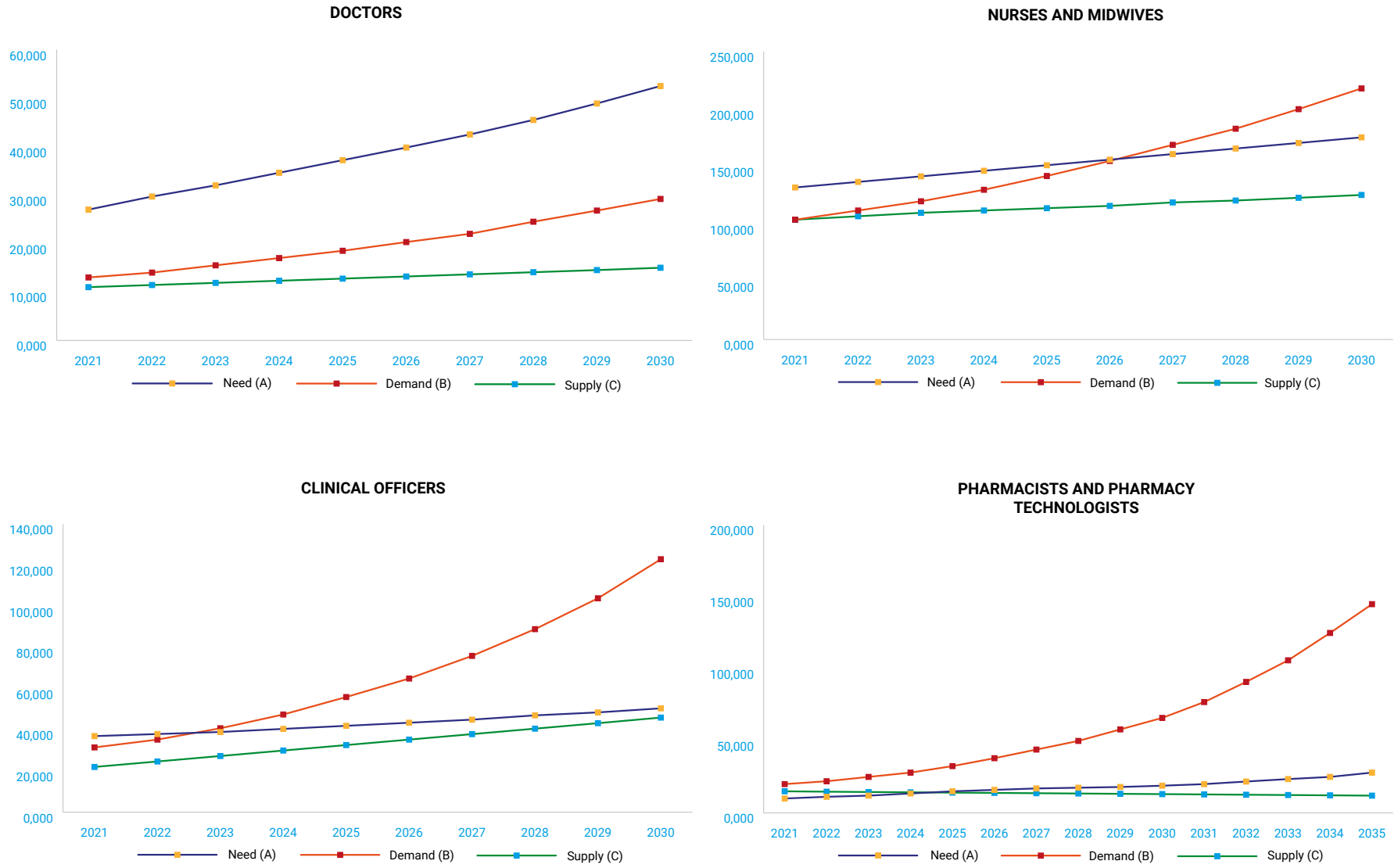


Figure 25: Creating a vacancy for public sector recruitment

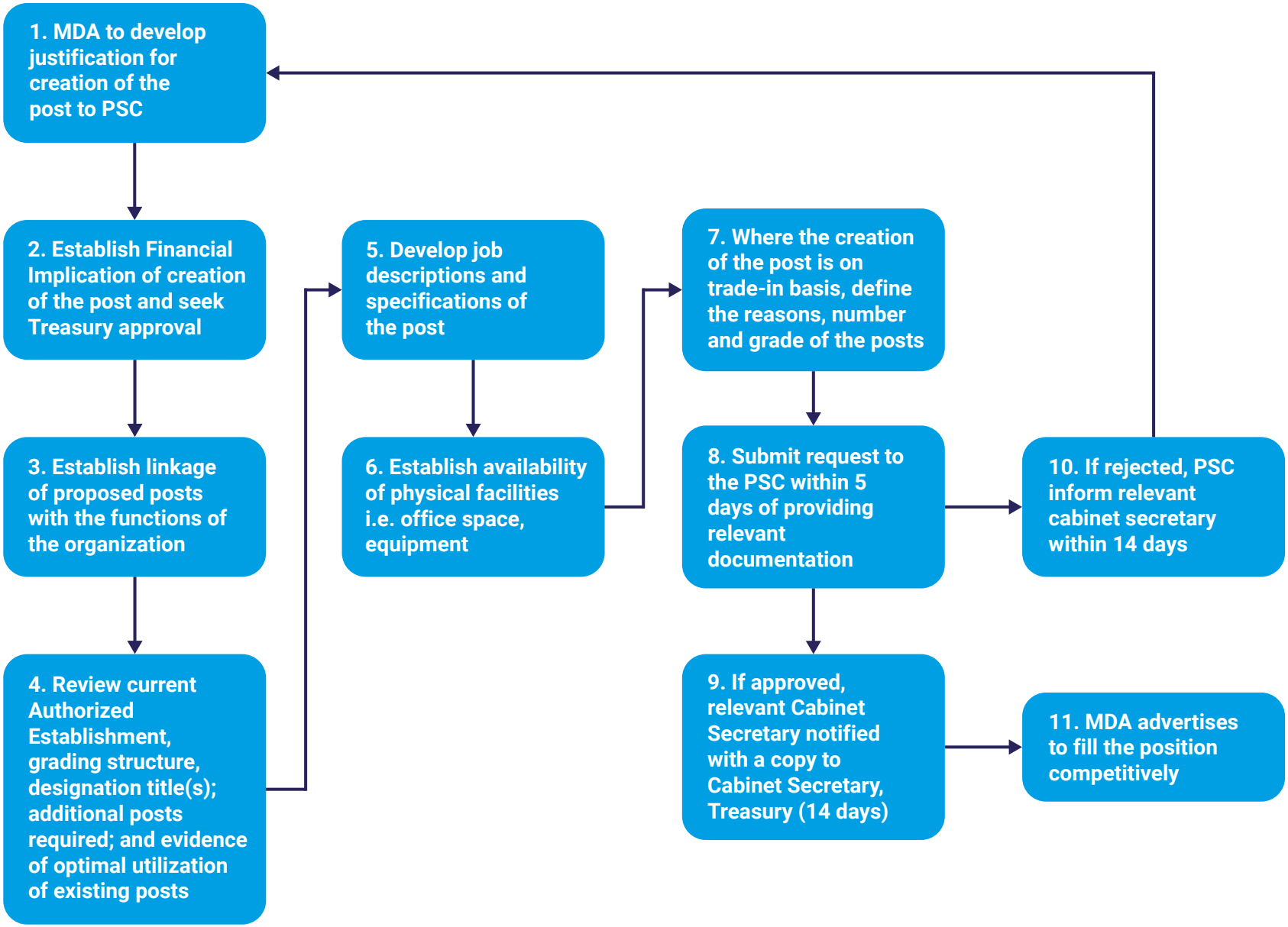
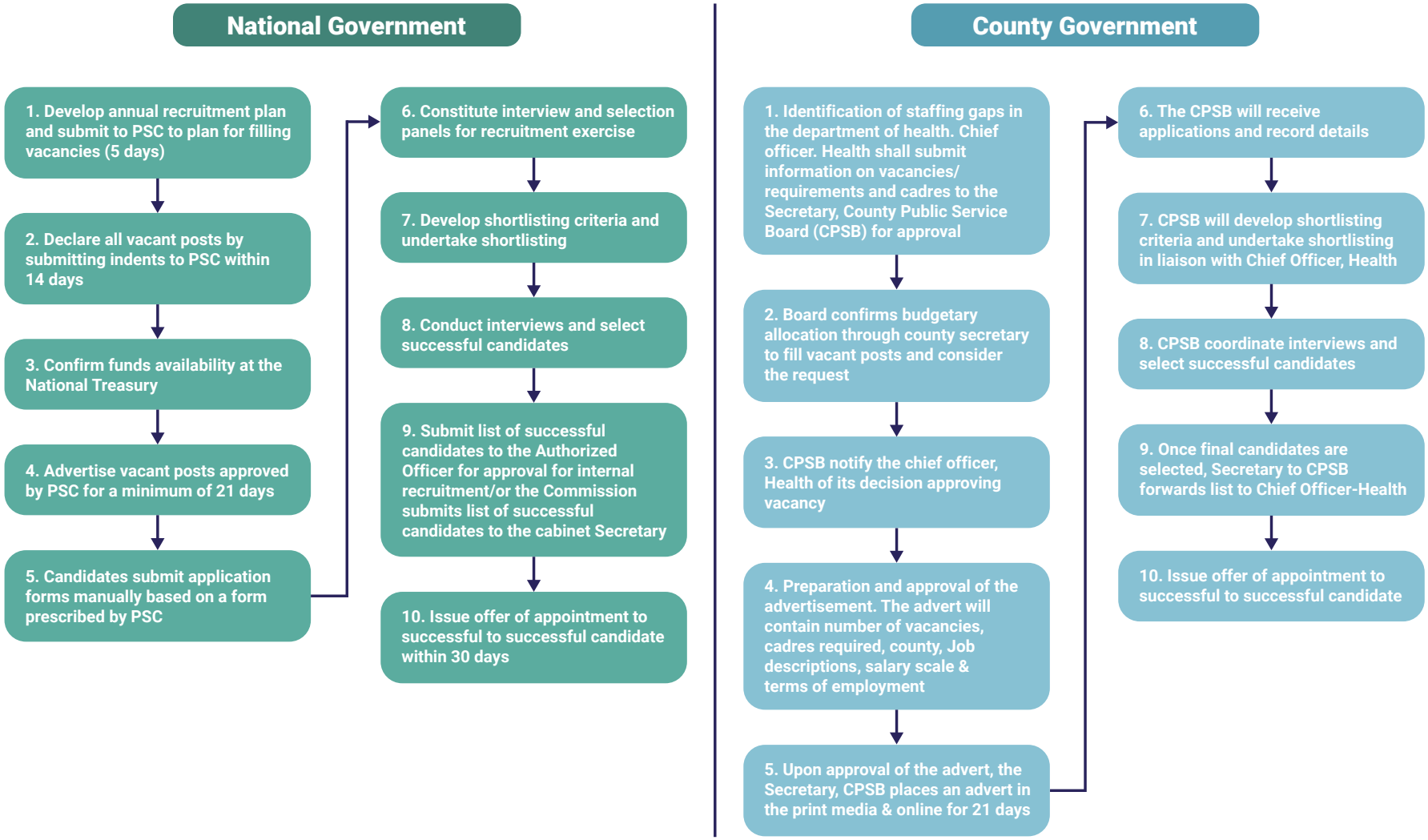


Figure 26: Process for filling a vacancy for public sector health workers



5.5 Health Workforce Financing and Economic Feasibility Analysis of the Labour Market

This section highlights a simulation of the potential affordability and sustainability of employing all the health workers and maintaining the jobs of those already employed. Two scenarios are presented – (a) the current and anticipated wage bill using the projected supply of health workforce and (b) the anticipated wage bill if employment is to be based on the projected needs. Using a conservative cost estimation approach from the perspective of public sector, the anticipated supply and need for the various categories of health workers were multiplied by their average salary levels to obtain the respective costs of supply and need. The estimated wage bill is compared with the most conservative or status quo projection (assuming that the level of health workforce prioritisation will remain the same) of the fiscal and financial space for the health workforce.

The public sector across national and county governments potentially had US$1.4 billion for health workforce employment in 2021 (overall wage bill). This budget space is anticipated to expand marginally to US$1.7 billion by 2025. If there is no further prioritisation of health spending and that of the health workforce, it is estimated that improvements in the overall economic environment would drive further expansion in the public sector budget space up to US$2.2 billion by 2030. Additionally, the private sector, which is a key driver of health employment in Kenya contributed approximately US$877 million in 2021, which if the country's economic growth potential is realised, could expand to US$1.06 billion by 2025 and US$1.37 billion by 2030.

Cumulatively, the potential financial space for health workforce, which is a combination of the public sector and the private sector contributions was estimated to be US$2.29 billion in 2021. The financial space is anticipated to increase by 21% to US$2.77 billion in 2025 and could be further boosted by 29.2% to US$3.58 billion by 2030, if the macroeconomic outlook remains favourable and the policy environment continue to prioritise health in public spending within which the health workforce receives not less that the prevailing proportional share of the current health expenditure.

On the supply side, it is estimated that the wage bill for employing all stock of health workers in 2021 (at government salary levels) was roughly US$2.85 billion. Given an unmitigated supply pipeline based on the prevailing trends, the cost of absorbing all those to be employed from the training pipeline in addition to maintaining the job of those already employed is projected to reach US$3.34 billion in 2025 and up to US$3.9 billion by 2030. Thus, employing all the trained heath workers (whether in the public or private sectors) requires an additional 24.6% financial space (from both public and private sectors) or the equivalent of 55% of the public sector wage bill. This, financial gap for health workforce employment, if not addressed could translate into unemployment of skilled health workers, which was estimated to be 14% in 2021. The 2021 wage bill was approximately 2.62% of GDP (across public and private sectors), but if all unemployed health workers were to be absorbed, it would have been 3.26% of GDP in 2021. Thus, at least

additional 0.71% of GDP investment is needed to absorb the unemployed health workforce and those in the production pipeline.

Assuming that training would be expanded for the supply of health workers (of various cadres) to meet all the projected needs, the need-based requirements would have costed some US$4.17 billion in 2021 in terms of employment and maintenance of the wage bill. This would have been equivalent to 4.77%. Against a backdrop of expanding health needs, the health workforce cost of filling the needs could increase 4.6% to reach $4.99 billion in 2025 and up to $6.26 billion by 2030. Filling the need-based requirements for health workers represents an average of 4.69% of GDP (range: 4.58 – 4.83%) between 2021 and 2036 in terms of new employment and maintenance of the wage bill across the public and private sectors.

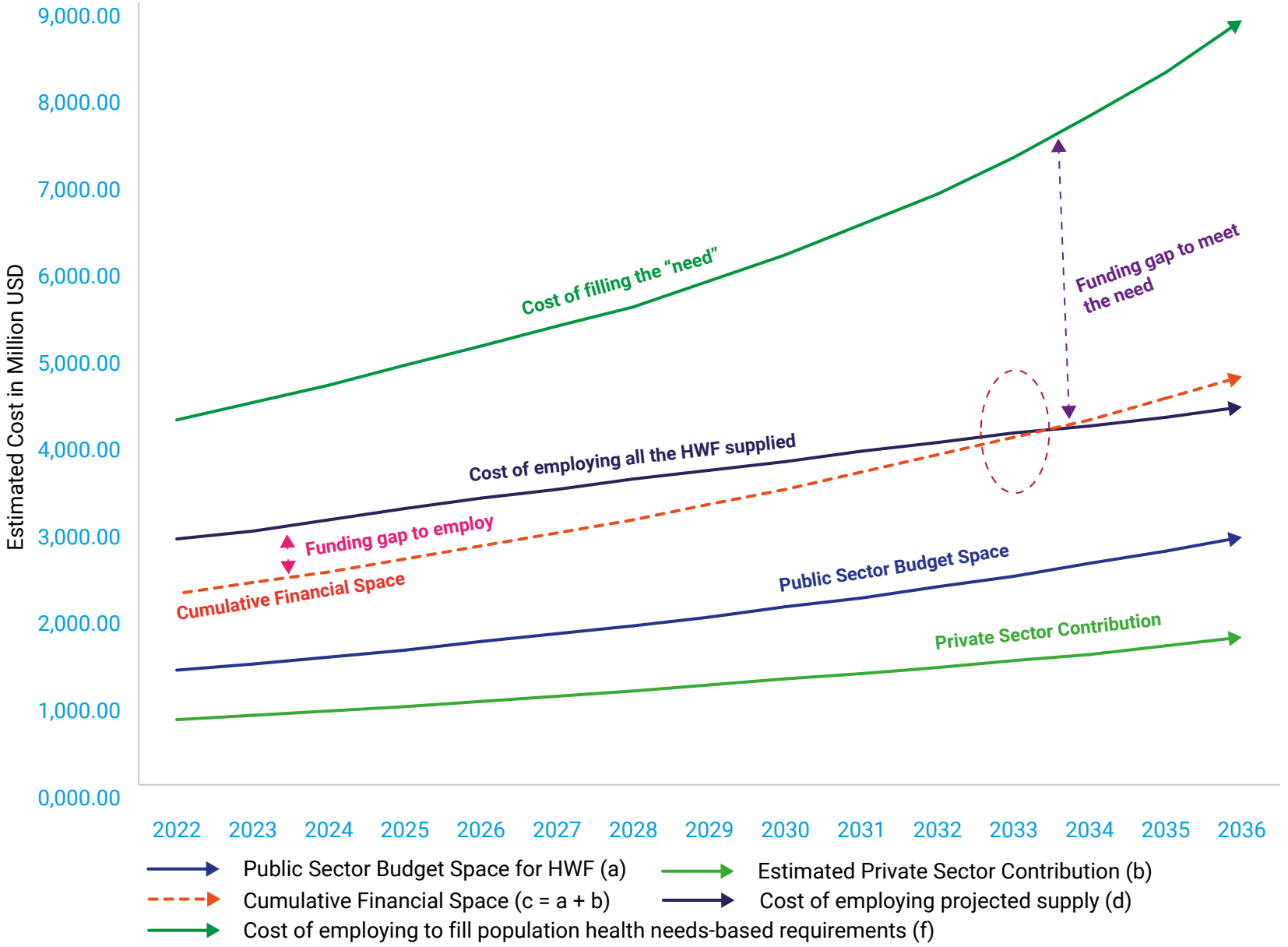
Additionally, the cost of training to fill the need-based gaps (which is shared between Government and individuals) is about US$761.13 million (ranging from US$510.6 million – US$1.02 billion) or 0.4% of GDP (range: 0.03% - 0.64%). The health workforce needs, thus, require an additional investment equivalent to 2.3% of GDP. Table 23 provides summary cost estimates and comparisons, which are graphically illustrated in Figure 27.

In summary, up to 2030, both the public sector's fiscal space and private sector's contribution for health workforce employment must be increased to absorb those being trained. The public and private sector must jointly increase investment in health workforce employment by not less than 6.5% per year (which could be as high as 25% in in some years). Also, if the public sector is to bear the entire investment required, the minimum additional budgetary allocation required at both national and county levels is 10.5% per year (and up to 40% in some cases). This estimate is based on the assumption that the private sector's capacity to absorb trained health worker will either improve or least not worse off than the currently observed levels.

Table 23:Estimates of Economic Feasibility of Supply and Needs compared with Potential Financial Space

ID	Cost implications and financial sustainability estimates	2021	2025	2030	Average	Minimum	Maximum
1	Public Sector Budget Space for HWF (a)	1,413.43	1,709.82	2,208.31	2,104.44	1,413.43	3,001.88
2	Estimated Private Sector Contribution (b)	877.01	1,060.92	1,370.23	1,305.78	877.01	1,862.63
3	Cumulative Financial Space (c = a + b)	2,290.44	2,770.74	3,578.54	3,410.22	2,290.44	4,864.50
1	Cost of employing projected supply (d)	2,853.00	3,339.53	3,902.61	3,718.55	2,853.00	4,517.57
3	Cost of employing to fill population health needs-based requirements (f)	4,173.57	4,991.89	6,255.87	6,101.19	4,173.57	8,975.88
4	Cost of training to fill population health needs-based gaps (g)	510.60	644.21	811.23	761.13	510.60	1,011.66
1	Overall investment required based population health need (Needs-based Employment + Cost of Training), (f+g)	4,684.17	5,636.11	7,067.10	6,862.32	4,684.17	9,987.54
2	Proportion of supply-side wage bill that could be absorbed by the estimated financial space (d/c)	80.28%	82.97%	91.70%	90.5%	80.3%	107.7%
4	Proportion of population health need that could be covered by financial space (f/c)	54.88%	55.50%	57.20%	55.9%	54.2%	57.2%
5	Percent of financial space required to absorb “unemployed” health workers	24.56%	20.53%	9.06%	15.13%	1.10%	24.56%
6	Percent of public health sector wage required to absorb “unemployed” health workers	39.80%	33.27%	14.67%	24.51%	1.78%	39.80%
1	Current HWF expenditure as % of GDP	2.62%	2.62%	2.62%	2.62%	2.62%	2.62%
2	Cost of supply as % of GDP	3.26%	3.16%	2.86%	2.92%	2.43%	3.26%
3	Cost of population health need as % of GDP	4.77%	4.72%	4.58%	4.69%	4.58%	4.83%
4	Additional cost of need as % of GDP	2.15%	2.10%	1.96%	2.07%	1.96%	2.21%
5	Additional cost of supply as % of GDP	0.64%	0.54%	0.24%	0.40%	0.03%	0.64%

Figure 27: Economic feasibility analysis under different projection scenarios



5.6 Illustrative Return on Investment Analysis: Making an Investment Case for the Health Workforce in Kenya

5.6.1 Overview of the global evidence on returns on investing in the health workforce

As part of the global sustainable growth and development agenda, the United Nations member countries including Kenya in 2015 adopted the Sustainable Development Goals (SDGs) of which Goal 3 with its 13 targets aims at healthy lives and the well-being of people at all ages, including Universal Health Coverage (UHC). The attainment of UHC towards the SDGs requires responsive and resilient health systems underpinned by adequate, motivated and equitably distributed health workforce. The contribution of the health workforce transcends only contributing to the attainment of SDG 3 and UHC. There is a clear nexus between health workforce investment and other SDGs such as goals 4 (quality education), 5 (gender equality), and 8 (decent work and economic growth) among others.

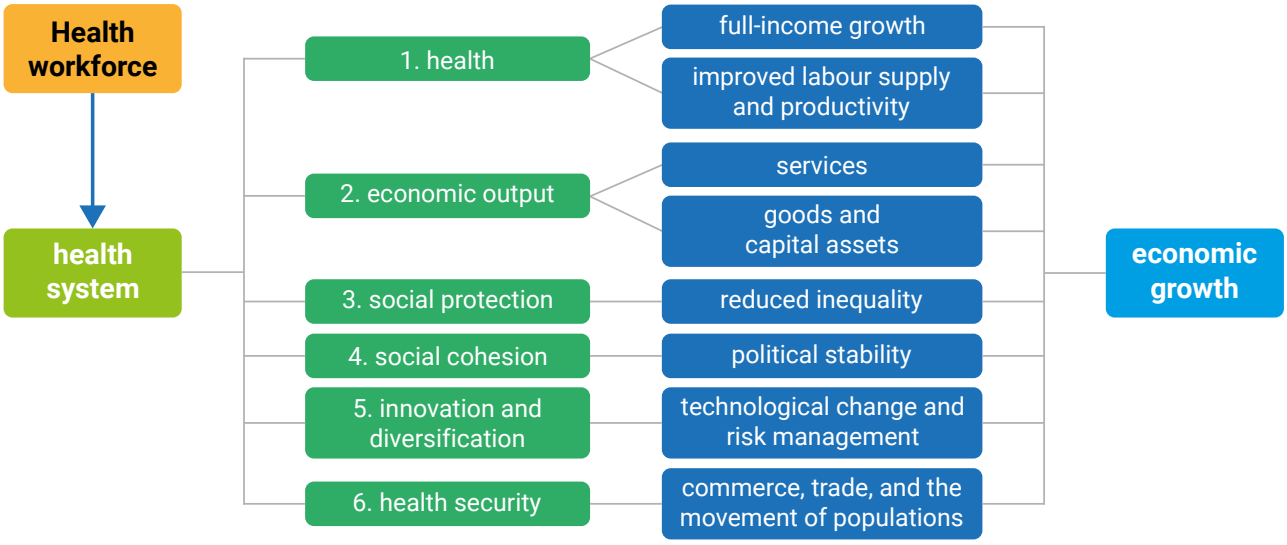
Unfortunately, health workforce expenditure has previously been considered a cost that needs to be contained to free up resources for investment in areas that have been traditionally considered productive sectors. However, recent evidence has shown that the health workforce is an important multiplier of economic growth through six main causal pathways (see Figure 28). These are (a) the health pathway - the intrinsic (non-market-valued) health benefits of the health system; (b) the economic output pathway which concerns the intrinsic (market-valued) economic benefits of the health system; (c) the social protection pathway, addressing sickness, disability, unemployment and old-age benefits, as well as financial protection against loss of income and catastrophic health payments; (d) the social cohesion pathway, addressing the role of a health system in promoting equity and fostering redistribution and growth; (e) the innovation and diversification pathway, addressing the role of the health system in driving technological development and in offering protection against macroeconomic shocks; and (f) the health security pathway, addressing the role of the health system in protecting against epidemic outbreaks and potential pandemics[57].

Furthermore, the report of the UN High Commission on Health Employment and Economic Growth (HEEG) demonstrated that investing in the health workforce yielded a nine (9) fold **return on investment** WHO, 'Working for Health and Growth: Investing in the Health Workforce', 2016. Thus, for every dollar invested in creating decent employment for health workers, the potential return is about nine dollars. It also demonstrated that half of the global economic growth over the last decade resulted from improvements in health, noting that for every added year of life expectancy, the economic growth rate is boosted by 4%. In the specific context of some middle-income countries, analysis in Namibia revealed that for every unit increase in essential health workers per 1,000 population, there is a corresponding improvement in overall life expectancy

57 J. Lauer and others, 'Pathways: The Health System, Health Employment, and Economic Growth', In Health Employment and Economic Growth: An Evidence Base. Geneva: World Health Organization, 174 (2017).

at birth by 2.78 which in turn accelerates growth rate of the national economy by 1.67% for every year of life expectancy added[58]. Similar findings have been reported in Vietnam[59].

Figure 28: Health pathway to economic growth



Source: *Adapted from Lauer et al, 2017*

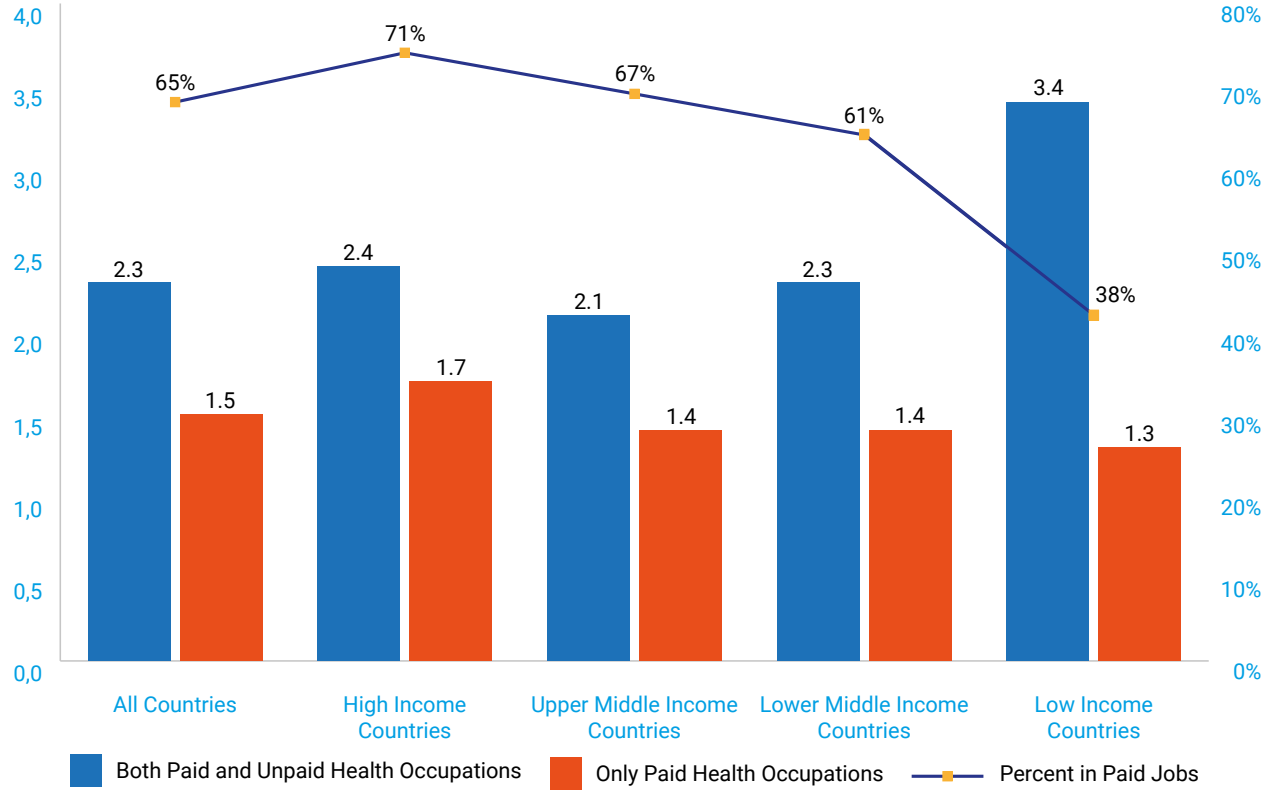
Furthermore, analysis of the contribution of the health workforce (health occupations) on employment within the wider health economy, based on data from the International Labour Organization (ILO) revealed that, across all countries, the employment of one health professional is linked to the creation of 2 to 3 jobs for workers in the non-health occupations (NHO) both within and beyond the health sector (Figure 29). Even if only paid NHO work is considered, employment of health professionals results in 2-3 folds jobs which at least 61-71% will be paid jobs in the context of middle-income countries such as Kenya. Thus, a direct effect of additional health professionals' jobs is the generation of NHO employment, from which the resultant incomes are used and reused to contribute to the broader economy, leading to further employment and economic growth[60].

58 MOHSS, Human Resources for Health Situation Analysis - Health Labour Market Approach (Windhoek, Namibia: Ministry of Health and Social Services, 2019).

59 Mai Phuong Nguyen, Tolib Mirzoev, and Thi Minh Le, 'Contribution of Health Workforce to Health Outcomes: Empirical Evidence from Vietnam', Human Resources for Health, 14.1 (2016), 68 <https://doi.org/10.1186/s12960-016-0165-0>.

60 Xenia Scheil-Adlung, 'Health Workforce Benchmarks for Universal Health Coverage and Sustainable Development', Bulletin of the World Health Organization, 91.11 (2013), 888–888 <http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S0042-96862013001100888> [accessed 24 October 2016].

Figure 29: Ratio of Non-Health Occupation (NHO) workers to Health Occupation (HO) workers, by income group, 2015

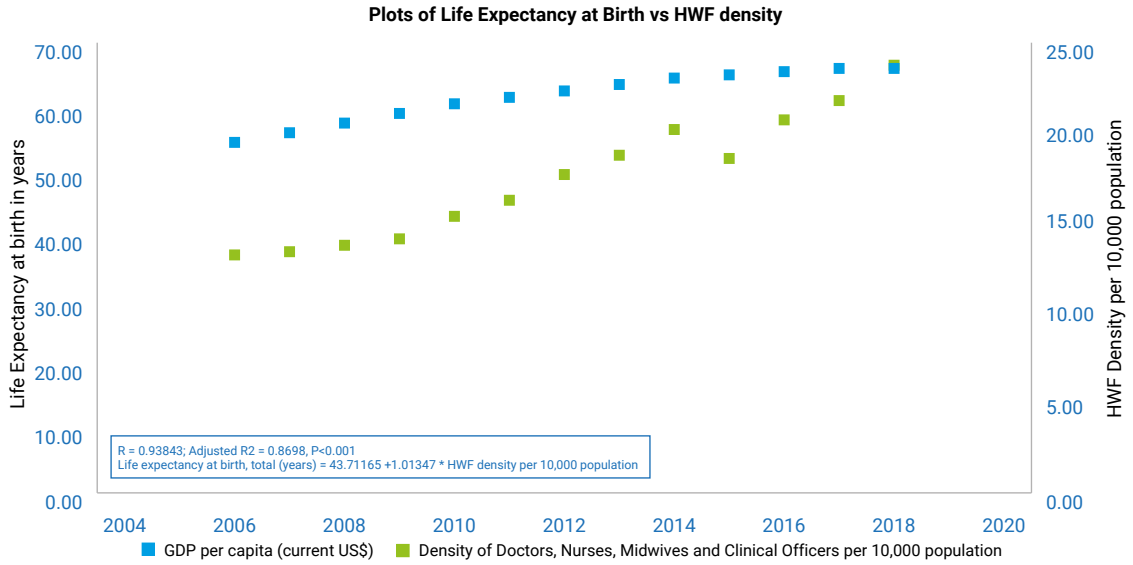


Source: *Adapted from ILO calculations, 2016*

5.6.2 Preliminary analysis of the correlation between health workforce density and selected indicators in Kenya

Owing to data limitations, sophisticated impact modelling was not feasible. Therefore, simple corrections and single variable models were used to explore between health workforce density and selected variables. The preliminary results as shown in Figures 20 and 31 largely reinforces the known global evidence that investing in the health workforce provides a significant return on investment. In Kenya's context, increasing employed health workforce density by one unit per 10,000 population (i.e., by approximately 5,377 per annum) is correlated with at least one year of added life expectancy to Kenyans (see Figure 30), which in turn has a great impact on GDP per capita.

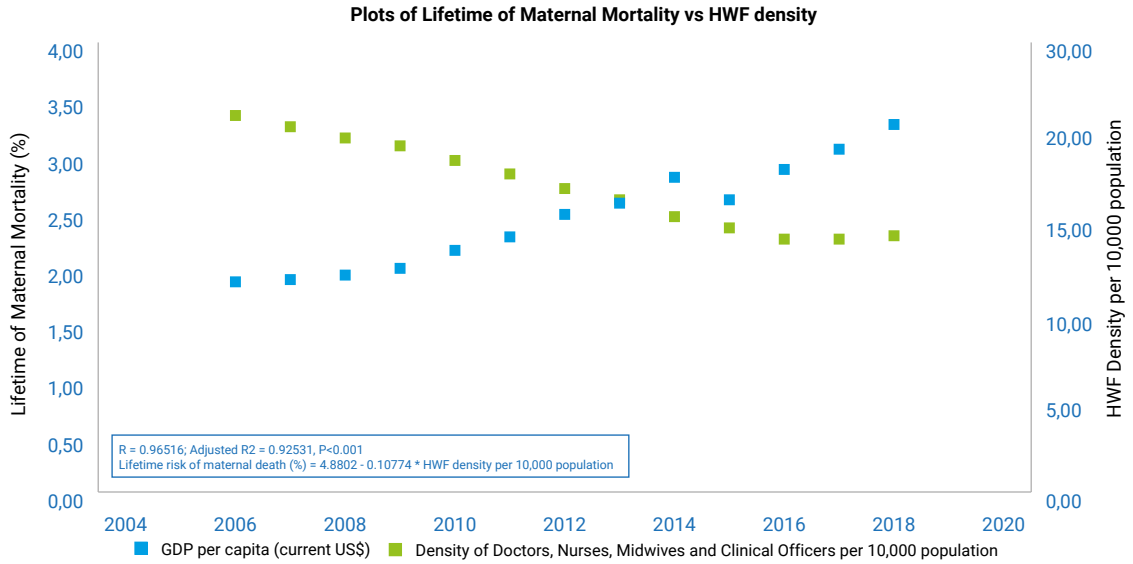
Figure 30: Scatter Plot Showing the relationship between Health Workforce Per 10,000 Population and Life Expectancy at Birth in Kenya



Source: *Analysed from World Development Indicators, World Bank (2021)*

Also, the analysis shows a negative and statistically significant relationship between health workforce density and the lifetime risk of maternal death in Kenya. Every unit increase in the health workforce density is correlated with 0.10% reduction in the women's lifetime risk of dying from pregnancy and childbirth (see Figure 31). This analysis should, however, be interpreted with caution as the time series was only 13 years and single predictor variable models were assumed, but in reality, several variables moderate or mediate or even confound these relationships.

Figure 31: Scatter Plot Showing the relationship between Health Workforce Per 10,000 Population and Lifetime risk of maternal death in Kenya



5.7 Key Limitations

The main limitation of this analysis relates to data and methodological assumptions. There were significant challenges with respect to the scope, accuracy and validity of the health workforce data. Some data collected attracted close scrutiny and had to be matched with data from other sources to ensure consistency. Some datasets also had incomplete information.

In addition, it is inherently assumed that as the economy expands, the government will, all things being equal, increase its investment in health and for that matter HWF. However, the level of investment in health may not entirely depend on economic growth but also political priorities.

A seeming role substitution is becoming apparent between specialist clinical officers and doctors, and between clinical officers and nurses. This made is it tricky to determine at the primary and secondary level of care, activities or interventions that are solely carried out by doctors and/or clinical officers. There will, thus, be some degree of overlap between the estimated need-based requirement for doctors and clinical officers.

Finally, this analysis was solely based secondary data and desk review of reports and literature and complemented by stakeholder discussion. Thus, the analysis is inherently descriptive with modelling, with, limited inferential statistical analysis was possible. Primary data collection using staff and health facility surveys in selected counties would add deeper insights to some of the findings.

Section 6

6. EXPLORATORY HEALTH LABOUR MARKET ANALYSIS FROM CROSS SECTIONAL HEALTH WORKER SURVEY

6.1 Socio-Demographic Characteristics

6.1.1 Facility Characteristics

This section represents respondent's characteristics by health facility location, health facility ownership. The table 24 shows that the selected respondents were representative of the different facility ownership with public facilities representing over 60% of the respondents while the rest of the respondent were from FBO and Private facilities.

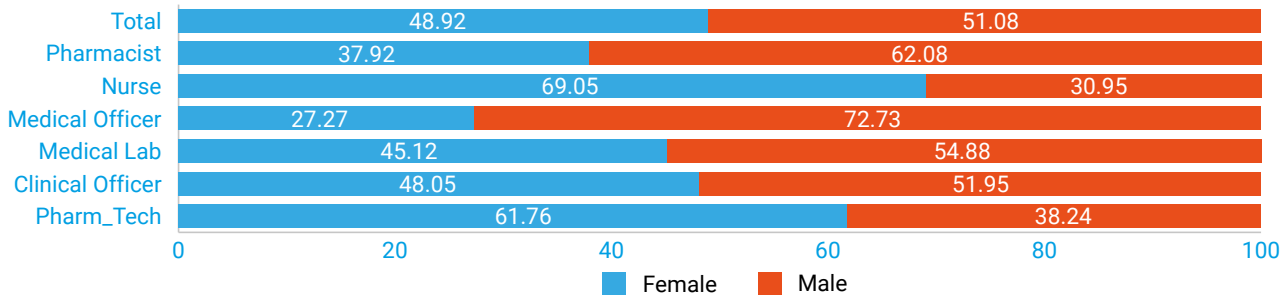
Table 24: Respondents by health facility location and Ownership

Location	Facility Ownership			Total
	FBO	Public	Private	
Rural (N=108)	26.85	70.37	2.78	29.03
Semi-Urban(N=96)	15.63	72.92	11.46	25.81
Urban(N=168)	11.31	48.21	40.48	45.16
Total (N=372)	**16.94**	**61.02**	**22.04**	**100**

6.1.2 Respondent Characteristics

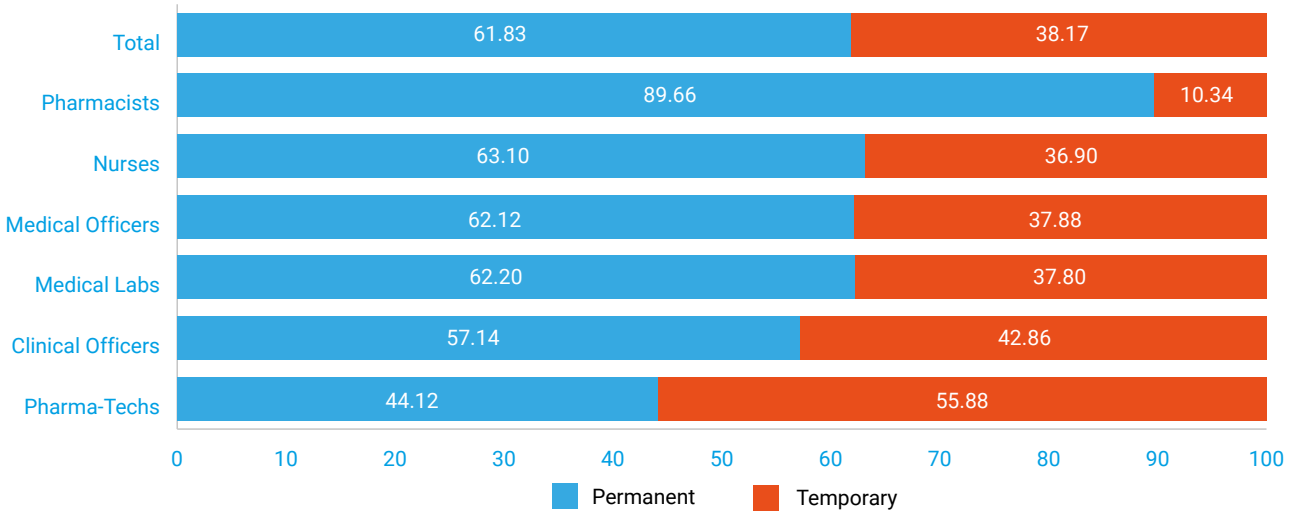
In terms of distribution of the respondents by gender, female accounted for 48.92% of total respondents while and male 51.08% (Figure 32). Apart from pharmaceutical technologists and nurses where females were dominant, the other cadres were dominated by males.

Figure 32: Distribution of respondants by Cadre and Gender



With regards to employment terms by cadre, in general 61.83% of the sampled health workers were on permanent contracts while 38.17% had temporary contracts. It is important to note the major divergence in terms of pharmaceutical cadres where over 89% of all pharmacists had permanent contracts compared to pharmaceutical technologists where only 44% had permanent contracts.

Figure 33: Employment status by cadre



Among the sampled health workers, only 16.4% had specialised beyond their core training required for one to qualify for the cadre. The highest number was among the pharmacists.

Figure 34: Percentage of specialist by cadre

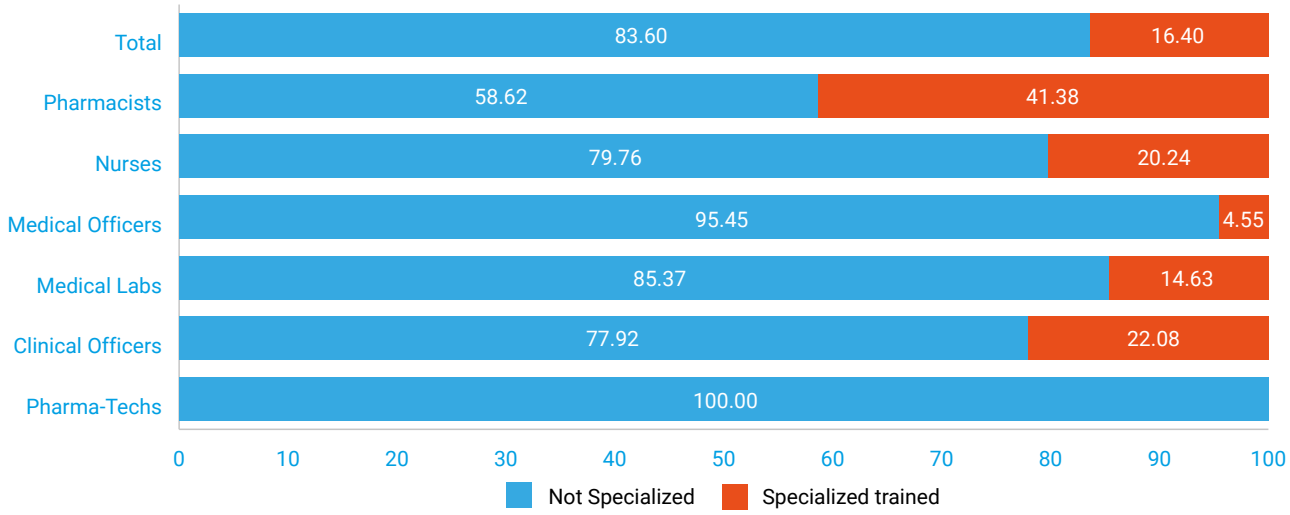
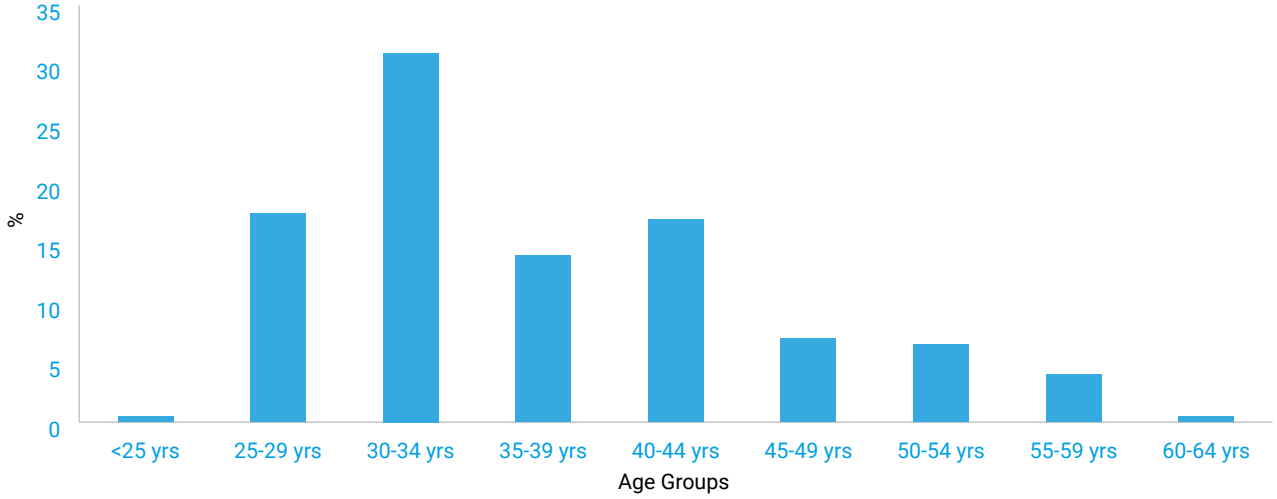


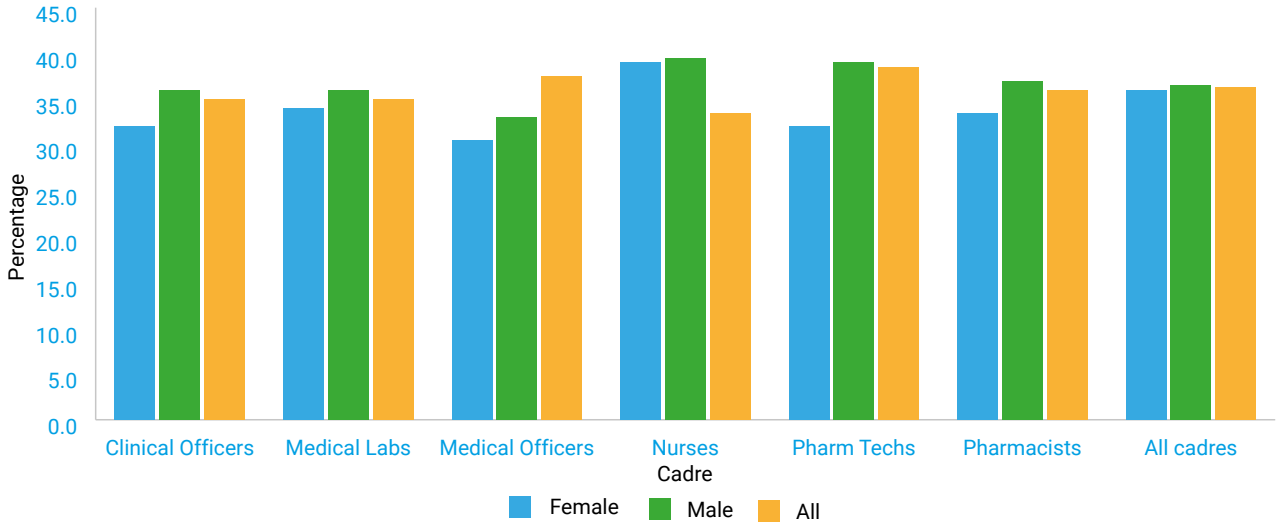
Figure 9 shows the distribution of the health workers sampled across age groups, the most dominant age group was 30-34 years with the least being those under 25 and above 60 years

Figure 35: Distribution of respondents across different age group



In terms of distribution of age across cadres, Medical Officers had the lowest median age at 31 and 33.5 years for females and males respectively. The highest median age was reported among the Nursing staff with 40 years for females and 40.5 years for the male Nursing staff.

Figure 36: Median age for different health worker cadres



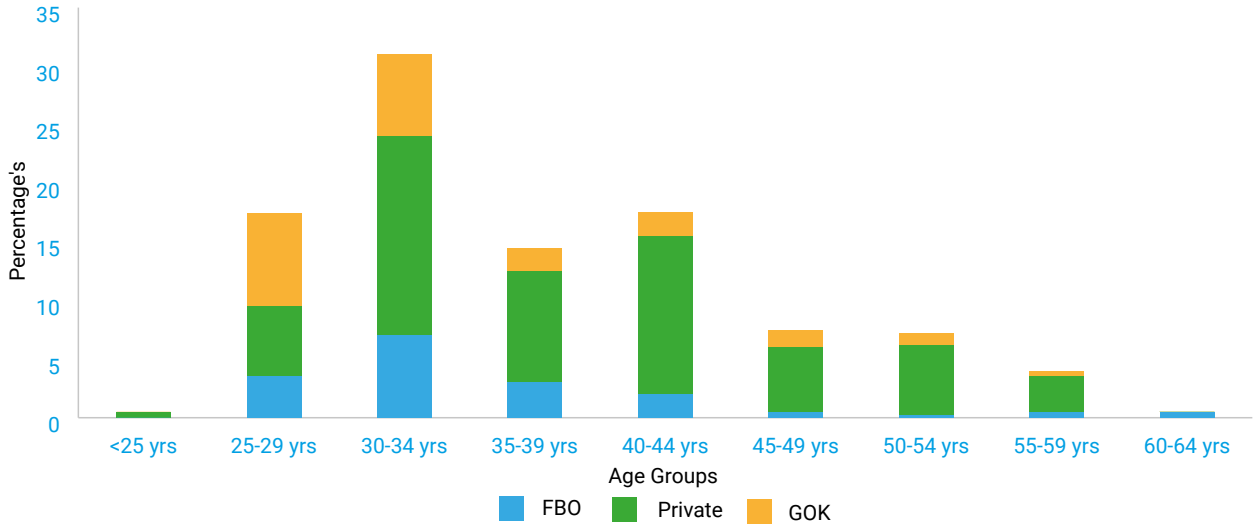


Table 4 shows the mean cumulative years worked for the health workers sampled. On average, Nurses had the highest mean cumulative years worked at 14.85 years with a range of 34 years, followed by Medical Laboratory technologists at 13.8 years with a range of 29 years in service. The least mean cumulative years of service was Medical Officers at 8.52 years with a range of 30 years in service.

Table 25:Average cumulative years of services by cadres

Cadre	Mean	Minimum	Maximum
Clinical Officer	10.66	1	31
Medical Laboratory Officer	13.28	2	31
Medical Officer	8.52	1	31
Nurses	14.85	1	35
Pharmacy Technologist	9.45	3	26
Pharmacist	10.57	5	18

6.2 Health Workforce Mobility Intentions

This section represents respondents' perception about future employment with the organization, perceptions about leaving the health facility, preference to continue working in the health facility, importance to continue working in the health facility and willingness to re-apply for the job at the current health facility.

6.2.1 Intentions to stay with the employer and health facility

In terms of health worker's perception about future employment with the organization, medical laboratory officers in the private sector and nurses in the faith-based facilities. The perception for

the different employers is summarised in Table 26. It is important to note that public in this case means the county government

Table 26: Perception about future employment with the organization (%)

Ownership	Cadre	Definitely leave	Probably leave	Probably not leave	Definitely not leave
FBO (20%)	Pharma Tech	29%	71%	0%	0%
	Clinical Officer	23%	62%	15%	0%
	Medical Laboratory	21%	50%	21%	7%
	Medical Officer	0%	33%	58%	8%
	Nurse	43%	43%	14%	0%
	pharmacist	0%	33%	33%	33%
Public (50%)	Pharma Tech	11%	42%	26%	21%
	Clinical Officer	2%	34%	40%	23%
	Medical Laboratory	6%	28%	30%	36%
	Medical Officer	15%	39%	24%	22%
	Nurse	6%	34%	26%	34%
	Pharmacist	4%	48%	13%	35%
Private (30%)	Pharma tech	12%	38%	37%	13%
	Clinical Officer	6%	65%	18%	12%
	Medical Laboratory	43%	43%	10%	5%
	Medical Officer	23%	46%	15%	15%
	Nurse	15%	70%	5%	10%
	Pharmacist	0%	33%	0%	67%

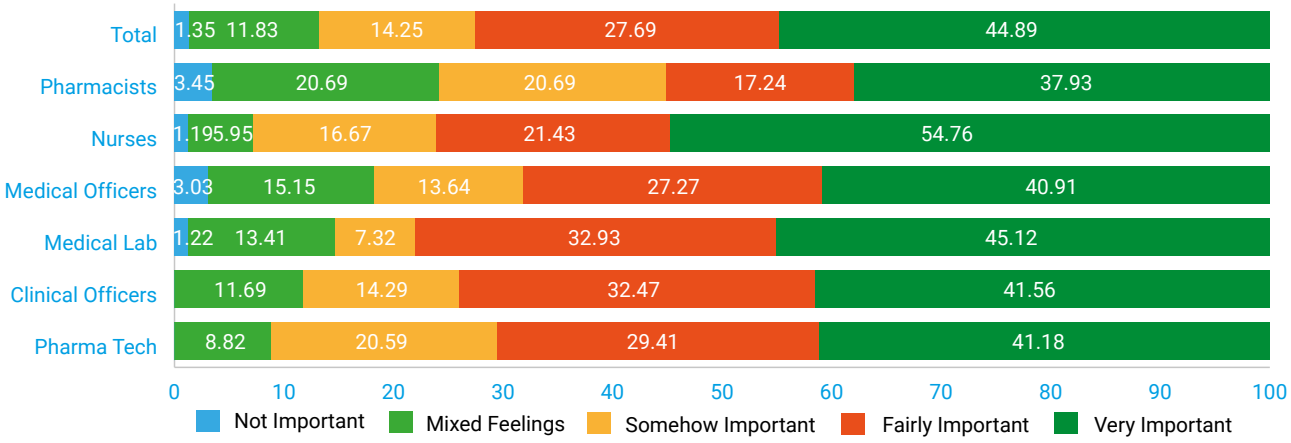
In terms of perceptions of leaving the specific health facility, the public owned facilities had the highest proportion of health workers that were unlikely to leave (Definitely not leave) while the health workers in the FBO and the Private all indicated a high preference for leaving. In general, more than 40% of the health works indicated that they would probably leave the health facilities at which they are currently working.

Table 27: Perceptions about leaving the health facility

Facility Ownership	Definitely leave	Probably leave	Probably not leave	Definitely not leave
FBO (n=90)	22%	49%	24%	5%
Public (n=250)	7%	36%	28%	29%
Private (n=160)	21%	54%	13%	12%
Aggregate % (N=500)	14%	44%	23%	19%

Health workers expressed various reasons why they preferred to continue working in their respective health facilities including social reasons such as proximity to family, retirement and having other income generating activities near their place of work. Some also found their facilities to have a good working environment and facilities that allowed them to practice their skills.

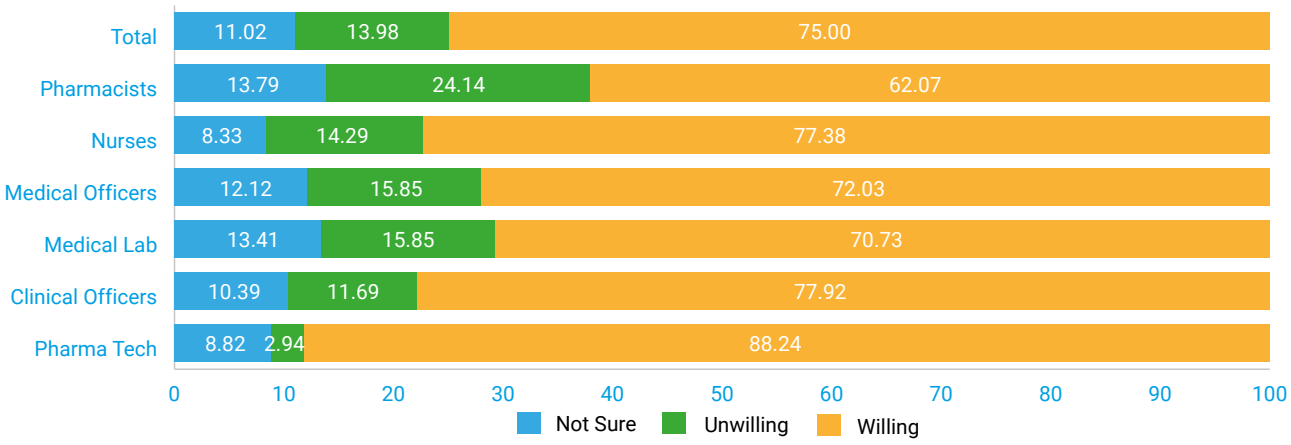
Figure 37: Importance to continue working in the health facility



The majority of the respondents noted that important to continue working at their current healthcare facility with nurses having the greatest proportion (54.76%). The other percentages ranged from 37.93 for the pharmacists to 45.12 by the medical Laboratory Officers. Only a small proportion of the respondents, Clinical Officers and Pharmaceutical Technologists (0%) — said it was not essential for them to keep on working at the healthcare facility.

Furthermore, more than 60%of the respondents from each cadre responded that they would be willing to re-apply for the job at the health facility with Pharmaceutical Technologists being the most willing at 88.24% followed by Clinical Officers at 77.92% and Nurses at 77.38%.

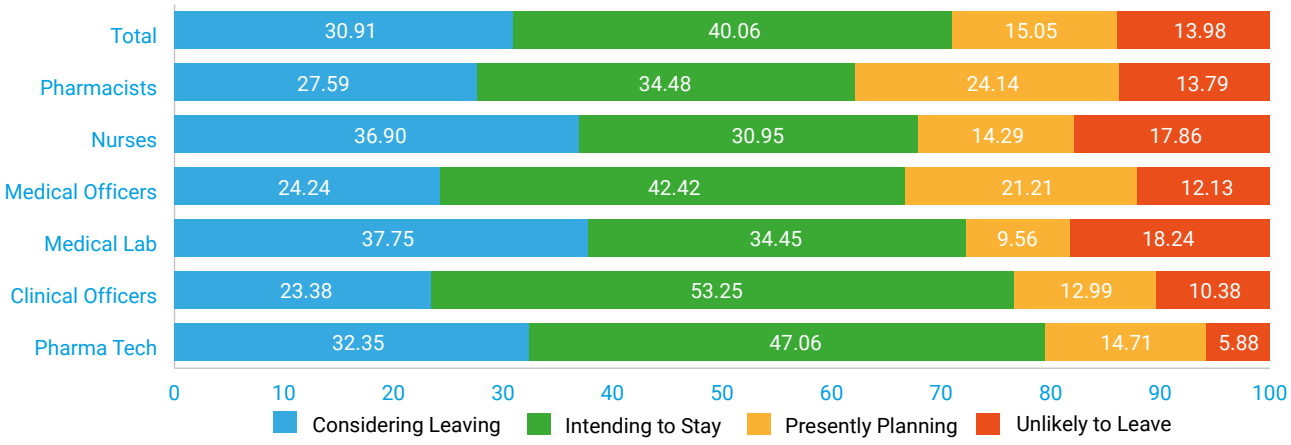
Figure 38: Willingness to re-apply for the job at the health facility as percentage



With regards to intentions to leave the current health facility, more than 30% of the respondents stated that they were considering leaving their current health facility while 40% indicated that they were intending to stay at the current health facility. The cadres who were highest in terms of considering leaving were medical laboratory technologists and nurses while clinical officers and pharmacist technologists had the highest intentions to stay. Motivations to leave the facility included delay in payment of salaries, political influence in management of health facilities and in search of better terms of service and job security. Opportunities for private practice and migration to other countries was also motivating factors to leave.

Those who were on temporary contract arrangements reported that they would wish to move if they found permanent and pensionable positions. In addition, staff welfare was also reported as a contributing factor to leaving a facility as were unfavourable working conditions such as working long hours and additional duties without compensation. These included some cases in which health workers reported working longer hours than required in the labour laws with no leave.

Figure 39: Feelings on leaving health facility by cadre (%)



6.2.2 Intentions to migrate within the country

This section represents respondents with intention to migrate to another county. Over half of the respondents in the survey reported intention to migrate from their current County of employment. The clinical officers were the highest proportion of the cadres willing to migrate at 70% while the pharmacists and pharmaceutical technologists were the least at 58%.

Figure 40: Intentions to migrate within the country

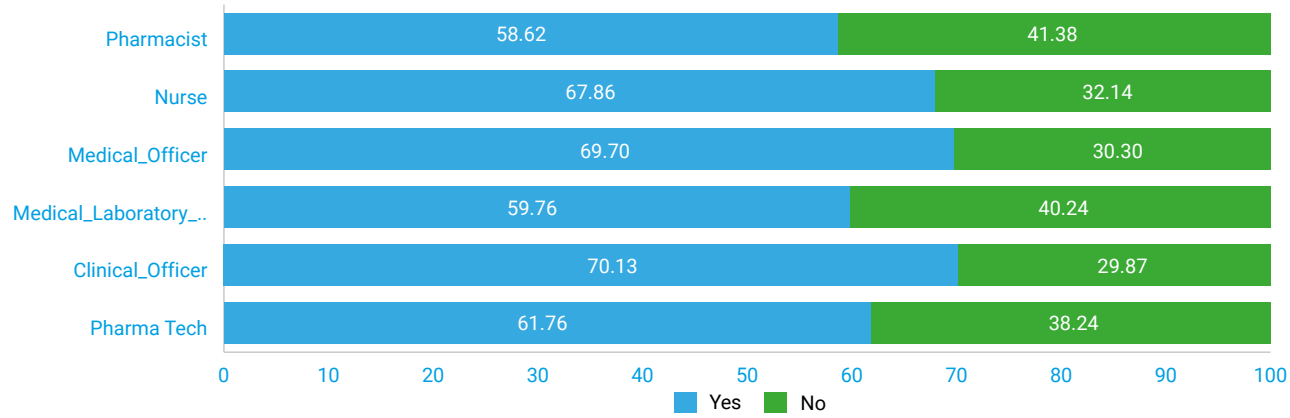
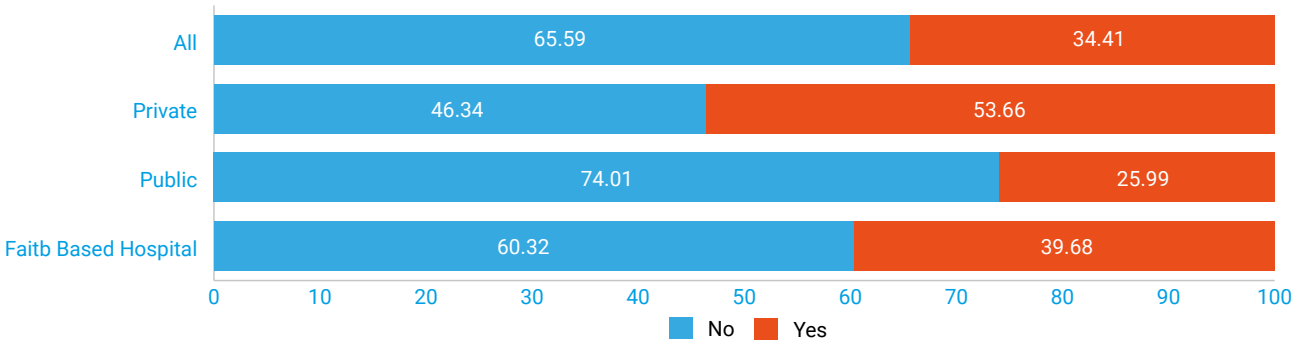


Table 28: Duration of intention to migrate from the county

Cadre	Proportion intending to migrate to another County	Started plan to migrate to another county	duration when intended to migrate to county					
			<6 months	6m-1yr	1yr-2yrs	3yrs-5yrs	6yrs-10yrs	Not sure
Pharma tech	20.59	28.57	0.00	14.29	14.29	0.00	14.29	57.14
Clinical officer	25.97	15.00	0.00	0.00	10.00	15.00	5.00	70.00
Medical laboratory	30	44.00	4.00	12.00	8.00	16.00	8.00	52.00
Medical officer	40.91	40.74	7.41	3.70	33.33	22.22	7.41	25.93
Nurse	41.67	20.00	0.00	2.86	3.00	31.43	2.86	31.43
Pharmacist	41.38	25.00	0.00	8.33	25.00	8.33	16.67	41.67
All	33.42	28.89	5.71	8.24	15.60	18.60	9.04	

With regards to intention to migration to another county by ownership of the facility, health workers in private health facilities and in faith-based facilities had a much higher preference to migrate to other counties.

Figure 41: Intention to migrate to another county by facility ownership (%)



Majority of the respondents who had started planning to migrate to another county were not sure on the duration they intended to migrate. Clinical officers were the highest proportion of the cadres not sure on the duration they intended to migrate at 70% while the medical officers were the least at 25%. Nairobi, Uasin Gishu and Nakuru were preferred destination for the health workers interviewed indicating a high preference for the urban areas.

There reasons for migrating to another county differed cadre type. For Medical Laboratory Officers and Clinical Officers, it was predominantly social reasons. The pharmacist and pharmaceutical technologist reported a change of employer as the main reason while for medical doctors it was speciality training. These are summarised in the Table 8.

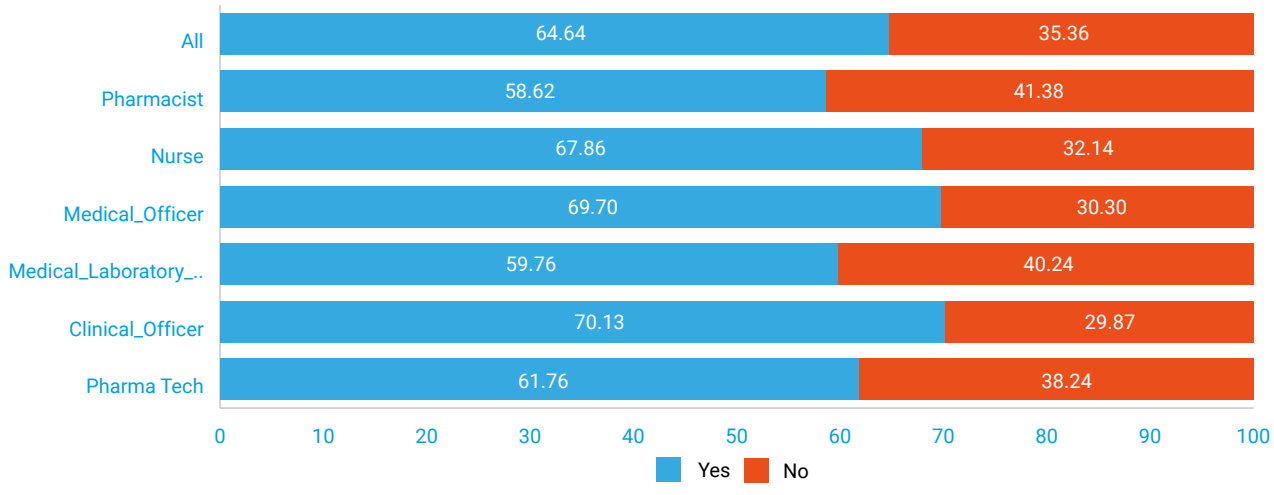
Table 8: Reasons for migrating to another county

Cadre	Change of employer	Change of profession	Other	Social reasons	Specialty training	Unfavourable working conditions
Pharma tech	23.1	0.0	7.7	46.2	23.1	0.0
Clinical officer	13.0	0.0	4.4	52.2	21.7	8.7
Medical laboratory	27.3	0.0	6.1	51.5	9.1	6.1
Medical officer	5.0	0.0	15.0	15.0	55.0	10.0
Nurse	11.1	3.7	7.4	33.3	22.2	22.2
Pharmacist	25.0	8.3	0.0	16.7	41.7	8.3

6.2.3 Intention to migrate to another country

This section indicates the intention to migrate to another country. In terms of countries of preference to migrate, the USA was preferred by the majority of respondents who intended to migrate abroad at 34.9%. Canada, the UK and Australia followed at 20.6%, 19.8 and 12.7% respectively.

Figure 42: Intention to migrate to another country by cadre



About 60% (include 64.4%) of the respondents in the survey reported intention to migrate from Kenya to other Countries. The pharmaceutical technologists were the highest proportion of the cadres willing to migrate to other Countries at 79% while the nurses and medical officers were the least willing to migrate at 58%.

Majority of the respondents who had started planning to migrate to another country were not sure on the duration they intended to migrate. Medical laboratory officers were the highest proportion of the cadres not sure on the duration they intended to migrate at 54.6% while the medical officers were the least at 30%.

Table 29: Duration of intention to migrate abroad

Cadre	Proportion intending to migrate Abroad	Started plan to migrate Abroad	Duration when intended to migrate					
			<6 months	6m-1yr	1yr-2yrs	3yrs-5yrs	Over 5yrs	Not sure
Pharma tech	38.24	23.08	15.38	0.00	15.38	23.08	7.69	38.46
clinical officer	29.87	30.43	13.04	0.00	21.74	13.04	17.39	34.78
medical laboratory	40.24	36.36	6.06	12.12	12.12	9.09	6.06	54.55
medical officer	30.30	40.00	5.00	15.00	20.00	15.00	15.00	30.00
nurse	32.14	11.11	18.52	18.52	11.11	14.81	3.70	33.33
pharmacist	41.38	33.33	8.33	16.67	25.00	16.67	0.00	33.33

In terms of the reasons for migration, most respondents reported seeking better terms of service and specialty training. The pharmacist reported the highest proportion of those seeking better terms of service at 66.7% and pharmaceutical technologist reported the highest proportion of those seeking specialty training at 71.4%. The pharmaceutical technologist reported social reasons as the other reason.

Table 30: Reasons for migrating to another country

Cadre	Change of profession	Other	Seeking better terms of service	Social reasons	Specialty training	Unfavourable working conditions
Pharma tech	0.0	0.0	14.3	14.3	71.4	0.0
Clinical officer	5.0	0.0	45.0	0.0	50.0	0.0
Medical laboratory	4.0	0.0	60.0	4.0	32.0	0.0
Medical officer	0.0	0.0	33.3	3.7	63.0	0.0
Nurse	0.0	0.0	62.9	0.0	34.3	2.9
Pharmacist	0.0	8.3	66.7	0.0	25.0	0.0
Total						**100**

6.3 Wage Expectations

This section introduces the concept of wages and wage expectation.

- Current income: This is refers to the wage received by the cadres for the current occupation within their profession.
- Reservation wage: This is the wage below which the cadres would not be willing to work within the same occupation. If the current earning is below the reservation wage for the occupation, the implication is that the cadres are relying on other sources to meet wage expectations from the occupation. The reservation wage is important for retaining people in professional practice but may also include the levels of dual practice within the sector.
- Transfer earnings: This is the wage that that would convince the cadre to move from their current job to another within the same occupation within the country. If a cadre is earning more than is required to keep them in the current position, then the difference between the current earning and transfer earnings is an economic rent. The transfer earnings are related to the cadres' intentions to change employer (including inter-county mobility) within the same country.
- Migration wage: This the wage that could convince the cadre to move from their current job to another job out of the country but within the same occupation. The migration wage is important in understanding the wage expectations if there is need to reverse the pattern of migration from Kenya to other countries.

6.3.1 Self-Reported Current Income of Health Workers

The current income varies across cadres. The internal wage relativity which indicates the variance between the better paid and least paid cadres showed that using the medical officer as the reference, the highest variance was for the pharmaceutical technologist who earned less than 25% of the income of the medical officer with the least variance observed with the pharmacists. However, it is important to note that there was variation between wages paid according to ownership.

Table 31: Current income per cadre

Cadre	MOH	FBO	PRIVATE	AVERAGE	Wage Relativity (Medical Officer as Reference)
Pharmaceutical technologist	96827	51714	60500	78451	0.36
Clinical Officer	96305	50385	66529	81790	0.38
Medical laboratory tech	87867	54514	47381	71606	0.33
Medical Officer	233373	174727	202364	217719	1.00
Nurse	103433	46714	41053	79586	0.37
Pharmacist	243010	131667	43333	210835	0.97

6.3.2 Reservation Wage versus Current Income

For all the 6 cadres considered, the reservation wage was on average 2% less than the current income implying that the cadres were currently earning almost their bare minimum that is required for them to keep within the profession. This means that if their salaries reduced by more than 2%, they would be willing to leave the occupation as that would be below their wage expectations. This pattern is mainly driven by nurses, clinical officers and medical laboratory technologists whose reservation wage was indicated to be lower than the current average income.

However, for pharmacists, medical officers and pharmaceutical technologists and their reservation wage was higher than the income they were earning from their current occupation. This means that for these cadres, they are having to do other jobs within and out of the profession so as to reach their reservation wage. For the medical doctor and pharmaceutical technologist, the variance is about 10% (i.e., they would need about 10% more of what they are currently earning in the current occupation to meet their reservation wage).

6.3.3 Transfer Income versus Current Income

The transfer income represent how much would be required to move to the next best source of income within the same occupation. On average, all the cadres considered would need on average about 47% more of their current earning at their current job to prevent them from moving to another job in the country within the same occupation. For Nurses, Clinical Officers and Pharmaceutical technologists, the amount desired to move from their current job to another job within the country is more than 50%.

6.3.4 Migration Wage versus Current Income

The migration wage represents a transfer earning (as above) but out of the country. For the cadres included in the sample, the average migration wage was 80% of their current earnings. This means that if there was a need to reverse an immigration pattern for cadres employed within the Kenya's health sector, it would require to increase their current earnings by at least 80%. The nursing cadre who is currently most targeted for international mobility through migration would require an increase of about 83% if there was need to reverse the migration pattern based on matching wage expectations.

Table 32: Migration Wage vs Current Income

Cadre	Amount (KES)-Monthly				Amount (US$) ($1=KES 118)-Monthly				Difference		
	Current Income	Reservation Income	Transfer Income	Migration Income	Current Income	Reservation Income	Transfer Income	Migration Income	Reservation vs Current	Transfer versus Current	Migration versus Current
Medical laboratory tech	56037	54672	97499	332470	475	463	826	2818	-2%	44%	83%
Pharmacist	147455	148707	264479	559075	1250	1260	2241	4738	1%	44%	74%
Medical Officer	161316	176686	262205	578186	1367	1497	2222	4900	9%	33%	72%
Nurse	63016	60242	119626	371150	534	511	1014	3145	-5%	50%	83%
Clinical Officer	65155	56789	126654	299788	552	481	1073	2541	-15%	55%	78%
Pharmaceutical technologist	39358	43952	94550	293510	334	372	801	2487	10%	54%	87%
Overall	**76684**	**75358**	**141915**	**383551**	**650**	**639**	**1203**	**3250**	**-2%**	**47%**	**80%**

**Exchange rate for KES/USD based on average for 2022.*

Box 4: Summary of insights on wage and income expectations

The study reveals important insights into wages and wage expectations among health workers in Kenya. On average, the minimum wage at which health workers would exit the workforce aligns closely with current gross salaries, although some cadres earn below their reservation wage. These workers likely supplement their income through dual practice, which can adversely affect the country's progress towards Universal Health Coverage (UHC). Public facilities generally offer higher wages than private ones, prompting some healthcare workers to engage in dual practice to reach their reservation wage. Transfer earnings within the labor market average 50% of current income, while migration wages are about 80% of current income. These figures can inform retention strategies.

Furthermore, low-wage healthcare workers are open to relocation for higher-paying roles, even if unrelated to their field of study. Kenya faces a labor surplus in some healthcare cadres but still needs critical roles for quality service provision. Additionally, Kenya's wages are higher compared to neighboring countries in the East African region, impacting both inward and outward migration of health workers. Therefore, issues related to both migration and emigration need comprehensive consideration for effective healthcare workforce planning and policy in Kenya.

6.4 Self-Reported Productivity and Absenteeism

6.4.1 Productivity of health workforce

The self-reported productivity for the health worker was very good across all the cadres and the management concurred with the performance by the health care workers. Despite reportedly performing well, they noted that little has been done to motivate and improve the morale of staff. While there exists a reward system for top performers in a few facilities, others reported lack of a clear rewarding system for exemplary performance. Where a reward system existed, it included provision of bonus to reward performance and also extra allowances for those working beyond their allocated time.

In some facilities, it was noted that, poor infrastructure hampered staff performance. For instance, it was noted that the performance of laboratory staff was impacted by simple things as the signage of the laboratory rooms. There was also reported lack of well-equipped microbiology laboratories, affecting the performance of the laboratory staff in some counties.

A critical component of assessing and enforcing performance was presence of governance structures. In institutions which had had governance structures such as boards reported that these routinely assessed performance of the facilities against the strategic plan and annual work plan of the facility. This enabled the health facility manager to hold their staff accountable.

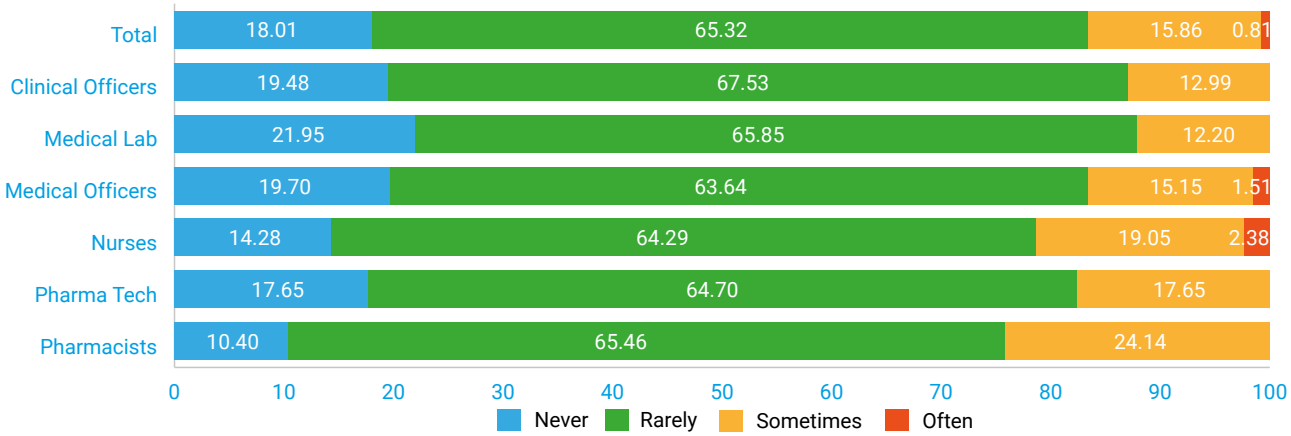
Regarding disciplinary action on health workers, disciplinary issues were handled by a disciplinary committee both at the health facility level, County Department of Health level and County Public Service Board level. Within the same context, the County Human Resource Advisory Committee was noted to make recommendations for the Chief Officer of Health to execute appropriately. However, it was reported that some disciplinary cases were never acted upon by the county.

In other situations, deployments made to some of the facilities did not match the capacity in terms of infrastructure and equipment required for the staff to provide the services. For instance, there cases of deployment without consideration for health worker specialization such as personnel with Higher National Diploma in haematology deployed to a dispensary. An additional example was given of laboratory personnel with degree qualifications being deployed to health-centres and dispensaries. This affected health worker productivity.

6.4.2 Self-reported absenteeism

In terms of self-reported absenteeism, the respondents reported that 65% of staff rarely missed scheduled duty. The pattern is similar across all the cadres. On the other hand, with only 18% of the cadres reporting to never have missed with the least likely to miss being medical laboratory technologist at 22% while among pharmacists only 10% reported to never have missed their scheduled duties.

Figure 43: Proportions of likelihood of workers missing their scheduled duties by cadre



6.5 Assessment of Job Quality

Precarious employment is a multi-dimensional construct including but not limited to employment insecurity, income inadequate, and lack of rights and protection in employment relations. These components form the job quality index. In this study, we estimated job quality as a composite of the following dimensions quality of earnings score, labour market quality score and quality of working environment.

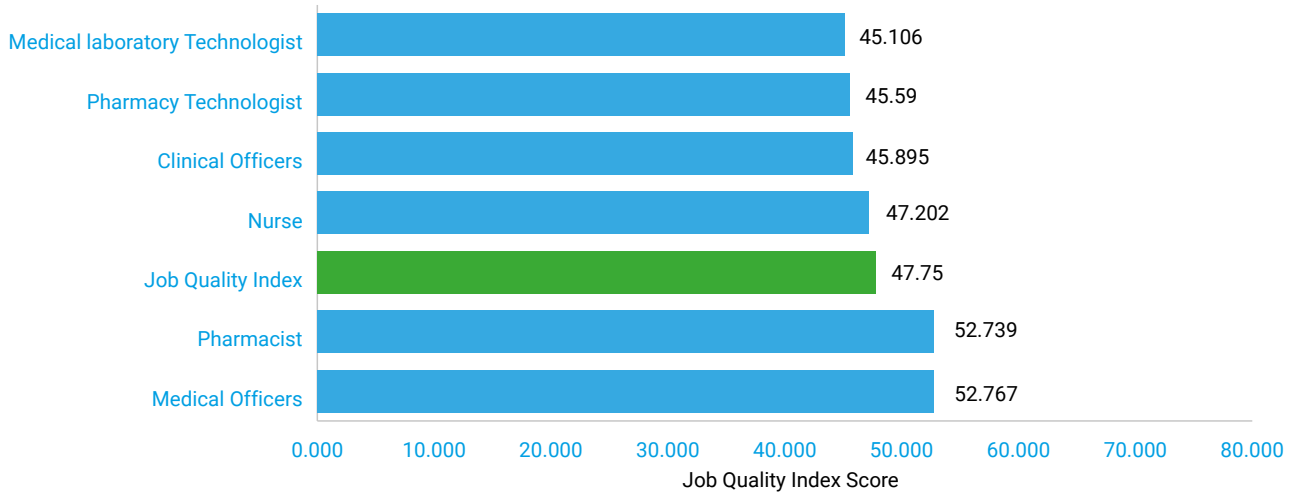
Overall, the quality of health worker's job was rated as 47.75%. However, this varied across dimensions. The dimension where there was highest performance was quality of working environment while the area with the least performance was on the quality of earning. The components are discussed in more details in the section below.

Table 33: Overall job quality scores of health workers

Job Quality Dimensions	Number(n)	Mean	Std Error	95 CI	
Overall-Job Quality Index	371	47.75	0.39	46.98	48.51
Quality of Earning Score	347	16.09	0.62	14.87	17.31
Labour Market Security score	371	58.04	0.63	56.79	59.28
Unemployment security score	360	57.01	1.11	54.82	59.20
Extreme Low Pay security score	365	58.90	0.74	57.45	60.36
Quality of the Working Environment score	371	66.27	0.44	65.4	67.13
Job Resources Score	371	73.84	0.64	72.57	75.10
Job Demands Score	371	58.70	0.62	57.47	59.92

When compared across all cadres, the highest job quality index was reported amongst medical officers and Pharmacists while the lowest was reported amongst medical laboratory technologists. The performance across the different dimensions does not vary by cadre.

Figure 44: Job quality scores of health workers by cadres



6.5.1 Quality of Earning Score

The Quality of Earning being the least performing component of job quality was also confirmed from the qualitative interviews. There were complaints about low remuneration. An example was given of a situation in which health workers in certain counties received a basic salary of KES 24,000 at their diploma entry level with a house allowance of KES 4,000. Within this area, average rent for a one-bedroom apartment was reported to be KES 20,000/month thus presenting a challenge for the health worker. Related to this, it was reported that many healthcare workers were willing to relocate to other institutions or countries also preferring well-paying jobs even if they were not related to what they pursued in college. As we indicated earlier, on average, the health workers were earning below their reservation wage.

In addition, respondents also reported the issue of delays in salary payment. For the private and FBO facilities that depend on their own source revenue, delays in payments led to accumulation of debts including paying the salaries of staff or avail supplies as required, affecting overall performance of the facility.

6.5.2 Labour Market Security score

With regards to employment security, health workers recruited on short term/temporary contract were found to be dissatisfied with their employment terms and were seeking to be employed on

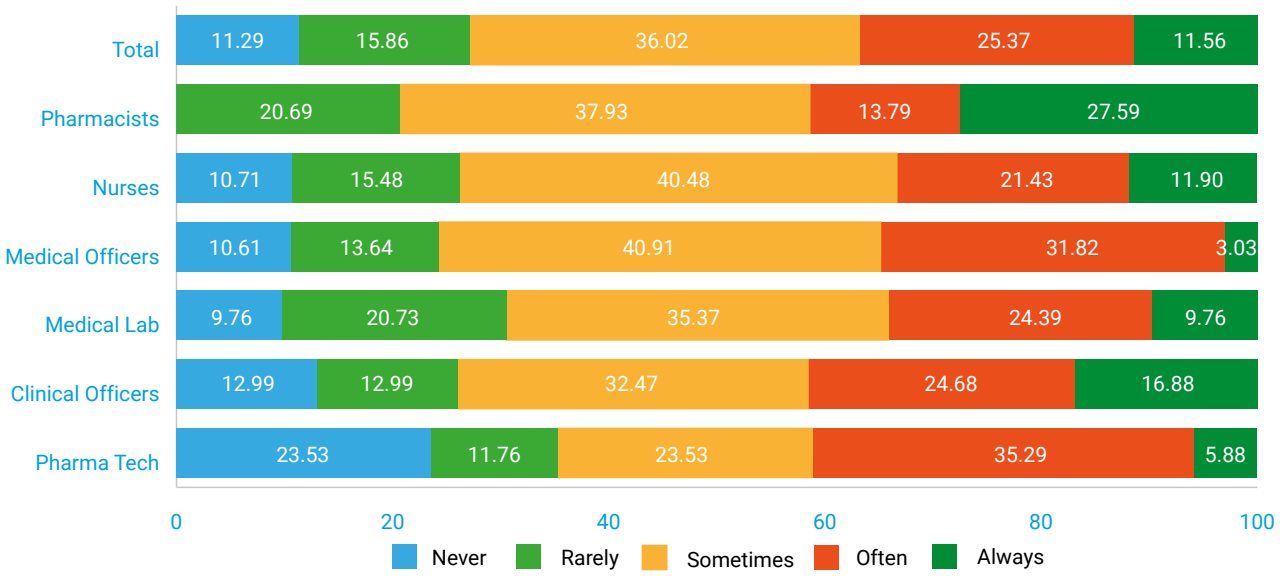
permanent and pensionable terms. They were also noted to receive poor remuneration or had pay that was not equal to their counterparts who were hired at the same time, working in the same facility but under different employment terms

6.5.3 Working Environment/Career Progression and Learning Opportunities

The ability to progress career wise remains one of the key motivators of health care worker's ability to deliver the required health services to the population. Within the health sector most of the cadres have clear career progression paths with the employers facilitating or enabling staff pursue career progression courses.

Most of the respondents noted that there were opportunities for learning sometimes averaging around 36% across all cadres sampled. However, more than 10% of the respondents indicated that there were never any learning opportunities.

Figure 45: Availability of learning opportunities (by cadre)



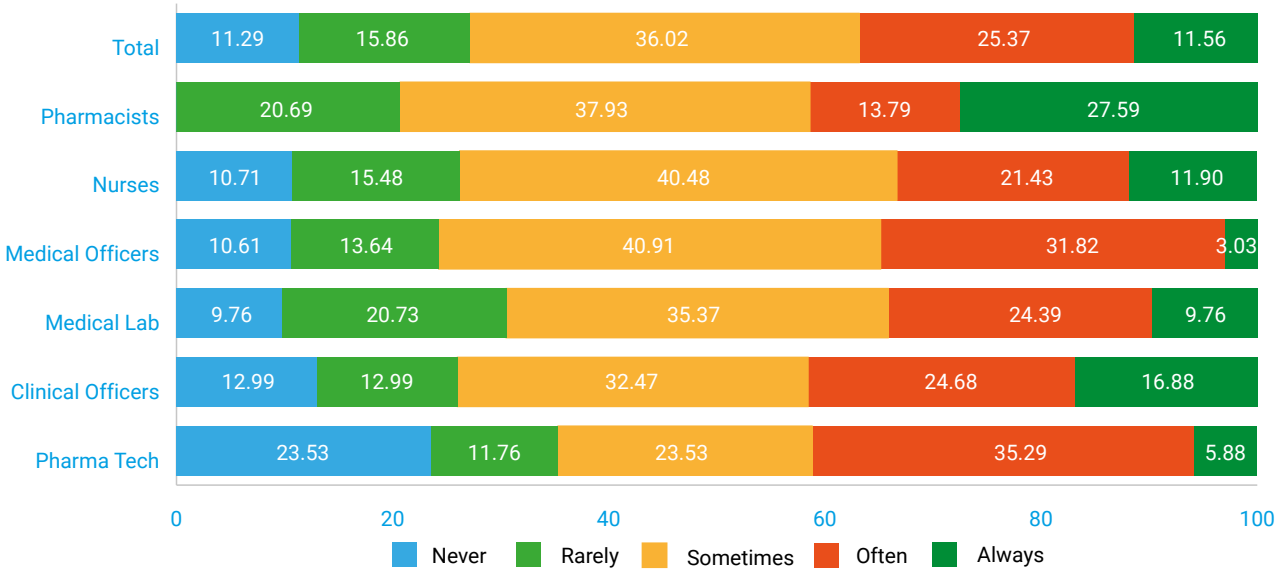
However, from the qualitative interviews, one of the job quality dimensions that was of concern was the issue of promotions. In some cases, it was reported that there were no promotions despite health care workers undertaking performance appraisal routinely. An annual performance appraisal system was in place in some facilities with mid-year reviews undertaken by the designated authority for consideration for promotion while some facilities were noted not to conduct annual performance contracting/appraisals.

Staff interviewed felt that performance appraisals were done as a formality but not anchored and followed through to advise the promotions and other human resource related processes such as staff development. The appraisals were mostly conducted to advise on contract renewal for contracted staff. It was noted that career progression and promotion became a challenge for healthcare workers especially in private and faith-based facilities. In some cases, it was reported that there were no promotions despite health care workers undertaking performance appraisal routinely.

Career Progression and Learning Opportunities

Most of the respondents noted that there were opportunities for learning sometimes averaging around 36% across all cadres sampled. However, more than 10% of the respondents indicated that there were never any learning opportunities.

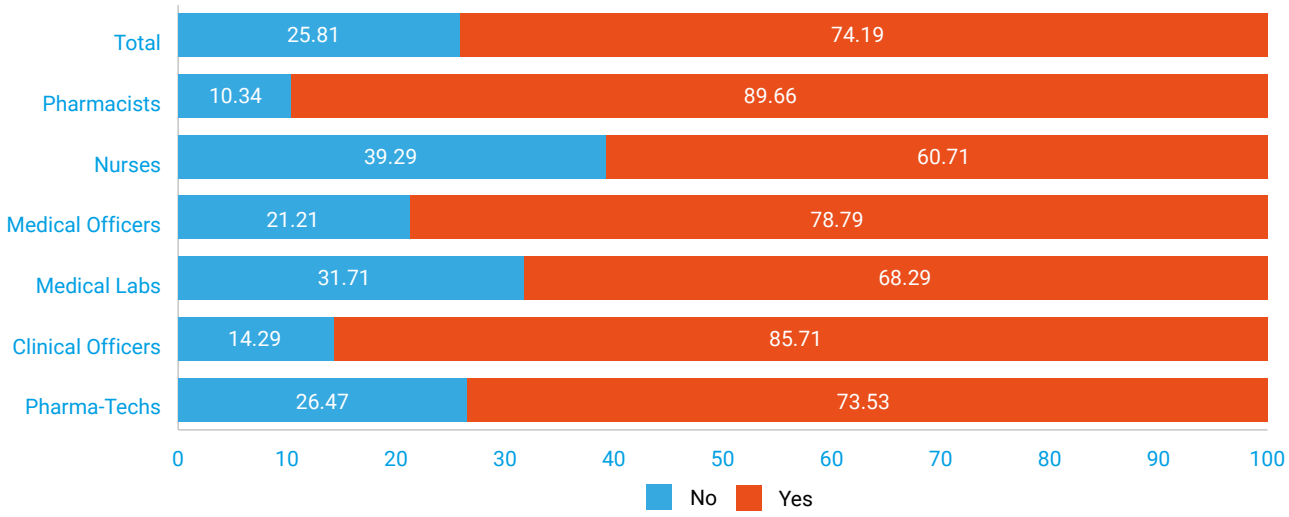
Figure 46: Availability of learning opportunities (by cadre)



Membership of a Union

It is anticipated that with health care workers participating in unions it allows them to better negotiate with the employers for better terms of service and hence is a key component of job quality. Most of the health workers belong to unions although there were still some who reported not being unionised.

Figure 47: Membership of a Union (by Cadre)



6.6 Demand for Health Workforce from the perspective of Health Facility Managers

This section summarises findings on the demand for health workforce based on expressed need, health workforce demand measures such as vacancy rates, applicants per advertised posts and recruitment efficiency.

6.6.1 Need for Heath Workers

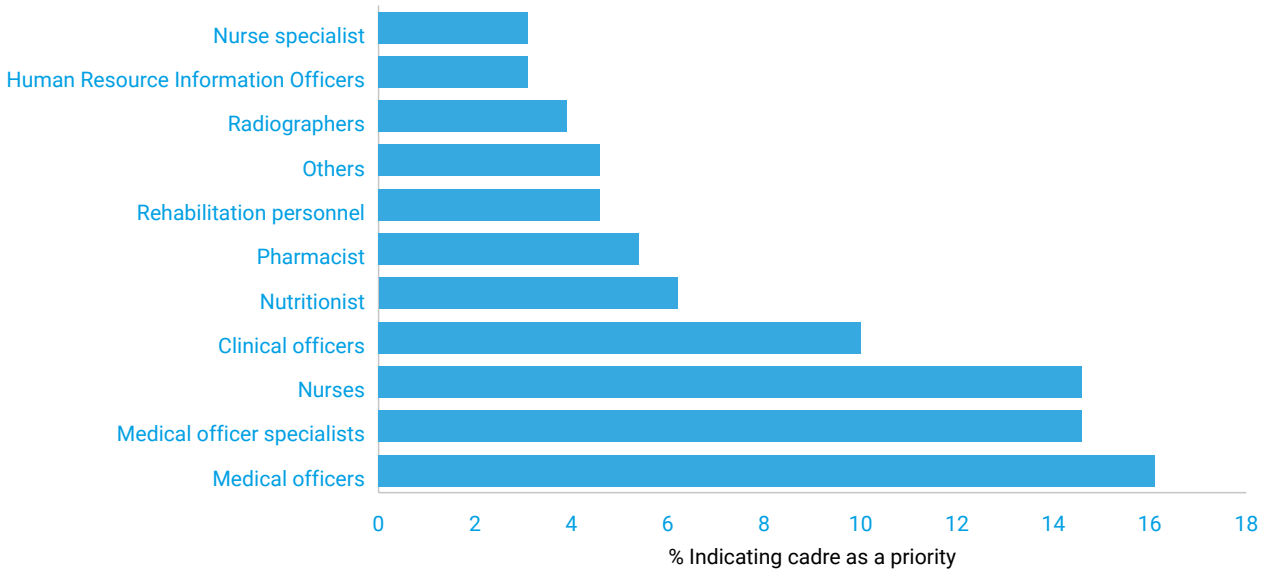
The shortage of healthcare workforce remains one of the key issues affecting health service delivery as most of the counties reported gaps in the health workforce. The proportion of expressed need for the different health facilities covered by the funded positions was estimated at 73%. This varies according to ownership with the private the highest at 79% followed by FBO at 76% and public at 70% respectively. While public sector was shown to have the highest shortage in terms of funded positions for the level of need, health worker employment is a major challenge due to limitations on the wage will. Similar financial constraints within the private and FBO were noted to slow down hiring of much needed healthcare personnel.

Table 34: Proportion of proposed need that is funded

Ownership	N	Mean	Min	Max	SD
FBO	146	76.011	6.667	200	32.17
Public	435	70.534	3.333	150	28.591
Private	90	79.64	3.125	100	27.756
All	**672**	**72.94**	**3.13**	**200**	**29.44**

From the qualitative interviews, the respondents were also able to prioritise some of the key gaps in terms of the health workers they needed at the health facilities. The key cadres where there was expressed need in terms of additional numbers at the health facilities are summarised below.

Figure 48: Cadres expressed as a priority need



However, it is important to note that in a number of health facilities, the establishment in terms of the number of staff required/approved were not always known to facility level managers in public hospitals especially in situations where these were being managed at county level. Additionally, the respondents noted that emerging needs did not inform staff recruitment and filling of health worker vacancies.

6.6.2 Facility reported vacancy rate

The vacancy rate measures the proportion of total posts that are vacant. This estimation of vacancy rates can be based on the number of posts vacant when compared with established positions (both filled and unfilled), which termed as 'indicative demand'. However, this measure of vacancy rates does not capture the extent of availability of funding to fill the positions, known as the 'effective demand'. In addition to vacancy rate (based on establishment) we also estimated vacancy rate (based on funding). When based on the approved positions in the establishment, the vacancy rate averaged 13.68% of the total established posts. However, when you consider available funding, the vacancy rates, the estimated vacancy rate is 5.53%.

The difference between vacancy rates with and without funding is highest within the public sector implying that public facilities are more challenged to in filling their vacancies. Facility respondents

noted that while they were aware of the different cadres needed, inadequate financing played a big role in their ability to hire staff. Within the private facilities and FBOs demand for health workforce is was based on availability of funds. When funds were available, positions were established, and staff were hired on a need basis as services grew and workload increased.

Table 35: Vacancy Rate (By type and by ownership)

Ownership	N	Mean	Min	Max	SD
Established Positions					
FBO	112	12.91	0.00	81.82	22.15
Public	301	13.7	0.00	92.86	24.95
Private	83	14.8	0.00	95	26.07
Overall	497	13.68	0.00	95	24.48
Only Funded Positions					
FBO	54	7.98	0.00	50	16.51
Public	212	3.53	0.00	75	12.51
Private	71	9.66	0.00	95	21.43
Overall	337	5.53	0.00	95	15.62

Although the number of staff hired by partners was noted to be minimal, some counties reported that they did not have full grasp on the number and cadres of staff employed by various partners who supported activities in their county. They did not have an idea of the wage bill that would be required to support filling the vacancy in case there was a cessation of partner support for that position.

6.6.3 Applicants per advertised posts

Analysis by cadre indicates that there were more applicants per advertised positions indicating that supply was higher than demand. Overall, the applicants were 5.2 times more than the advertised positions. This may be attributed to oversupply of healthcare workers in the Kenya labour market. Analysis by facility ownerships indicates that in the FBO facilities had (12.3 times) more applicants per advertised position than in public (1.4 times) and private (1.3 times).

Table 36: Applicants per advertised post by Ownership

Ownership	N	Mean	Min	Max	SD
FBO	6	12.33	0.50	50	19.09
Public	8	1.40	0.20	4.55	1.32
Private	3	1.33	1.00	2	.58
Over all	17	5.25	0.20	50	11.99

While the estimates above show that in general supply is higher than the demand, from the qualitative interviews it was reported for some cadres/specialisation there was scarcity. The key cap was especially for specialist's workers were reported to be scarce in the counties. This was addressed by temporary engagement of specialists within faith based organisations and certain private facilities. In other cases, rotational duties stations for specialists were adopted by County Governments to increase coverage in marginalized/rural sub counties and where specialists do not wish to work full time or where infrastructure at certain health facilities did not support some specialized services.

In some instances, there were challenges for recruitment of cadres with specific qualifications. This was the case for medical laboratory professionals in the public sector for whom certificate and diploma holders were more easily able to obtain employment at job groups G, H. It was reportedly very rare for the degree holders to get direct entry into employment as the scheme of service in use is not updated to take care of the degree holders. It was reported that degree holders could only be employed through internal advertisement.

6.6.4 Time taken to fill a funded position

This is the average time taken to fill a position that is funded – which is an indication of a proxy of process efficiency and labour market mismatches. On average it takes 7.5 months for a funded vacancy to be filled. Lengthy administrative processes, political interference in hiring or replacing staff were also cited as a cause for delay in recruitment of health workers.

It takes much longer in public facilities (11 months), private (2 months) and faith-based (1 month) to fill a funded post. This may have been attributed to bureaucracy related to recruitment, competing priorities, lack of HR units within the health facility to address matters of human resource as well as weak HRH planning and succession management.

Table 37: Length of period (months) for vacancies funded but not filled by ownership

Ownership	N	Mean	Min	Max	SD
FBO	140	1.09	1.0	36	4.885
Public	415	11.31	1.0	180	32.351
Private	142	2.44	1.0	120	14.999
Time funded not filled	**697**	**7.448**	**1.0**	**180**	**26.364**

6.7 Health Care Workers attrition

In terms of attrition which measured the rate of exit of the workers in-post in a given time, there was an attrition rate averaging 5.54% annually with public facilities having a higher rate than private and FBOs. Analysis by facility ownership indicates that the public had the highest attrition

rate at 6.6% per annum followed by faith based by 5.2% and private 2%. From the qualitative interviews, we found that government facilities had a challenge with succession planning.

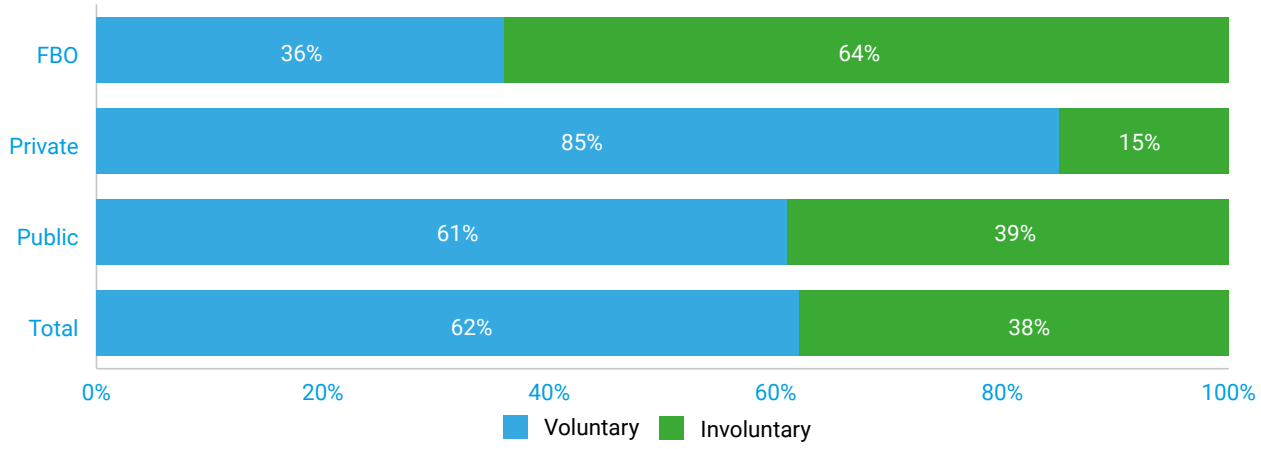
It was noted that in some cases replacement was not done in case of retirement or death of a health worker. Interviewees reported that despite the high workload in government facilities it was hard to replace staff who had left due to voluntary and involuntary attrition. The process of replacing staff was reported to be lengthy, tedious and not predictable which is reflective of lack of a clear recruitment plan.

Table 38: Attrition rate by Ownership

Ownership	N	Mean	Min	Max	SD
FBO	159	5.23	0.000	100	17.58
Public	543	6.64	0.000	100	21.28
Private	156	2.08	0.000	50	8.75
Attrition Rate	**859**	**5.54**	**0.000**	**100**	**18.97**

In terms of the pattern of attrition, voluntary attrition was most prominent, contributing over 60% of all exits from the health facilities.

Figure 49: Attrition pattern by Sector




MACHAKOS

Section 7

7. RECOMMENDATIONS FOR POLICY AND STRATEGIC ACTIONS

Based on the findings of the HLMA, it is recommended that the Ministry of Health coordinate a range of collaborative policy interventions and initiatives involving other stakeholders and sectors to address the current and anticipated challenges of the health labour market. The main recommendations arising from the analysis are grouped into six (6) thematic areas:

1 Prioritise multisectoral health workforce governance, planning and investment to address population health needs and increase health worker absorption and retention in the health labour market.

1.1. Following the completion of the HLMA, urgently convene a high-level multi-sectoral health workforce investment forum, bringing together Ministries of Finance, Education, Labour, Treasury, SRC, the private sector and development partners) to build consensus on a sustainable approach for allocating at least additional 11% budget space in the public sector for investing more in the health workforce employment to forestall the looming crisis of paradoxical unemployment of health workers who are needed in the frontlines of service delivery. This dialogue should also prioritise mechanisms to protect the private sector jobs and potentially boost their capacity to absorb more health workers.

1.2. Using the consensus from the high-level forum, jointly develop a multi-sectoral national health workforce policy and investment plan with the Ministries of Finance, Education and Labour which has demonstrable return on investment for the respective sectors who will formally endorse it and commit to including the relevant (or assigned) areas of investment in their MTEF and annual operational budgets. This milestones for this investment plan should be monitored annually.

1.3. Use the national health workforce investment plan to advocate for a sustained 11% annual increase in the health sector annual wage bill to meet the annual population rise and need.

1.4. Urgently complete the Workload Indicators of Staffing Needs (WISN) study and use the evidence to develop nationally agreed staffing norms and standards with operational guidelines to harmonise health workforce planning and staffing decisions across counties and national government.

1.5. Using the nationally agreed staffing norms and standards conduct a periodic (every 2-3 years) HRH gap analysis or HRH audit of health facilities, leveraging on a robust and fit-for-purpose HRH information system to facilitate streamlining HRH distribution and rationalise the health workforce skill mix using the need-based analysis to reduce inefficiencies in the mix of health workers.

1.6. Increase the investment in the training of specialist health professionals (e.g Medical Specialist; Specialised Nurses; and Laboratory Scientists) in line with health workforce

projections to address the epidemiologic and demographic transition of the country arising from ageing population and NCDs.

2 Optimise the quantity and quality of health workforce education and training (production) to address the evolving population health needs.

2.1. Develop a master health workforce development (training and education) roadmap in line with the labour market projections herein, in collaboration with the Ministry of Education, the Health Training Institutions and professional regulatory bodies to align future production in terms of calibre and quantity to the population health needs of the country.

2.2. Institute a periodic multi-sectoral health workforce development and investment meeting to build consensus on the quantity and mix of intake into training institutions, taking into account, the health needs and economic capacity of the country as well the potential for exportation of skills in the health professions. Participation should include but not limited to Ministries of Health, Finance, Education, Labour, Private Sector players, Public Services Commission, Health Training Institutions and Development Partners.

2.3. Revise the Kenya Essential Package for Health (KEPHS) to reflect the current and anticipated population health needs and to translate the same into a National Framework of Skills and Competencies for Health Professionals that would guide practice and curriculum planning and development across disciplines and institutions.

2.4. Using the National Framework of Skills and Competencies for Health Professionals, review curricula to engender competency-based training and education for health professionals.

2.5. Develop guidelines for adequate oversight of the private sector with the view of streamlining dual practice in order to mitigate any adverse effect thereof.

3 Improve the regulation and oversight of the health workforce to enhance the competencies for delivery of quality health services

3.1. Develop/review the scope of practice for all health professionals with the view to streamline and harmonise where appropriate to curtail overlaps, role duplications and potential for labour substitution.

3.2. Urgently map out all unregulated health professionals and bring them under an appropriate regulatory body to protect the public and further enhance quality and ethically appropriate health services.

3.3. Establish and/or strengthen mechanisms for uniform standards for health facilities in both public and private sector especially on health workforce requirements and skill mix to ensure quality across the board.

4 Strengthen health workforce data, evidence generation and use for enabling effective policy, decision making and investments.

Accelerate the implementation of the National Health Workforce Account (NHWA) and Kenya health workforce observatory to triangulate and harmonise health workforce data and information across all sectors of the country, ensuring an annual update of the NHWA data by August of each year.

4.1. Accelerate the finalisation and implementation of the data sharing agreement with private sector and other sectors to enhance the collection of comprehensive data on the health workforce.

4.2. Urgently invest in revamping or developing/adopting a robust national Human Resource Information System (HRIS) to be deployed nationally (and across all counties) for real-time routine HR management and for generating relevant staffing data for planning and monitoring.

4.3. Produce and widely disseminate a concise Annual State of HRH information sheet or infographic to facilitate evidence-informed health workforce investment dialogue across both the public and private sectors.

4.4. Systematically train HR managers and practitioners on health workforce data analytics and use of workforce intelligence for strategic decision making and advocacy.

5 Health Workforce Retention and Mobility Management

5.1. Develop multi-dimensional retention strategies that incorporate key motivators at both the employer and facility levels, thereby fostering workforce stability

5.2. Establish an Inter-County Mobility Management system to address and rectify urban-rural imbalances in the health workforce.

5.3. Develop and implement data-driven mechanisms to facilitate equitable allocation of health workers across Counties, healthcare levels, and specialities

5.4. Develop and implement a comprehensive migration policy aligned with the World Health Organization's Code of Practice on the International Recruitment of Health Personnel. This will help maximise the benefits and minimise the detriments resulting from international healthcare workforce migration.

5.5. Conduct a systematic and annual health workforce gap analysis of health facilities to inform an operational and adaptable recruitment planning process tailored to meet both existing and emergent healthcare needs.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