

# THE REPUBLIC OF RWANDA



## 10-YEAR GOVERNMENT PROGRAM: NATIONAL STRATEGY FOR HEALTH PROFESSIONS DEVELOPMENT 2020 – 2030

## LETTER OF INTRODUCTION

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Health and well-being of a country's population are key determinants of development. When citizens are healthy, they are more productive to their communities leading to wealth and development. The economic development produces a virtuous circle of better health and a rise in productivity that boost the economic growth. Therefore, developing a workforce that suitably responds to the population health needs is critically important to Rwanda.

It is my pleasure to present the Rwanda National Strategy for Health Professions Development (NSHPD) 2020-2030. This document details the interventions and investments necessary to achieve the goal of this ten-year strategy: Substantially increasing the accessibility and coverage of high-quality health services across Rwanda by ensuring the availability of a qualified, competent, and equitably distributed health workforce. Health workforce remains a key pillar of the national effort to achieve Universal Health Coverage (UHC) in Rwanda.

The NSHPD outlines an ambitious yet focused suite of investments to comprehensively strengthen the public health workforce and move towards a sustainable national training capacity. The emphasis on primary health care providers in pursuit of UHC is complimented by a focus on quality of service and quality of training. Strategies to develop Rwandan faculty are complimented by major investments in teaching equipment and infrastructure and in our hospitals to serve as high quality teaching sites across the country. These strategies build on the success of the Rwanda Human Resources for Health Program (2012-2019) with a renewed emphasis on building the capacity of the University of Rwanda College of Medicine and Health Sciences and associated health professional institutions.

The development of the NSHPD involved a broad range of stakeholders across several ministries and organizations. I would like to thank all those who contributed their time and efforts to develop such a comprehensive plan.

Since the conclusion of the planning process of the NSHPD, the COVID-19 pandemic has only further highlighted the challenges faced by health systems and health workforce all around the world. Hence, Rwanda remains committed to the development of its health workforce to ensure it is better equipped to deal with all the health challenges occurring currently and in the future. Providing excellent health services is so crucial to the achievement of Rwanda's broader development goals.

We look forward to engaging with partners both old and new to ensure the interventions in this strategy are sufficiently addressed and delivered to the highest standards. The success of the HRH program has shown what major long-term commitments built on trust and collaboration can achieve, and we are eager to continue to build towards a stronger, healthier Rwanda.


**Dr. Daniel M. Ngamije**  
**Minister of Health**

## ACKNOWLEDGEMENTS

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The HRH Secretariat wishes to acknowledge all those who devoted their ideas, effort, and time to developing this comprehensive strategy. We extend our immense gratitude to people from different government institutions, especially representatives from the University of Rwanda College of Medicine and Health Sciences and international academic institutions that have supported the HRH Program for the past eight years; as well as representatives from Ministry of Education, Ministry of Finance, Ministry of Labor, Rwanda Development Board, Health Professional Councils and Associations bodies, Teaching Hospitals and Sites, Clinton Health Access Initiative, Inc., and Ministry of Health.

From mid-2019 to early-2020 these stakeholders have convened to develop ambitious national public-sector health workforce targets, enrollment and graduation targets from the relevant training programs, faculty development, quality of training, and infrastructural interventions needed to meet these targets. We look forward to continuing the collaboration with these partners towards the successful implementation of this strategy over the next ten years.

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## 2 ABBREVIATION AND ACRONYMS

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<b>Acronym</b>	<b>Definition</b>
BDS	Bachelor of Dental Surgery
BDT	Bachelor of Dental Therapy
CDC	Centers for Disease Control
CHUB	Centre Hospitalier Universitaire de Butare (University Teaching Hospital of Butare)
CHUK	Centre Hospitalier Universitaire de Kigali (University Teaching Hospital of Kigali)
CMHS	College of Medicine and Health Sciences
DG	Director General
DH	District Hospital
DP	Development Partner
DVC	Deputy Vice Chancellor
ENT	Ear, Nose, Throat (Otolaryngology)
GOR	Government of Rwanda
HC	Health Center
HEC	Higher Education Council
HOD	Head of Department
HRH	Human Resources for Health
KFH	King Faisal Hospital
RMH	Rwanda Military Hospital (Kanombe Hospital)
MDG	Millennium Development Goal
MHA	Master of Health and Hospital Administration
MIFOTRA	Ministry of Public Service
MINECOFIN	Ministry of Finance and Economic Planning
MINEDUC	Ministry of Education
MINISANTE	Ministry of Health
MMed	Master of Medicine
MOE	Ministry of Education
MOH	Ministry of Health
MOU	Memorandum of Understanding
NCD	Non-Communicable Disease
OB/GYN	Obstetrics and Gynecology
PEPFAR	President's Emergency Plan for AIDS Relief
RMDC	Rwanda Medical and Dental Council
SOD	School of Dentistry
SOMP	School of Medicine and Pharmacy
SONM	School of Nursing and Midwifery
SOP	Standard Operating Procedure
UR	University of Rwanda
USD	United States Dollars
WHO	World Health Organization

## 3 EXECUTIVE SUMMARY

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### 3.1 INTRODUCTION AND RATIONALE

Over the years, Rwanda has been innovating to develop its health workforce, starting with the establishment of the Community Health Program in 1995 through the Rwanda Human Resources for Health (HRH) Program (2012-19)—an ambitious initiative that aimed to strengthen the health workforce across disciplines through significant investments in pre-service training.

These initiatives, alongside other health systems strengthening investments, have contributed to remarkable progress in population health. As of 2015, the maternal mortality ratio (MMR) was 210 maternal deaths for every 100,000 live births down about 72% from an MMR of 750 in 2005<sup>1</sup>. The 2015 Demographic and Health Survey shows that by 2015, 91% of births were assisted by a skilled health provider, up from 39% in 2005. In the last decade access to specialty services has increased while primary and secondary care has been strengthened to bring services closer to the population.

Health workforce development remains a top national priority. Both Vision 2020 and the National Strategy for Transformation 1 (NST 1) emphasize increasing the number, capacity, and quality of specialized health personnel and improving the quality of health care as a focus of health policy. Rwanda's fourth Health Sector Strategic Plan 2018-24 (HSSP IV) includes a strategic goal of having a qualified, competent, motivated and equitably distributed health workforce that is able to deliver quality health services.

While acknowledging commendable progress that has been made, the Government of Rwanda continues to strive toward further advancing its health workforce. Pipeline analysis completed in 2019 indicates that many training programs are chronically under-enrolled and at current rates will not reach the workforce vision set by MOH. Furthermore, while the previous Rwanda HRH Program dramatically increased the specialty level in the country many of these specialists—including those who work in the private sector—are predominately located around Kigali, and the educational programs are not yet self-sustaining. The country is committed to further advancing the skill level of its workforce and will need to address issues of distribution and workforce management as well as sustainability of training to achieve its stated workforce goals and continue making progress toward universal health coverage.

The NSHPD design and planning process initiated in mid-2019 and planning was concluded in February 2020, shortly before the WHO declared COVID-19 a pandemic in March 2020. The full impact of COVID-19 on health sector budgets, health professional needs, and supply and demand for training continues to be monitored. The interventions outlined in the strategy will necessarily need to be adjusted as the strategy is operationalized to reflect the changing reality of the pandemic. At the same time, the pandemic has highlighted the ever pressing need to strengthen health systems by adequately training, hiring, and protecting health workers. The Government of Rwanda recognizes this need and continues to prioritize health workforce development as a means to strengthening its health system as it responds the current pandemic.

### 3.2 PREVIOUS INITIATIVES

In 2012 the Government of Rwanda launched the Human Resources for Health (HRH) Program—a seven-year initiative that set out to build the health education infrastructure and health workforce necessary to create a high quality, sustainable healthcare system in Rwanda. Through high level advocacy between the Government of Rwanda, US

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<sup>1</sup> National Institute of Statistics of Rwanda (NISR) [Rwanda], Ministry of Health (MOH) [Rwanda], and ICF International. 2015. Rwanda Demographic and Health Survey 2014-15. Rockville, Maryland, USA: NISR, MOH, and ICF International.

Government, and the Global Fund, the Ministry of Health was able to secure significant funding (approximately USD 100M) against this broad-sweeping health workforce initiative.

An internal review conducted in 2019 at the end of the seven years found that the program was overall successful in dramatically increasing the production capacity of University of Rwanda’s College of Medicine and Health Sciences (CMHS)—the only government-funded higher education institution in the country—to train prioritized cadres, and therefore in making major contributions to the number of health workers from prioritized cadres in the public sector. An estimated 4,357 graduates were trained in prioritized academic programs.

School	Graduates 2012-13 to 2018-19
School of Medicine and Pharmacy	306
School of Dentistry	271
School of Nursing and Midwifery	3717
School of Public Health	63

As a result of program investments and activities 17 new training programs were introduced at the University of Rwanda: Masters of Medicine (MMed) in Emergency, Neurosurgery, Orthopedic Surgery, Pathology, Psychiatry, Urology, and Radiology; Bachelor of Science in Midwifery; Masters of Science in Nursing in Medical Surgical Nursing, Neonatal Nursing, Nephrology Nursing, Nursing Education, Leadership and Management, Oncology Nursing, Pediatric Nursing, and Perioperative Nursing; Bachelor of Science in Dental Surgery; and Masters of Hospital and Healthcare Administration. Each of these new programs is the only of its kind offered in Rwanda, and in some cases in the region. Rwanda now offers more disciplines of nurse specialist training than any other country in Sub-Saharan Africa other than South Africa.

These investments yielded significant improvements in the availability of qualified health workforce. Specifically:

- The doctor per population ratio improved from 1 doctor/16,001 people in 2010 to 1/8,919 in 2018.
- The numbers of Rwandan specialists in country increased from 94 in 2009 to 436 in 2018.
- The nurse per population ratio improved from 1 nurse/1,291 people in 2010 to 1/1,094 in 2017, with overall significant shifts in the skill level of the nursing population.
- The midwife per population ratio improved dramatically from 1 midwife /66,749 people in 2010 to 1/4,064 in 2017.

Experience from the first Rwanda HRH Program highlights several crucial learnings that will inform the National Strategy for Health Professions Development (2030). Notably, while the Rwanda HRH Program achieved very impressive and large-scale results, not all academic training programs supported by the program were able to establish sustainability, largely because they were unable to generate and retain the full extent of appropriately qualified University of Rwanda faculty to deliver the program at quality standards, and therefore remained reliant on visiting faculty. These and other lessons learned have been reflected in the development of the National Strategy for Health Professions Development (2030).

### 3.3 NEXT PHASE: THE NATIONAL STRATEGY FOR HEALTH PROFESSIONS DEVELOPMENT (2030)

In the next phase of health workforce development, the Government of Rwanda intends to expand upon the success of the Rwanda HRH Program (2012-19). The National Strategy for Health Professions Development (2030) will put more emphasis on several key aspects.

1. **Educational sustainability** – The National Strategy for Health Professions Development (2030) places explicit emphasis on faculty sustainability interventions and—building from quantitative analyses to indicate faculty requirements and development trajectories—plans for accelerated activities to attract, train and retain

Rwandan faculty. This includes policy actions to attract more highly qualified providers to academic careers, as well as interventions such as study abroad to ensure Rwandans gain the qualifications they need to provide high quality training.

2. **Education environment** – In addition to addressing the key inputs to educational programs—faculty, equipment and infrastructure—required for individual academic programs, the strategy also provides for enhancing the overall context within which training takes place. This is achieved through reforms to the governance and management structures of teaching hospitals, as well as to overall infrastructural upgrades of teaching sites that are intended to unify management structure in teaching hospitals and therefore improve coordination across teaching, clinical and research dimensions.
3. **Quality alongside quantity** – While significant advances were made in increasing the overall quantity and qualification level of the Rwanda health workforce, anecdotally it is acknowledged that challenges persist with professionalism and the quality of care that health workers provide in the public system. Strategies are proposed to ensure that practicing providers deliver high quality of care with adherence to principles of professionalism and ethics. This is addressed through interventions across the lifecycle of a health worker, including pre-selection, pre-service training strategies, and support and regulation mechanisms in facilities and through councils.
4. **Robust planning and monitoring** – Analysis of the HRH Program (2012-19) found that some programs were under-enrolled to reach stated targets. To mitigate for this risk, the National Strategy for Health Professions Development (2030) will facilitate tuition support for trainees in supported programs. A pipeline analysis was conducted for all prioritized cadres, including undergraduate medical training to ensure that enough General Practitioners are produced to allow for high rates of specialization. The strategy includes significant investments to expand infrastructure and equipment for undergraduate medical training as well as other health professionals to ensure a robust training pipeline.

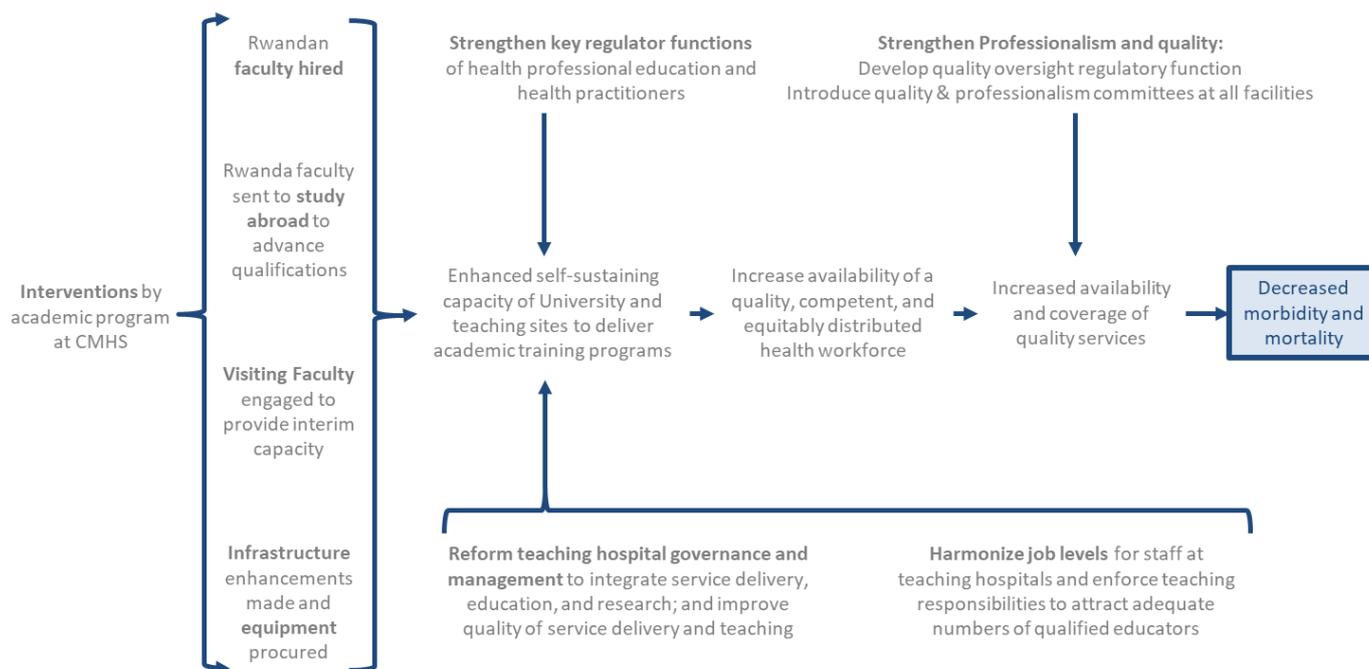
In addition, the National Strategy for Health Professions Development (2030) is novel in its scope—adding new programs at both ends of the spectrum of care, from Biomedical Lab Scientists, to sub-specialists who will be trained through the introduction of ten new fellowship training programs, thereby ensuring Rwanda makes parallel advancements in the provision of primary, secondary and tertiary care.

### 3.4 OBJECTIVES

The overall goal of the National Strategy for Health Professions Development (2030) is to contribute to a substantial increase in the availability and coverage of high-quality services across Rwanda by improving the **availability of a qualified, competent and equitably distributed health workforce**. The strategy addresses one of the primary bottlenecks to workforce development, which is the capacity of domestic institutions to train needed health workers.

Figure 3.4.1.i provides an overview of interventions by academic program at CMHS with the ultimate intention of decreasing morbidity and mortality rates through a theory of change.

Figure 3.4.1.1: National Strategy for Health Professions Development – Theory of Change



The strategy is anchored against public sector health workforce targets that will contribute to a more available, qualified, and equitably distributed public health sector workforce. These national health workforce targets for 2030 are based on facility-level staffing norms that were developed by MOH to ensure that this pre-service strengthening strategy makes strides toward a long-term vision for its health workforce. In addition to defining the national public sector health workforce target the strategy indicates a programmatic target—the share of the national target that this strategy expects to achieve at a minimum based on assessments of how much current training capacity may reasonably be scaled. In some cases the program aims to achieve 100% of the 2030 public sector health workforce target; in other cases, the program will achieve a share of the national target. An expanding private sector and additional potential investments may help bridge the gap toward achieving the national target over the ten-year period.

The MOH-set targets and the program’s contribution targets for the **37 academic programs** in scope are listed below in Table.3.4.1.A organized by service delivery cluster. The norms that produced the MOH targets are outlined in each distinct intervention strategy section. In addition, the strategy calls for the introduction of 10 new sub-specialty fellowship programs.

Table 3.4.1.A Ministry of Health and Program Contribution Targets

Program*	National Health Workforce Target 2030	Forecasted Workforce 2030 with Proposed NSHPD Interventions	% National Health Workforce Target 2030 NSPHD Aims to Achieve
<b>Women and Children's Health</b>			
Midwifery (A1)	2621	1176	45%
Midwifery (A0)	1030	368	36%
Master of Midwifery	39	47	121%
Master of Nursing: Pediatrics	173	139	80%
Master of Nursing: Neonatal	158	160	101%
Physician: Obstetrics & Gynecology	270	131	49%
Physician: Pediatrics	239	148	62%
<b>Medicine and Non-Communicable Diseases*</b>			
Master of Nursing: Nephrology	38	38	100%
Physician: Internal Medicine	186	170	95%
Master of Nursing: Oncology	84	84	100%
<b>Emergency Medicine</b>			
Master of Nursing: Critical Care/Trauma	336	206	61%
Physician: Emergency Medicine	74	65	88%
<b>Surgery/Anesthesia*</b>			
Non-Physician Anesthetist (A0)	556	557	101%
Master of Nursing: Medical Surgical	302	214	71%
Master of Nursing: Perioperative	254	172	68%
Physician: Anesthesiology	162	135	83%
Physician: Otorhinolaryngology (ENT)	124	59	48%
Physician: Surgery-General	140	103	73%
Physician: Surgery-Neuro	30	10	33%
Physician: Surgery-Orthopedic	60	60	100%
Physician: Surgery-Urology	38	20	53%
<b>Mental Health*</b>			
Physician: Psychiatry	44	39	89%
<b>Diagnostics and Support Services*</b>			
Biomedical Laboratory Scientist (A0)	826	670	81%
Physician: Pathology	54	52	96%
Physician: Radiology	54	37	69%
<b>Oral Health</b>			
Dental Therapy (A0)	1244	261	21%
Dental Surgery (A0)	124	143	115%
<b>Sensory Services</b>			
Audiology (A0)	121	64	53%
Speech Therapy (A0)	121	64	53%
Physician: Ophthalmology	44	37	84%
<b>Leadership and Management</b>			
Nurse: Education, Leadership, and Management	79	78	99%
Master of Hospital and Healthcare Administration	172	193	112%
<b>Undergraduate Medical Education</b>			
Undergraduate Medical Education	1018	976	96%

\*Prioritized cadres for which interventions have not yet been designed (four out of 37 prioritized cadres) include: Biomedical Engineers, Mental Health Nursing, Perfusion Therapy, and Occupational Therapy

### 3.4.1 Expected Results

Over the course of ten years, **6513 health care professionals will graduate from the 37 supported programs**. Almost half of these will be new health professionals from direct entry programs such as Biomedical Lab Sciences or Dental Therapy, while the other half represent existing practicing health professionals seeking more advanced skills—such as Surgeons, Neurosurgeons and Neonatal Nurses. The aggregate numbers of expected graduates per school can be found in Table 3.4.1.B

Table 3.4.1.B Expected Graduates per CMHS School

School	Expected Graduates with Intervention (2020-2030)
School of Dentistry	464
School of Health Sciences	1241
School of Medicine and Pharmacy	2572
School of Nursing and Midwifery	2236
<b>Grand Total</b>	<b>6513</b>

The program will support the launch of **two new Bachelors (A0) level training programs** in Audiology and Speech Therapy, as well as support the launch of **10 sub-specialty fellowship programs** to train sub-specialists in critically needed training and service areas. Improvements in the quality of training are anticipated through activities to upgrade the skill level of existing CMHS faculty and through academic partnerships.

At a more macro level, an initiative as bold as the National Strategy for Health Professions Development (2030) is expected to have a significant positive impact on **economic growth**. It is estimated that 2% GDP investment in health can increase overall employment rates up to 6.1%.<sup>2</sup> According to the WHO High-Level Commission on Health Employment and Economic Growth in the publication “Working for Health and Growth” (2016), over one quarter of economic growth between 2000 and 2011 in low and middle-income countries is estimated to result from the value of improvements to health. Over the ten-year duration, the National Strategy for Health Professions Development (2030) will play a major role in the country’s goal of becoming a **knowledge-based middle-income country**.

### 3.4.2 Intervention Strategies

Strengthening CMHS capacity to sustainably train prioritized cadres of health professionals at scale will be accomplished primarily through interventions in each of the 37 academic programs plus the introduction of 10 new sub-specialty fellowship training programs. These include interventions to procure necessary equipment, make critical infrastructural upgrades and develop new infrastructure as required including teaching site expansion, and ensure adequate faculty throughout the life of the program while advancing toward faculty sustainability including study abroad and visiting faculty.

Crucial strategies to **attract, train and retain Rwandan faculty** including study abroad **and** immediate hiring of Rwandan faculty—in order to achieve self-sustaining educational programs—are described below.

#### 3.4.2.1 Harmonization of Job Levels and Remuneration to Incentivize Academic Teaching

In order to establish a sustainable education system and decrease its reliance on visiting faculty members, CMHS needs to hire the necessary full-time Rwandan faculty members to staff its training programs. Many of the specialist and sub-

<sup>2</sup> WHO High-Level Commission on Health Employment and Economic Growth in the publication “Working for Health and Growth” (2016)

specialist providers required to serve as faculty in the training programs are in fact already practicing in Rwanda and often provide clinical services in the same facilities where training takes place but are not effectively supporting the training programs.

Analysis indicates that over half of the faculty gaps currently faced by programs at CMHS could be filled by existing clinicians in the country; interventions to facilitate hiring of these existing specialists and sub-specialists (across disciplines) will reduce the need to send potential faculty abroad for training or bring in visiting faculty to fill gaps, thereby reducing costs.

However, at current rates, it is difficult to attract clinicians to academic positions due to imbalances in job levels and corresponding remuneration rates. Acknowledging these challenges and the absolute necessity of attracting more faculty to achieve sustainability and scale, the strategy will pursue actions to harmonize job levels across clinical and academic positions (Table 3.4.2.B).

*Table 3.4.2.A Harmonized Clinician and Academician Levels – Medicine and Dentistry*

Current MOH Titles	UR Titles	Harmonized Levels
	Full Professor	E
Chief Consultant Doctor	Associate Professor	F
Senior Consultant Doctor	Senior Lecturer	F
Consultant Doctor	Lecturer	1.IV
Junior Consultant Doctor	Assistant Lecturer	2.III
Junior Medical Officer/GP	Tutorial Assistant	4.III

*Table 3.4.2.B Harmonized Clinician and Academician Levels - Nursing, Midwifery, and Allied Sciences Levels*

Current MOH Titles	UR Titles	Harmonized Levels
	Full Professor	E
	Associate Professor	1.IV
	Senior Lecturer	1.V
Senior Consultant Nurse/Midwife/Allied (PHD)	Lecturer	1.IV
Consultant Nurse		2.III
Junior Consultant Nurse/Midwife/Allied	Assistant Lecturer	3.II
Nurse A0/Junior Registered Nurse/Midwife/Allied with Bachelor's degree	Tutorial Assistant	4.II
Nurse A1/Midwife/Allied/Junior Registered	Clinical Instructor	7.II

Harmonization of job levels as proposed is expected to marginally increase the current CMHS wage bill for all faculty. Estimates of current and expected CMHS payroll do not include estimates for top up values, though it is expected that the precise form and value of incentives for faculty may change with revisions to the governance model for teaching hospitals and health professions education, as well as corresponding financial flows. See a summary of cost implications for current employment at CMHS in Table 3.4.2.C.

Table 3.4.2.C Summary of Cost Implications for Current Employment at CMHS (no top-ups)

	Original Levels		Harmonized Levels		Difference with Harmonization	
	RWF	USD	RWF	USD	RWF	USD
<b>Current CMHS payroll</b>	2,528,576,004	2,718,899	3,240,394,749	3,484,295	711,818,745	765,397

An inter-ministerial committee oversaw the development of the strategy and the HRH Steering Committee will ensure that harmonization and immediate faculty hiring are implemented.

### 3.4.2.2 Immediate faculty hiring (“Faculty recapture”)

In recognition of the need to aggressively increase the number of Rwandan faculty in prioritized programs and therefore reduce reliance on visiting faculty, an additional task team was convened comprised of representatives from CMHS, MOH, and professional associations. The team conducted an exercise to explore the feasibility of “recapturing” and hiring qualified providers who are currently working in Rwanda but not teaching. The team found that **34% of the current faculty gaps across the 37 targeted programs** could be addressed through recapture. Detailed costs of recapture can be found in Table 3.4.2.D.

Table 3.4.2.D Recapture Cost at Harmonized Levels (USD) Per School

School	Potential Faculty	Recapture cost at harmonized levels (USD)
<b>Medicine and Pharmacy</b>	130	2,318,358
<b>Dentistry</b>	25	263,998
<b>Nursing &amp; Midwifery</b>	30	398,406
<b>Health Sciences</b>	17	353,806
<b>Total</b>	<b>202</b>	<b>3,334,568</b>

An inter-Ministerial Steering Committee reviewed these findings and approved measures to **hire just over 200 providers as faculty**. It is assumed that this volume of providers can only be hired once harmonization of job levels and remuneration is complete (see previous section). In addition, the hiring process will include measures to screen faculty for suitability to and inclination toward teaching.

The budget implications of recapturing and immediately hiring needed faculty are outlined below (see Table.3.4.2.E). **The wage bill associated with faculty for prioritized programs will nearly double with recapture and harmonization as the institution surges its faculty numbers to rapidly make progress toward sustainability.**

Table 3.4.2.E Summary of Salary Remuneration with Harmonization Intervention

	Original Levels		Harmonized Levels		Difference with Harmonization	
	RWF	USD	RWF	USD	RWF	USD
Current CMHS payroll	2,528,576,004	2,718,899	3,240,394,749	3,484,295	711,818,745	765,397
Additional faculty with recapture	2,040,619,429	2,194,214	3,101,147,620	3,334,567	1,060,528,191	1,140,353
<b>Total</b>	<b>4,569,195,433</b>	<b>4,913,113</b>	<b>6,341,542,369</b>	<b>6,818,862</b>	<b>1,772,346,936</b>	<b>1,905,750</b>

The task team also advised on the steps necessary to operationalize this strategy. As necessary first steps:

- All health providers working at University Teaching hospitals are mandated to train, provide healthcare services; and engage in research activities.
- Role harmonization must be implemented (see above) in order to attract currently practicing clinical providers to faculty positions.
- Budget to be allocated to enable immediate hiring of additional faculty at harmonized rates.

The HRH Secretariat Steering Committee will ensure implementation of these decisions. Once these pre-conditions have been met, recruitment will begin for the needed faculty positions. This is targeted for the strategy kick-off period from February through June 2020 to ensure that maximum possible faculty are hired in time for the 2020-21 academic year.

### 3.4.2.3 Improving Quality of Undergraduate Medical Education

Special focus in this strategy has been placed on improving the quality of undergraduate medical education in order to improve the skills, knowledge, practice, and professionalism of the General Practitioners who will enter the workforce and those who will enter specialist, and subspecialist training programs. Special emphasis has been placed on the development of future faculty members through a specially designed apprenticeship program that will ensure faculty are trained to the highest standards of quality and are able to pass on those attributes to their students. Emphasis has also been placed on expanding the availability of necessary equipment and infrastructure needed for the training to maintain quality standards as enrolment expands.

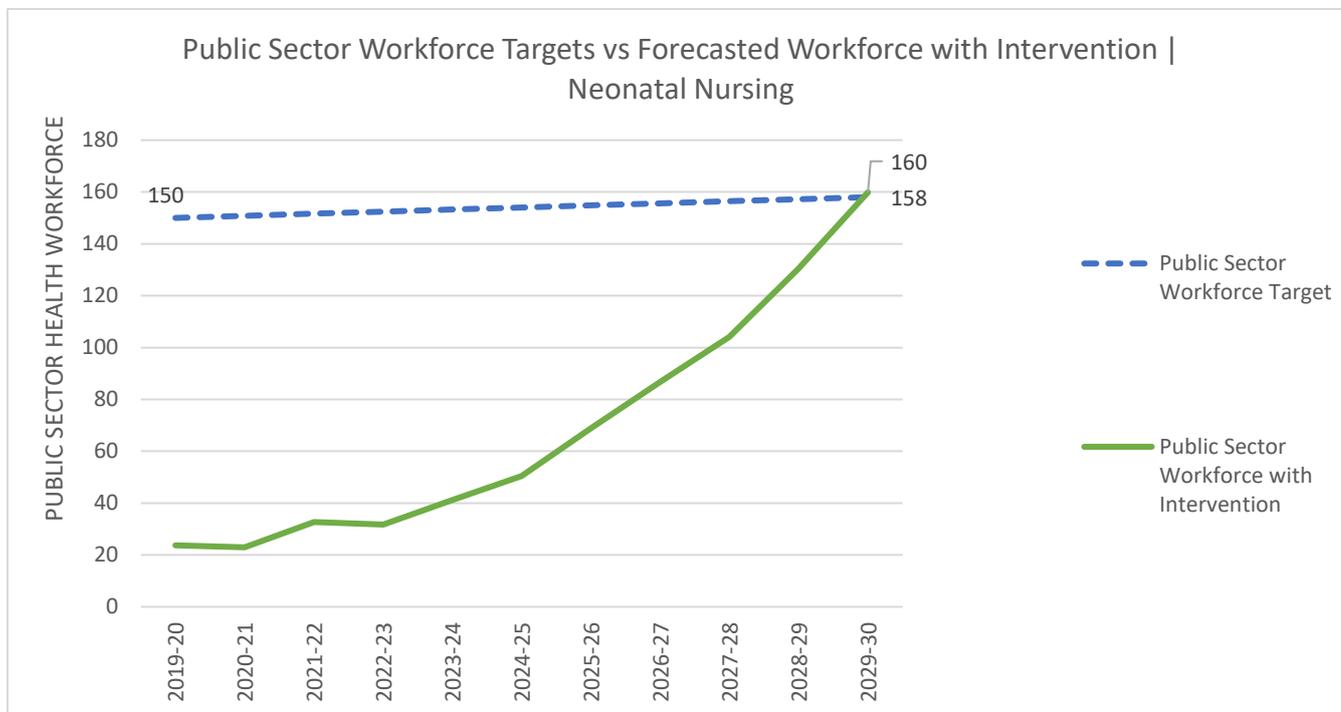
The strategy also includes interventions designed to improve the selection of candidates for entry into the undergraduate medical education training program by incorporating qualitative assessments, not just quantitative test taking, to ensure candidates are capable of becoming high-quality professionals who are likely to remain in the workforce. During their training, a new mentorship program will be implemented to enhance soft skills—such as quality improvement, professionalism, and stress management—needed for quality patient interactions, thus improving care. Evaluation methods will be implemented to assess that students are developing these important soft skills and incorporating it into their practice. Courses will also be designed for faculty to receive professionalism training, which will improve their training and enable them to pass these skills on to their students.

Regulatory bodies will also ensure that these aspects of the training program targeted at developing high-quality professionals are incorporated into the (re)accreditation process of existing and future undergraduate medical training programs.

### 3.4.2.4 Faculty development

For each of the 37 programs within scope, analyses were conducted to determine the number of trainees required to meet workforce targets, and subsequently the number of faculty required to train that volume of trainees (see Figure 3.4.2.1).

Figure 3.4.2.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Master of Nursing: Neonatal



Note: forecasted workforce figures are estimated at close of fiscal year

Strategies were then developed to determine how Rwandan faculty could be upgraded to attain the level of qualifications required to teach each program, primarily through study abroad to pursue advanced qualifications such as medical sub-specialization or PhDs.

While Rwandan faculty are studying abroad to gain necessary qualifications visiting faculty will be required to fill gaps and ensure that training can continue while delivering all necessary modular components to trainees. Where possible, volunteers including from the diaspora will be engaged for visiting faculty positions before paid visiting faculty are considered.

The HRH Secretariat Faculty Recruitment & Academic Partnerships Department will develop an operational plan for faculty recruitment that prioritizes volunteers and diaspora hires. Potential strategies include working through existing diaspora networks, and contacts of faculty already working at UR CMHS; posting adverts for volunteer positions on global health networks in targeted geographies; working with national, regional, and international associations to advertise these positions and connect with volunteer programs.

In order to ensure recruitment of quality visiting faculty who will not only train and mentor but also continue to develop the relationships with international academic institutions, ongoing and new academic partnerships will be maintained and developed. These academic partners will recruit high-quality visiting faculty capable and will provide technical support to the visiting faculty and the department at large. This will maintain and deepen many of the successful partnerships that were started and published widely about in the HRH Program 2012-2019.

#### **3.4.2.5 Teaching Site Expansion**

Interventions to enable sustainability and scale for 37 academic programs and to introduce 10 sub-specialty fellowship programs will necessarily be re-enforced by interventions to strengthen the environments in which training takes place. In addition to ensuring that each of the academic programs has the necessary equipment and fundamental space required to teach, teaching sites will overall be expanded and upgraded to accommodate expanded clinical training volumes and afford high quality training. Specifically, all referral hospitals will be upgraded to teaching hospital standards and the undergraduate medical campus at the University Teaching Hospital of Butare (CHUB) will be considerably expanded. This will complement ongoing efforts to relocate University Teaching Hospital of Kigali (CHUK) and refurbish King Faisal Hospital (KFH), as well as other hospital improvement projects being planned. Additionally, interventions include major infrastructural and equipment investments to double enrolment capacity in undergraduate medical education.

#### **3.4.2.6 Teaching Hospital Reform**

To improve the educational environment requires not just material investments to expand and upgrade teaching hospitals, but also policy reforms to transform the management and governance of these hospitals. Over the last seven years of the Rwanda HRH Program (2012-19), challenges at teaching hospitals and sites were highlighted as hospitals both rely on the Ministry of Health for service delivery functions and the University of Rwanda's College of Medicine and Health Sciences for education and research functions. Academic program leadership at the University of Rwanda's College of Medicine and Health Sciences have expressed challenges coordinating educational activities for trainees at the university teaching hospitals, including accountability for teaching, participation in academic programming, among other challenges.

Through inter-ministerial and broad institutional consultation, a plan has been initiated to introduce teaching hospital reform. The comprehensive Rwanda Teaching Hospital Reform Initiative will have as its overall goal to maximize quality and efficiency while integrating clinical, academic and research functions. A review of the existing legislative framework will be conducted to inform a new regulatory framework that will govern teaching hospitals with the aim to streamline health professional's development. In addition, all clinicians at teaching hospitals will be required to serve as faculty members. This model will eliminate the disconnect that currently characterizes clinical practice and academic activities in teaching hospitals, which in turn is expected to better incentivize clinicians toward academic careers and improve the quality of teaching, research, and service delivery. The management structures of the CMHS, teaching hospitals and teaching sites will be harmonized to reduce inefficient reporting lines and ensure that academic, service and research needs are effectively balanced.

#### **3.4.2.7 Improving Quality: Institutional Strengthening for Health Professions Governance and Regulation**

To ensure continuous improvement of the quality of health workforce and health professional training, the HRH Secretariat will collaborate with regulatory bodies in charge of education as well as health professional regulation to reinforce implementation of appropriate quality standards and culture of professionalism and ethics; increase professional knowledge and competencies by streamlining continuous professional development; and work with health professional regulatory institutions in charge of regulating education to improve the standards and quality of teaching.

### **3.4.3 Program Management & Governance**

A Human Resources for Health Secretariat will manage this bold and broad initiative. The Human Resources for Health Secretariat will be led by the Office of the Executive Secretary. The Human Resource for Health Secretariat fulfils its responsibilities under the supervision of the Ministry of Health. The Office of the Executive Secretary will report to a Steering Committee to ensure necessary coordination across sectors and key institutions. The following departments will report into the Office of the Executive Secretary: Teaching Coordination & Quality Assurance Department; and Faculty Recruitment & Academic Partnerships Department.

### 3.4.4 Monitoring & Evaluation

Monitoring and evaluation (M&E) activities will be implemented to ensure that the program remains on track to achieve its targeted outputs and outcomes. Routine monitoring will track primarily quantitative output and outcome indicators, while mixed-methods and qualitative studies will be employed to examine outcomes related to quality of training and quality and organization of care in teaching sites. During annual reviews, routine monitoring data will be presented to and reviewed by the Steering Committee to assess progress against training trajectories and course correct program design and processes as needed.

In addition to annual program reviews, a comprehensive mid-term review is proposed to not only assess progress toward targets but to examine whether the program is moving toward the *right* targets—a necessary step for a long-term health systems strengthening initiative that takes place in a dynamic service delivery environment with changing population needs. A series of applied studies—including a Workload Indicators of Staffing Need (WISN) analysis and health labor market analysis—is proposed in advance of the mid-term review so that the review may examine and revise as necessary programmatic targets based on an assessment of service provision goals and health system demand.

There will be several layers of evaluation, including baseline, midline and end line evaluations; a targeted implementation research evaluation to assess the results of teaching hospital reform; and process evaluation in the second year of the program to ensure that program implementation structures and processes are serving the program’s overall goals. A micro-evaluation fund will be established to create a pot of applied research funding for research that explores results of program activities—increased hiring of Rwandan faculty, increased qualifications of Rwandan faculty, teaching hospital reform, and infrastructure and equipment upgrades—on the quality of teaching, access to care and clinical outcomes. Rwandan faculty and partners will be eligible to access this funding, which will contribute to a deeper understanding of the many layers of results achieved through the program.

Finally, the health professional councils will improve their information system to track health professionals from the point of entry into pre-service training through deployment. This will not only empower the councils to effectively manage re-licensure of health professionals but will also provide a powerful database for monitoring the results of the program and strengthening overall health workforce planning and management.

### 3.4.5 Program Costs

Investment costs are organized into four thematic areas—policy actions to implement teaching hospital reform; faculty recapture and job levels harmonization; the expansion of teaching sites; and interventions to address professionalism and quality—as well as investments by academic program for each of the 37 academic programs plus 10 new sub-specialty fellowship programs. Interventions by academic program include targeted infrastructure and equipment investments by service delivery cluster and program; and study abroad, visiting faculty and academic partnerships to develop Rwandan faculty and ensure immediate high quality of training as institutional capacity is built. Equipment is the biggest driver of costs by academic program, followed by visiting faculty and infrastructure.

Investment costs for the program are currently estimated at up to **USD 274M**. Investments across the ten-year strategy timeframe are significantly frontloaded, with 90% of costs occurring in the first five years of the program. Around 46% of total investment costs are for infrastructure and equipment, including expanding and upgrading the required clinical teaching sites (i.e. hospitals) to enable high quality training and significantly expanding the undergraduate medical school campus to accommodate doubling enrollment from 100 to 200 students per annum.

In the strategy, total costs to realize program strategies have been provided, agnostic to potential budget source; some of these costs may be covered by ongoing or planned investments by the Government of Rwanda, such as improvements to teaching hospitals or other budget commitments, with complementary investments from other sources. At present the Government of Rwanda contributes roughly USD 12M to health sector infrastructure, and this is expected to grow 10% per year. At this rate, over the ten-year strategy period the government may expect to

contribute over USD 31M to infrastructure investments which may be shaped against the needs defined in this strategy.

A total of 476 visiting faculty full time equivalents (FTEs) are estimated as needed across the 37 academic programs over ten years. Visiting faculty will teach, train, and mentor health professionals while Rwanda faculty are sent abroad to gain the advanced qualifications that they need to deliver high quality training programs. Visiting faculty costs are estimated under two scenarios. In the optimal low-cost scenario, the majority of visiting faculty are recruited at volunteer and local remuneration rates, with paid visiting faculty accounting for only a third of total visiting faculty deployed. For conservative budgeting purposes, a second scenario estimates total visiting faculty needs at paid rates. Costs for academic partners are included to provide technical assistance to developing academic programs and recruit and deploy visiting faculty. Academic partners will be secured in the launch phase of the project.

To sustain the program and its results, estimated Government of Rwanda costs include costs to remunerate the expanded workforce, more than double current faculty numbers for targeted programs, and cover salary for all public sector trainees.

Currently the MOH total wage bill is estimated at USD 50M with an expectation of 10% growth each year; at this rate the total 2030 wage bill is forecasted to reach about USD 129M by 2030. The costing exercise has indicated that the associated wage bill growth is within a reasonable share of the overall forecasted wage bill. The M&E plan for the program proposes that a health labor market analysis be conducted ahead of the mid-term review to ensure that targets are assessed and potentially revised in view of financial feasibility.

Full estimated strategy costing details are available from the HRH Secretariat upon request.

## 4 INTRODUCTION

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### 4.1 OVERVIEW

Since completing its first sectoral strategic plan in 2005 with the publication of the Health Sector Policy, Rwanda has made significant progress in health outcomes, especially in primary care. According to the World Bank, average life expectancy rose from 54 years in 2004 to 68 years in 2017.<sup>3</sup> As of 2015, the maternal mortality ratio (MMR) was 210 per 100,000 live births down about 72% from an MMR of 750 in 2005. The Demographic and Health Survey shows that by 2015, 91% of births were assisted by a skilled health provider, up from 39% in 2005. Moreover, vaccination coverage among children ages 12-23 months who received all antigens given in the country rose from 75% in 2005 to 93% in 2015. As a result, under-5 mortality dropped from 152 deaths per 1,000 live births in 2005 to 50 deaths per 1,000 live births in 2015.

Health workers are the backbone of a health system, and investments in the health workforce—including the establishment of the Community Health Program in 1995—alongside the establishment of a community-based health insurance program are part of the reason Rwanda made such strides in primary healthcare outcomes.

Building on these successes, in 2011, MOH recognized the need to continue expanding access to high quality services—including secondary and tertiary care services—for its population by building out the capabilities of its health workforce. MOH sought to achieve this through an initiative that would specialize physicians, advance the skill level of nurses and midwives, expand training for oral health professionals and introduce a cadre of health managers. The Rwanda HRH Program was initiated in 2012 as a commitment to build the health education infrastructure and workforce necessary to create a high quality, sustainable healthcare system in Rwanda.

The 7-year HRH Program has been highly successful in terms of increasing production output and expanding and upgrading Rwanda's health workforce. As MOH looks ahead to a shifting disease burden and wanting to build off of the significant gains they have made in terms of primary healthcare and after the first HRH Program, they have identified a set of next steps toward the Health Sector Strategic Plan 2018-24 (HSSP 4) strategic goal of having a qualified, competent, motivated and equitably distributed health workforce that is able to deliver quality health services.

This proposal outlines strategies to make progress toward these twin goals by strengthening the capacity of domestic institutions to train competent and qualified health professionals who will expand the availability and quality of care provided to the population. Importantly, the strategy emphasizes several key principles that differentiate it from its predecessor:

1. **Educational sustainability** – The program places an explicit focus on planning for the steps required to establish full domestic training capabilities for the targeted programs. This includes plans to develop, attract and retain Rwandan faculty with advanced qualifications.
2. **Educational environment** – In addition to addressing the key inputs to educational programs—faculty, equipment and infrastructure—required for individual academic programs, the strategy also provides for enhancing the general context within which training takes place. This is achieved through reforms to the governance and management structures of teaching institutions including teaching hospitals and universities, as well as to overall infrastructural upgrades.
3. **Professionalism and quality** – Strategies are proposed to ensure that practicing providers are delivering high quality of care with adherence to principles of professionalism and ethics. This is addressed through

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<sup>3</sup> The World Bank. Life expectancy at birth, total (years) – Rwanda. (accessed 8 July 2020)  
<https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=RW>

interventions across the lifecycle of health workers, including pre-selection, pre-service training strategies, and in-service support and regulation mechanisms in facilities and through health professional councils.

With these principles and interventions, the strategy aims to sustainably scale high quality training in Rwanda, thereby contributing to increased availability and coverage of high-quality services at primary, secondary and tertiary levels.

## 4.2 PURPOSE AND STRUCTURE OF PROPOSAL DOCUMENT

The purpose of this strategy is to extend and expand upon the efforts and successes that resulted from the Rwanda HRH (2012-19) program. Looking forward to the next 10 years, this re-envisioned strategic plan is designed to continue to expand Rwanda's capacity to domestically train key cadres of health workers, as well as outline all the necessary steps and resources to realize the overall vision to continuously grow the national health workforce.

This document contextualizes the National Strategy for Health Professions Development (2030) by analyzing progress achieved through the Rwanda HRH program, while reflecting on key successes and challenges previously experienced. The Methods section describes the intervention design and development process in detail, including how analytical tools and stakeholder consultation were utilized to inform workforce target setting, planning for training scale-up, and workforce costing.

Policy and planning interventions are described to ensure that advancements made through the program strategy are institutionalized in policies and structures to support effective workforce planning and management.

To strengthen pre-service training, strategies begin with interventions to improve the overall environment within which training takes place. This includes structural reforms to the governance and management of training institutions and sites; including an expansion of teaching sites.

For the purposes of strategy development – and to ensure that workforce scale-up planning was anchored in a vision for expanding services and deploying teams of service providers across levels of the health system – cadres are organized into ten service area clusters:

- Women and Children's Health
- Emergency Medicine
- Oral Health
- Non-Communicable Diseases
- Surgery/Anesthesia
- Mental Health
- Diagnostics and Support
- Sensory Services
- Leadership and Management
- Undergraduate Medical Education

Within these ten service area clusters, interventions were designed for **37** unique academic programs as well as 10 sub-specialty fellowship training programs:

Table.4.2.A: National Strategy for Health Professions Development (2030) | Programs in Scope

Program*
<b>Women and Children’s Health</b>
Midwifery (A1)
Midwifery A0)
Master of Midwifery
Master of Nursing: Pediatrics
Master of Nursing: Neonatal
Physician: Obstetrics & Gynecology
Physician: Pediatrics
<b>Medicine and Non-Communicable Diseases*</b>
Master of Nursing: Nephrology
Physician: Internal Medicine
Master of Nursing: Oncology
<b>Emergency Medicine</b>
Master of Nursing: Critical Care/Trauma
Physician: Emergency Medicine
<b>Surgery/Anesthesia*</b>
Non-Physician Anesthetist (A0)
Master of Nursing: Medical Surgical
Master of Nursing: Perioperative
Physician: Anesthesiology
Physician: Otorhinolaryngology (ENT)
Physician: Surgery-General
Physician: Surgery-Neuro
Physician: Surgery-Orthopedic
Physician: Surgery-Urology
<b>Mental Health*</b>
Physician: Psychiatry
<b>Diagnostics and Support Services*</b>
Biomedical Laboratory Scientist (A0)
Physician: Pathology
Physician: Radiology
<b>Oral Health</b>
Dental Therapy (A0)
Dental Surgery (A0)
<b>Sensory Services</b>
Audiology (A0)
Speech Therapy (A0)
Physician: Ophthalmology
<b>Leadership and Management</b>
Nurse: Education, Leadership, and Management
Master of Hospital and Healthcare Administration
<b>Undergraduate Medical Education</b>
Undergraduate Medical Education

\*Prioritized cadres for which interventions have not yet been designed (four out of 37 prioritized cadres) include: Biomedical Engineers, Mental Health Nursing, Perfusion Therapy, and Occupational Therapy

Cluster objectives and workforce targets are outlined. For each academic program, workforce objectives and corresponding training targets are identified. Subsequently, faculty interventions, and equipment and infrastructure interventions are described to reach these objectives.

Following all implementation strategies, program management and governance are described. This includes the proposed management structure, systems for academic partnerships and visiting faculty, and a monitoring and evaluation (M&E) plan.

## 5 SITUATIONAL ANALYSIS

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The National Strategy for Transformation 1 (NST 1) emphasizes increasing the number, capacity, and quality of specialized health personnel and improving the quality of health care as a focus of health policy. The 2015 Rwanda Health Sector Policy indicates that at the time, 24% of the total number of practicing physicians in Rwanda are specialized. These specialists—including those who work in the private sector—are predominately located around Kigali, whereas 76% of general practitioners are distributed amongst district hospitals in rural areas. Although the objective is to have a significant base of health workers with master's degrees working across the health sector, the opportunity for continuous learning for health professionals is low. In addition, pipeline analysis completed in 2019 indicates that many training programs are chronically under-enrolled and at current rates will not reach the workforce vision set by MOH.

### 5.1 RESULTS SUMMARY OF RWANDA HRH PROGRAM (2012 – 2019)

#### 5.1.1 Background

In 2012 the Government of Rwanda launched the Human Resources for Health (HRH) Program—a seven-year initiative that set out to build the health education infrastructure and health workforce necessary to create a high quality, sustainable healthcare system in Rwanda. The program specifically sought to:

- Increase the number of specialized physicians in the public sector
- Advance the skill level of nurses and midwives in the public sector
- Introduce the role of 'health manager' into the public sector health system
- Launch the School of Dentistry
- Build the capacity of the College of Medicine and Health Sciences (CMHS) at University of Rwanda and clinical teaching sites in order to sustain high quality education

#### 5.1.2 Funding & Government of Rwanda financial contribution

Through high level advocacy between the Government of Rwanda, US Government, and the Global Fund, MOH was able to secure significant funding against this broad-sweeping health workforce initiative. At the Government of Rwanda's direction, donor funds were mobilized from vertical programs to fund a cross-cutting national health system priority, signaling an important paradigm shift toward increased government management of external resources and alignment with national health priorities.

Ultimately, just under USD 100M was committed to the HRH Program by PEPFAR (through the CDC) and the Global Fund. PEPFAR funding ended two years earlier than expected in 2017, contributing to a slow-down in program activities. However, the Government of Rwanda stepped in and provided budget allocations of approximately USD ~1.2M to fill the immediate gap in funds needed to recruit visiting faculty over the last two years of the program. This was in addition to considerable ongoing investments made by the Government of Rwanda to pay tuition for postgraduate trainees and absorb a dramatically increased wage bill for the almost 5,000 additional health workers who joined the public sector health workforce.

These figures are a fraction of the total financial contributions made by the Government of Rwanda to supporting and sustaining the impact of the program. Government of Rwanda bore additional indirect costs—such as equipment procurement, costs of supporting and scaling the undergraduate student pipeline, and costs associated with increased service caseload—that, though unquantified, were critical to sustaining the program and its results.

In order to start transitioning away from reliance on visiting faculty and build the capacity of College of Medicine and Health Sciences to sustain high quality and high volume training, University of Rwanda hired an additional 68 Rwandan faculty across four schools over the seven years, resulting in an estimated additional salary obligation of USD ~78,500 (RWF 72.5M) for University of Rwanda over the course of the program.

### 5.1.3 Academic Partnerships & Visiting Faculty

In order to achieve the program’s objectives and dramatically increase training capacity at University of Rwanda, the Ministry of Health and University of Rwanda partnered with international academic institutions to provide significant numbers of visiting faculty. Visiting faculty were expected to increase overall training capacity at University of Rwanda, assist in the design and launch of new pre-service training programs with their Rwandan counterparts, and plug gaps while select Rwandan faculty were sent abroad or trained in-country at the level required to teach.

Over the course of the program 25 US academic institutions engaged to deploy over 600 faculty to Rwanda, many of whom stayed for more than six months at a time. Academic partners were contracted with no overhead fees and only 7% administrative rates, representing a significant change from high-overhead and uncoordinated academic partnerships of the past.

### 5.1.4 Top Line Results

By the end of the program in mid-2019, the Government of Rwanda has achieved incredible results. Compared to 2011 there are now more than two times as many medical specialists, more than four times as many Bachelors-level (AO) nurses and midwives, and more than six times as many Masters-level nurses in the public health sector. The School of Dentistry has launched and is training Dental Therapists and Dental Surgeons.

These results were made possible through investments and activities that significantly expanded the capacity of University of Rwanda to train the graduates needed for the public sector health workforce. During the program a total of 28 training programs across four schools at the College of Medicine and Health Sciences were supported by HRH Program interventions, resulting in 2.5 times as many graduates across prioritized programs compared to before the program. Over the course of the seven years, 4,357 graduates from the total 28 programs were supported by HRH Program interventions.

These investments yielded significant improvements in the availability of qualified health workforce. Specifically:

- The doctor per population ratio improved from 1 doctor/16,001 people in 2010 to 1/8,919 in 2018.
- The numbers of Rwandan specialists in country increased from 94 in 2009 to 436 in 2018.
- The nurse per population ratio improved from 1 nurse/1,291 people in 2010 to 1/1,094 in 2017, with overall significant shifts in the skill level of the nursing population.
- The midwife per population ratio improved dramatically from 1 midwife /66,749 people in 2010 to 1/4,064 in 2017.

#### **5.1.4.1 Successes**

In 2019 as the program came to an end the Ministry of Health conducted a rapid review of the results of the program. The review found that the program was overall successful in dramatically increasing the production capacity of University of Rwanda to train prioritized cadres, and therefore in making major contributions to the number of health workers from prioritized cadres in the public sector. Compared to 2011 there are now more than two times as many medical specialists, more than four times as many bachelor's level (A0) nurses, and more than six times as many master's level nurses in the public health sector. The School of Dentistry has launched and is training Dental Therapists and Dental Surgeons.

These results were made possible through investments and activities that significantly expanded the capacity of University of Rwanda to train the graduates needed for the public sector health workforce.

During the program, 4,357 health workers graduated from the total 28 programs that were supported by HRH Program interventions. As a result of program investments and activities 17 new training programs were introduced at the University of Rwanda: Masters of Medicine in Emergency, Neurosurgery, Orthopedic Surgery, Pathology, Psychiatry, Urology, and Radiology; Bachelor of Science in Midwifery; Masters of Science in Nursing in Medical Surgical Nursing, Neonatal Nursing, Nephrology Nursing, Nursing Education, Leadership and Management, Oncology Nursing, Pediatric Nursing, and Perioperative Nursing; Bachelors of Science in Dental Surgery; and Masters of Hospital and Healthcare Administration. Each of the programs is the only of its kind offered in Rwanda, and in some cases in the region. Rwanda now offers more disciplines of nurse specialist training than any other country in Sub-Saharan Africa other than South Africa.

#### **5.1.4.2 Challenges**

Although the Rwanda HRH Program (2012 – 2019) has been an overall success and has made transformative change in the country's health workforce, some areas of the program fell short of their original objectives. For example, MOH and College of Medicine and Health Sciences report that enrollment in specialist training programs reduced significantly in response to the withdrawal of funding by PEPFAR in 2017, two years earlier than expected. In addition, Master of Medicine training programs at the College of Medicine and Health Science's School of Medicine and Pharmacy such as Anesthesiology, Pediatrics, Surgery and Radiology were significantly under-enrolled as compared to enrollment targets indicated in the program proposal. However, despite enrollment challenges and the impact of funding withdrawal, forecasting indicates that the School of Medicine and Pharmacy will eventually reach this target in 2022.

#### **5.1.5 Lessons learned for National Strategy for Health Professions Development (2030)**

Experience from the first Rwanda HRH Program highlights several crucial learnings that will inform the National Strategy for Health Professions Development (2030) strategy.

##### **5.1.5.1 Enrollment & Training Demand**

Analysis of actual training program enrollment during the Rwanda HRH Program (2012 – 2019) compared to the program's enrollment targets reveals that several postgraduate medical training programs were under-enrolled compared to expectations. To mitigate for a similar risk, additional analysis will be conducted at the start of the National Strategy for Health Professions Development (2030) program to estimate the general practitioner training volume at University of Rwanda that is required to ensure adequate distribution of general practitioners into clinical placements and a sufficient flow of postgraduate training candidates back into University of Rwanda. This analysis will factor in a recently instituted policy required general practitioners to complete a two-year District Hospital service requirement prior to applying for postgraduate training.

Additionally, commitments by Ministry of Health and University of Rwanda to guarantee tuition support (see Policy Intervention 2: Training sponsorship) will facilitate demand for training.

### *5.1.5.2 Reliance on External Funding and Visiting Faculty*

While the Rwanda HRH Program achieved impressive and large-scale results, not all academic training programs supported by the program were able to establish sustainability, largely because they were unable to generate and retain the full extent of appropriately qualified University of Rwanda faculty to deliver the program at quality standards, and therefore remained reliant on visiting faculty. This is evidenced by, among other things, a slowdown in enrollment in select postgraduate training programs as visiting faculty numbers reduced.

In order to establish a sustainable education system and decrease its reliance on visiting faculty members, the University of Rwanda College of Medicine and Health Sciences needs to hire the necessary full-time Rwandan faculty members to staff its training programs.

The program leads of prioritized training programs have identified necessary faculty members needed for their training programs and have begun to identify how many are already available in Rwanda to be hired as faculty. The task team is to build from this work to inform a final, realistic number of individuals who could immediately be hired in order to relieve faculty gaps.

### *5.1.5.3 Service Readiness*

Finally, findings regarding the distribution of oral health professionals—as well as the situation analysis presented in the draft National Oral Health Strategic Plan 2019-24—highlight that a lack of necessary equipment at clinical sites was a driver behind low absorption rates for oral health professionals (exacerbated by private sector attrition due to high private sector remuneration). This serves as a reminder that efforts to scale-up health workforce must be aligned with efforts to address other aspects of service readiness—including infrastructure and equipment—to ensure that increased numbers of health workers are absorbed and able to be effective in clinical service provision. For the National Strategy for Health Professions Development (2030) the need to ensure complementary health systems strengthening efforts in addition to workforce deployment is highlighted as a condition for success (See section 6.4.1).

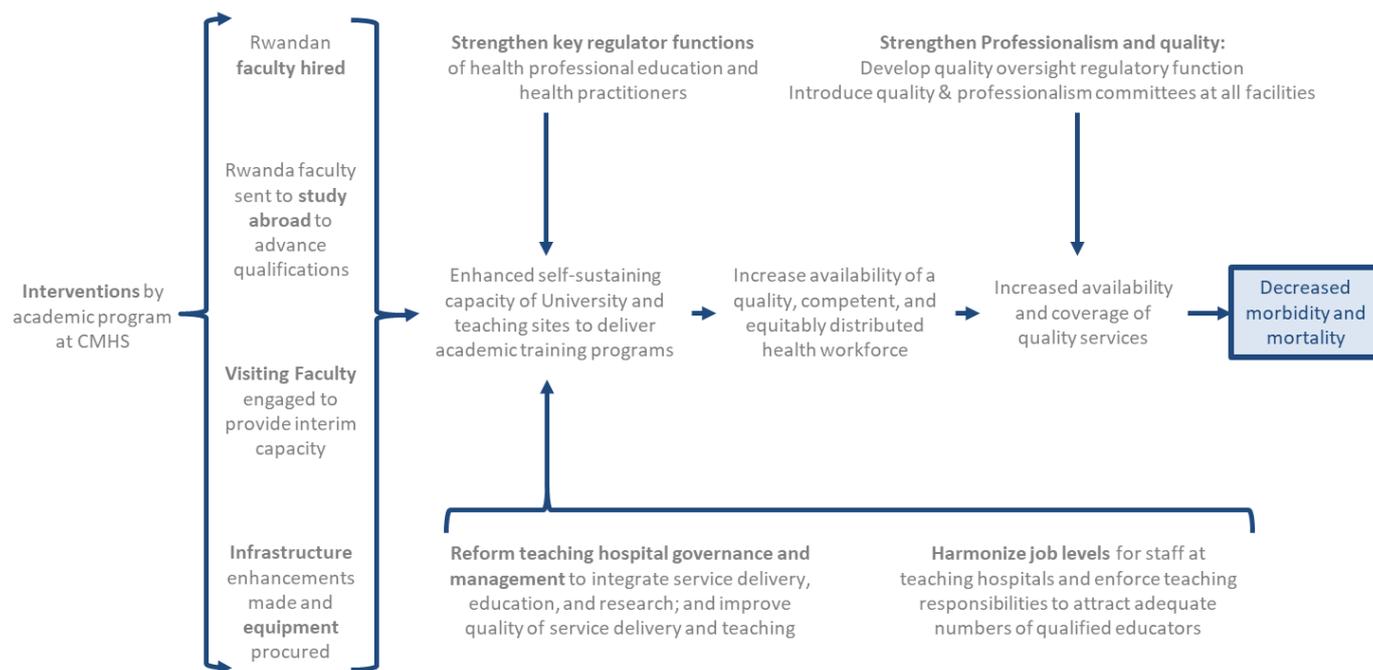
## **6 OVERALL PROGRAM STRATEGY**

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### **6.1 THEORY OF CHANGE**

The overall goal of the National Strategy for Health Professions Development (2030) is to contribute to a substantial increase in the availability and coverage of high-quality services across Rwanda by improving the availability of a qualified, competent and equitably distributed health workforce. The strategies are premised on the observation that Rwanda's ability to achieve its health workforce goals is significantly constrained by the capacity of its public educational institution (College of Medicine and Health Sciences [CMHS] at University of Rwanda [UR]) to train adequate numbers of some specific cadres of health providers needed to meet health service demand and MOH service provision objectives, and that capacity at CMHS in turn is constrained specifically by insufficient qualified faculty and select equipment and infrastructural inputs to enable high quality training at scale. The strategy also acknowledges material and structural constraints related to the teaching environment and the need to strengthen key institutions, including teaching hospitals, health professions councils, and national and facility level systems for health workforce management and regulation.

Figure 6.1.1 Interventions by Academic Programs – Theory of Change



To tackle these challenges, the National Strategy for Health Professions Development (2030) aims to scale pre-service training as required for 37 prioritized academic training programs in order to progress toward specified public sector health workforce targets that will contribute to a more available, qualified, and equitably distributed public health sector workforce. In so doing, over the course of ten years, 6513 health care professionals will graduate from the 37 supported programs. Almost half of these will be new health professionals from direct entry programs such as Biomedical Lab Sciences or Dental Therapy, while the other half represent health professionals seeking more advanced skills—such as Surgeons, Neurosurgeons and Neonatal Nurses.

Table 6.1.B Estimated Impact of National Strategy for Health Professions Development by School

School	Expected Graduates with Intervention (2020-2030)
School of Dentistry	464
School of Health Sciences	1241
School of Medicine and Pharmacy	2572
School of Nursing and Midwifery	2236
<b>Grand Total</b>	<b>6513</b>

The program will support the launch of two new Bachelors (A0) level training programs in Audiology and Speech Therapy, as well as support the launch of 10 sub-specialty fellowship programs to train sub-specialists in critically needed specialty service areas.

Strengthening CMHS capacity to sustainably train prioritized cadres of health professionals at scale will be accomplished primarily through interventions in each of the 37 academic programs plus 10 sub-specialty fellowship training programs, including interventions to procure necessary equipment, make necessary infrastructural upgrades and develop new infrastructure as required, and to generate and retain required faculty. At the start of the plan an immediate hiring plan will be implemented to hire those potential faculty who are currently available in country; this

will be made possible by urgent policy action to harmonize job levels to attract qualified professionals to academic careers.

These interventions are complemented by activities to strengthen the educational environment, including actions to reform teaching hospital governance, management and reforming the teaching hospital structure to integrate service delivery, education and research. The relevance of appropriate legislative, regulatory and administrative reform will be assessed in order to implement changes that will allow a smooth implementation of the NSHPD. Teaching sites will be expanded and upgraded to ensure that the system is set up to support expanded clinical training volume.

Key institutions will need to be strengthened to ensure quality of training as well as to continue to appropriately regulate and support health professions after training. Interventions are described to re-enforce the Health Educations Council, establish Rwanda Health Professions Council, and develop structures to support professionalism and quality of care by providers at multiple levels.

## 6.2 ALIGNMENT WITH NATIONAL POLICIES, STRATEGIES AND OBJECTIVES

### 6.2.1 National Strategy and Policy Alignment

Policies, strategies, and objectives from the international, national, and Ministry of Health levels align with the key objectives and strategies of the National Strategy for Health Professions Development (2030).

The 7 Years Government Program: National Strategy for Transformation 1 (NST1) 2017–2024 focuses on enhancing demographic dividend through ensuring access to quality health for all in Priority Area 3: Social Transformation. Among the key interventions is “increasing the number and capacity of human resources for health including general practitioners, specialists, nurses, midwives and qualified administrators.”

The National Strategy for Health Professions Development (2030) will contribute to these objectives through strategies to scale undergraduate medical education, strengthen specialty training for 37 specialty programs and introducing 10 sub-specialty training programs. The program does not explicitly address increasing the number of nurses in the country but will significantly increase the skill level of the nursing workforce by scaling enrolment in Masters-level specialty nurse training. This is expected to both improve quality of care provided at Provincial and Referral hospitals as well as increase the available pool of qualified faculty for nurse training programs at A0 level and below.

The Ministry of Health Fourth Health Sector Strategic Plan (HSSP IV) and Health Sector Policy (2015) address strengthening health system resources and management, effective governance of the sector through human resources for health, and the critical role HRH plays to achieve Universal Health Coverage (UHC). HSSP IV was developed to highlight priorities across the healthcare sector over a 6-year period from 2018 – 2024. This includes ensuring universal access to equitable and affordable quality health services for all Rwandans. HSSP IV focuses on program implementation to improve the demand, access, coverage, and quality of services, which parallels the vision of the National Strategy for Health Professions Development proposal. Additionally, the HSSP IV prioritizes strengthening health system resources and management and effective governance of the sector (decentralization, partnerships, coordination, and effective financial management).

The National Strategy for Health Professions Development (2030) targets this challenge directly through training programs to advance the skill level of existing health workers as well as direct entry programs for providers characterized by a significant shortage, but also by building the health workforce planning and development functionality of MOH and by introducing interventions such as teaching hospital governance reform and increased production of Masters-trained Health Managers that will improve management of the health workforce. The establishment of a Secretariat to manage the strategy and ensure HRH development to respond to national needs, will provide a platform for more effective coordination of partnerships and resources as relates to health workforce training.

Finally, by emphasizing human capacity development the National Strategy for Health Professions Development (2030) supports the aspirations laid out by the African Union Agenda 2063 to sustainably develop a united, people-driven, inclusive Africa. The African Union Agenda 2063: The Africa We Want outlines “a prosperous Africa based on inclusive growth and sustainable development” in Aspiration 1, an “Africa whose development is people-driven” in Aspiration 6, and “Africa as a strong, united and influential global player and partner” in Aspiration 7. The goal that by 2063, African countries will be amongst the best performers in global quality of life measures” will be attained through strategies which include provision of quality healthcare through a strong healthcare workforce. This vision includes eradicating poverty in one generation and creating a prosperous Africa through social and economic transformation.

Establishing universal healthcare and systems for individuals to easily access affordable, quality care is a baseline component to build cross-continental social and economic transformation. The return on investment in Universal Health Coverage (UHC) is tenfold and increases workforce vibrancy across all sectors; by lifting the burden of disease, men and women of all ages – whether active members of the workforce or students – have the capacity to engage in building the nation’s economy through participation.

### 6.2.2 Accelerating Progress toward UHC

As outlined across current national health policies and interventions – including Rwanda’s Vision 2020 and Health Sector Policy (2015) – the drive towards achieving Universal Health Coverage is of national high priority. Because many specialists (across all disciplines) are based around Kigali, most of the population is significantly limited in terms of the care they can access and afford. Universal Health Coverage demands all Rwandans can access the care they need, when they need it. This includes citizens living in rural geographies and those who are financially limited.

The Universal Health Coverage agenda also demands that health services are delivered at a high quality. This requires investing in upgrading staff skill levels at health centers, district hospitals and provincial hospitals—where the majority of the population receives care. The norm-setting and target-setting exercise that were part of this strategy development process provide for the extension of specialist providers down to these levels to bring advanced care closer to the population.

### 6.2.3 Returns on Program Investment

Investing in human resources for health has a significant positive impact on economic growth. This is due in part to the multiplier effect: each employee in a health occupation is supported by one or two other workers such as people working in administration, food and beverage, information technology, and transportation. It is estimated that 2% GDP investment in health could increase overall employment rates up to 6.1%.<sup>4</sup>

In addition, investing in expanding the health workforce has indirect but significant impacts on population health by expanding availability of high-quality services. According to the WHO High-Level Commission on Health Employment and Economic Growth in the publication “Working for Health and Growth” (2016), over one quarter of economic growth between 2000 and 2011 in low and middle-income countries is estimated to result from the value of improvements to health. One extra year of life expectancy can raise GDP per capita by about 4% and, in countries with high fertility rates, decreased child mortality can positively inspire families to practice family planning.<sup>5</sup> This can lead to a faster demographic transition (fewer children per household), which leads to associated economic benefits (a “demographic dividend”).

When a country has a robust health system, the population is healthier. This leads to improved labor supply and workforce-wide productivity. Economic outputs increase, which leads to the diversification of services, goods, and capital assets. Over time this catalyzes economic growth and social development (reduced inequality, increased

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<sup>4</sup> WHO High-Level Commission on Health Employment and Economic Growth in the publication “Working for Health and Growth” (2016)

<sup>5</sup> WHO High-Level Commission on Health Employment and Economic Growth in the publication “Working for Health and Growth” (2016)

political stability, innovation, health security). With this in mind, global demand for health workers is expected to rise with an additional 40 million new jobs created by 2030, particularly in low- and middle-income countries.

The National Strategy for Health Professions Development (2030) proposes a significant increase in the skill level of the health workforce. Skill advancement for health providers will not only greatly impact the quality of services available but will provide an economic boost in the public sector, both through broader gains in employment and indirect gains in overall workforce productivity in Rwanda. Over the ten-year duration, the National Strategy for Health Professions Development (2030) will play a major role in the country's goal of becoming a knowledge-based middle-income country.

#### 6.2.4 Additional Benefits

Investing in the health workforce has benefits beyond leading to economic growth. Among these additional benefits are improving gender equality and strengthening public health systems, like ability to effectively respond to health emergencies. Because the health sector employs many women (particularly in fields such as Midwifery and Nursing), the expected benefits of employment and career advancement are extended. According to the WHO's "Working for Health and Growth" publication, women are now the main providers of care when considering health systems in aggregate across the world. When a country invests in building a robust health workforce, it is better equipped to detect and effectively respond to public health risks and emergencies. Having the personal to manage and resolve disasters makes the economy less vulnerable to unprecedented circumstances.

### 6.3 HEALTH WORKFORCE TARGETS

#### 6.3.1 Targets

The strategy is anchored against public sector health workforce targets that will contribute to a more available, qualified, and equitably distributed public health sector workforce. These national health workforce targets for 2030 are based on facility-level staffing norms that were developed by MOH to ensure that this pre-service strengthening strategy makes strides toward a long-term vision for its health workforce. In some cases, the program aims to achieve 100% of the 2030 public sector health workforce target; in other cases, the program will achieve a share of the overall target due to limitations in the pace at which enrolment can reasonably be scaled. The MOH-set targets and the program's contribution targets are listed in Table 6.3.1.A. The norms that produced the MOH targets are outlined in each distinct intervention strategy section.

Table 6.3.1.A. National Health Workforce 2030 and Program Contribution Targets

Program*	National Health Workforce Target 2030	Forecasted Workforce 2030 with Proposed NSHPD Interventions	% National Health Workforce Target 2030 NSHPD Aims to Achieve
<b>Women and Children's Health</b>			
Midwifery (A1)	2621	1176	45%
Midwifery A0)	1030	368	36%
Master of Midwifery	39	47	121%
Master of Nursing: Pediatrics	173	139	80%
Master of Nursing: Neonatal	158	160	101%
Physician: Obstetrics & Gynecology	270	131	49%
Physician: Pediatrics	239	148	62%
<b>Medicine and Non-Communicable Diseases*</b>			
Master of Nursing: Nephrology	38	38	100%
Physician: Internal Medicine	186	170	95%
Master of Nursing: Oncology	84	84	100%
<b>Emergency Medicine</b>			
Master of Nursing: Critical Care/Trauma	336	206	61%
Physician: Emergency Medicine	74	65	88%
<b>Surgery/Anesthesia*</b>			
Non-Physician Anesthetist (A0)	556	557	101%
Master of Nursing: Medical Surgical	302	214	71%
Master of Nursing: Perioperative	254	172	68%
Physician: Anesthesiology	162	135	83%
Physician: Otorhinolaryngology (ENT)	124	59	48%
Physician: Surgery-General	140	103	73%
Physician: Surgery-Neuro	30	10	33%
Physician: Surgery-Orthopedic	60	60	100%
Physician: Surgery-Urology	38	20	53%
<b>Mental Health*</b>			
Physician: Psychiatry	44	39	89%
<b>Diagnostics and Support Services*</b>			
Biomedical Laboratory Scientist (A0)	826	670	81%
Physician: Pathology	54	52	96%
Physician: Radiology	54	37	69%
<b>Oral Health</b>			
Dental Therapy (A0)	1244	261	21%
Dental Surgery (A0)	124	143	115%
<b>Sensory Services</b>			
Audiology (A0)	121	64	53%
Speech Therapy (A0)	121	64	53%
Physician: Ophthalmology	44	37	84%
<b>Leadership and Management</b>			
Nurse: Education, Leadership, and Management	79	78	99%
Master of Hospital and Healthcare Administration	172	193	112%
<b>Undergraduate Medical Education</b>			
Undergraduate Medical Education	1018	976	96%

\*Prioritized cadres for which interventions have not yet been designed (four out of 37 prioritized cadres) include: Biomedical Engineers, Mental Health Nursing, Perfusion Therapy, and Occupational Therapy

Working backwards from these health workforce targets, targets for training volume, faculty numbers and retention of graduates of faculty have been set. These targets are identified in each respective implementation strategy section. See Section 13. for quantification of the wage bill implications associated with these targets.

## 6.4 ASSUMPTIONS & RISKS

### 6.4.1 Conditions for Success

The overall goal of this program is to improve the availability of qualified, equitably distributed health workers. There are several conditions that, though outside the immediate scope of the program, must be in place to ensure that the program's interventions are able to lead to the intended results. These include:

**Increased public sector retention** through revision of remuneration schemes and non-financial retention incentives: HSSP IV identifies a specific need to address retention strategies for health professionals. This strategy assumes that under the directive of HSSP IV, MOH will develop and implement initiatives to increase public sector retention and that these will mitigate the threats that attrition poses to the expected impact of the program.

**Service readiness:** For health workforce scale-up initiatives to be successful in achieving the ultimate goal of expanded access to quality services, these efforts must be synced with corresponding efforts to ensure that the clinical practice environment for these specialists is available, including all required equipment and organization of specialty clinical services. The Specialty and Sub-specialty Road Map are described in Section 8.4.

**Demand for training:** The National Strategy for Health Professions Development 2030 proposes to dramatically scale enrollment in many training programs. This assumes that there is latent demand for health professions training and upskilling. The strategy includes resources to sponsor study abroad tuition for all cadres in scope, which will increase the attractiveness of this career path and facilitate demand for enrollment positions. Tuition sponsorship for domestic programs should also be considered to increase demand for domestic programs as needed. It is estimated that it would cost US\$45M over 10 years to fully sponsor tuition of all trainees in the prioritized domestic training programs. The strategy does plan for continued salary support for current practitioners who enroll in further studies (e.g. an A0 nurse will continue to receive their nurse salary as they study for a master's degree).

**Effective deployment and distribution:** The Government of Rwanda aims to have a more qualified and equitably distributed health workforce. This strategy focuses on the training aspects of creating an expanded pipeline for high quality training that is expected to increase the volume of graduates and therefore overall number of qualified providers in the health workforce. The strategy does not include in scope interventions to address the distribution of health workers with appropriate level of training to health facilities. It is assumed that MOH through other policy channels addresses these issues as a complementary initiative toward achieving its overall goals.

## 6.4.2 Risks

**COVID-19 Pandemic:** The NSHPD design and planning process initiated in mid-2019 and planning was concluded in February 2020, shortly before the WHO declared COVID-19 a pandemic in March 2020. The full impact of COVID-19 on health sector budgets, health professional needs, and supply and demand for training continues to be monitored. The interventions outlined in the strategy will necessarily need to be adjusted as the strategy is operationalized to reflect the changing reality of the pandemic. At the same time, the pandemic has highlighted the ever pressing need to strengthen health systems by adequately training, hiring, and protecting health workers. The Government of Rwanda recognizes this need and continues to prioritize health workforce development as a means to strengthening its health system as it responds the current pandemic.

**Private sector attrition:** A key risk in this strategy is that medical specialists and other human resources for health will defer their responsibilities in the public sector to work in the private sector. Physicians and nurses in Rwanda have commented upon the draw of the private sector facilities: increased wages and lower workloads. To counter this, additional incentives such as the performance-based financing program help to retain critical human resources in the public sector health system of Rwanda. In the medium to long-term, Rwanda may explore enhanced mechanisms for regulating and contracting the private sector.

**Fiscal space contraction:** This strategy implies an additional wage bill obligation for the Government of Rwanda to absorb the expected number of graduates into the public sector health workforce. If assumptions about economic growth are not borne out or the public sector wage bill contracts for other reasons this would threaten the success of the program in achieving its ultimate goal. To mitigate for this the strategy provides for a Health Labor Market Analysis in the fourth year of the program to assess the forecasted wage bill and implications for health workforce production.

**Faculty attrition:** Current faculty calculations are a minimum and do not account for attrition of faculty over time – without domestic training options for the subspecialties this will necessitate the training/hiring of faculty trained abroad to replace lost faculty over time. Budget is not planned for replacement hiring. Rather it is assumed that training institutions will be able to train and retain the required faculty.

**Strategy fragmentation:** Strategies of this scope and scale are subject to partial funding or funding received in a fragmented way from various sources over time. This can mean that some aspects of a single strategy are funded while others are not, which ultimately can reduce or nullify the intended impact. For example, if funding to train and retain a Pediatric Cardiology faculty is secured and implemented, but funding to procure the corresponding equipment required to deliver services and train in Pediatric Cardiology is not secured or is delayed, then the Pediatric Cardiologist will not be able to train or provide services as intended. To mitigate for this risk, it is recommended that faculty, infrastructure/equipment, and other interventions for a given cadre or training program are considered as packages and that resources be secured to fund these packages in whole. This will reduce fragmentation across the strategy and increase the likelihood of impact. The Secretariat responsible for oversight of the program will develop tools to monitor for risks of mitigation across the operational plan.

## 7 METHODS

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### 7.1 PRIORITIZATION OF ACADEMIC PROGRAMS

Through a series of meetings with the Director General for Planning and Hon. Minister of State, the MOH developed a list of prioritized training programs that would be included in scope for the strategy. This list was iterated from January 2019 through January 2020 based on inputs from senior leaders as well as consultation with other stakeholders involved in health workforce training. The list includes cadres from the Rwanda HRH Program (2012-19) but was expanded to include new programs to ensure that the next phase of health workforce development in Rwanda takes into account shifting disease burden and service needs. The list was developed to include additional medical specialists

needed at higher volumes to extend specialty services to lower levels of care in the health system, as well as a select group of sub-specialists who are needed to provide advanced services in critical demand. Additionally, the list of programs in scope also includes lower levels of providers such as midwives that are part of effective primary and secondary care systems and are known by MOH to be characterized by major workforce shortages.

## 7.2 WORKFORCE TARGET SETTING

### 7.2.1 Rationale

Planning for health workforce training should be anchored against clear targets for the health workforce, so that supply of health workers is aligned with health system demand (where health system demand is a function of service demand—expressed and latent—as well as economic demand for health workers, i.e. fiscal space). In addition, health workforce needs are rapidly evolving because of demand generation investments and increased access to services. As a result, health workforce targets quickly become outdated. Furthermore, the current organizational structure developed in 2016 is considered inadequate (MOH). For example, the current structure does not clearly include all the specialists now available and practicing in Rwanda, nor do they specify the distribution between those specialties needed at each facility level. As part of the development of National Strategy for Health Professions Development, MOH undertook a process to set desired facility staffing norms for all programs within scope as a goal post against which training scale could be determined.

### 7.2.2 Data Source Mapping and Gap Analysis

An in-depth desk review was conducted to identify existing sources of national health workforce targets, data on the distribution of health workers and health workforce projections.

Public sector health workforce targets and distribution were extracted from the following documents:

- HSSP 4 Health Workforce indicator targets for 2024 (3)
- Rwanda National Surgical, Obstetrics and Anesthesia Plan (NSOAP) 2018-2024 (4)
- Rwanda National Strategic Plan for Eye Health 2018-2024 (5)
- Rwanda National Ear and Hearing Care Plan 2018-2024 (6)
- Official Gazette n° 47 of 21/11/2016 – Organizational Structure (7)
- Official Gazette n° 41 bis of 10/10/2016 – Organizational Structure for CHUs (8)
- Workload Indicators Staffing Needs (WISN) 2019

Additional information on health workforce distribution, projections and costing were identified in the following documents:

- Master Facility List Final Report (MFL) - November 2018 (1)
- Health Labor Market Analysis (HLMA) – May 2019 (2)

### 7.2.3 Process

Several rounds of consultations were held with senior leadership in the Ministry of Health, including the Honorable Minister of State, the Permanent Secretary, the Director General of Planning, and the Director General of Clinical Services, among others. These meetings were the primary means for determining the targets and were informed by the considerations listed above.

The purpose of these meetings was to review, revise and propose facility-based staffing norms that indicate the number of staff required at each level of facility. An Excel-based tool was developed to then calculate total health workforce requirements by 2030 across 551 facilities in Rwanda based on norms per facility level. The model provides

for facility growth, as MOH is planning to add an additional 36 health centers and four district hospitals by 2030. Thus, the targets grow between 2019 and 2030 based on the number of additional facilities.<sup>6</sup>

Stakeholders reviewed several categories of inputs when considering proposed norms, including the data sources described in Section 7.2.2 and the workload estimates described in Section 7.2.4.

The core leadership group for strategy development also convened a workshop with key stakeholders representing the Ministry of Health; teaching, provincial, and district hospital Director Generals; University of Rwanda(CMHS); private universities; among others. The major outcome of this workshop was target staffing norms based on the service delivery clusters. The two key parameters that were considered were:

- Service delivery appropriateness: The primary focus of the meeting was to refine targeted staffing norms at each facility level to ensure an appropriate mix of skills by service delivery cluster; e.g. for women’s and children’s health, that there are enough pediatric nurses to support physician pediatricians, and enough obstetrics and gynecology physicians to work with the midwives.
- Production feasibility: Participants at the workshop were encouraged to consider the production capacity of the University of Rwanda when determining targets so as not to set targets far beyond what the university might be able to realistically produce over the next 10 years.

The targets defined at the workshop were subsequently reviewed again by the MOH senior leadership to address issues of rational deployment across related cadres—for example, rationalizing deployment of Pediatric Nurses against deployment of Pediatric Specialists. Additionally, the MOH subsequently considered the wage bill affordability of all the proposed targets.

#### 7.2.4 Input: Workload Indicators of Staffing Need

A Workload Indicator Staffing Need (WISN) analysis was conducted in 2019 for 36 districts hospitals, 4 provincial hospitals and 3 referral hospitals. The following list of cadres was included in this exercise:

*Table 7.2.4.A: List of WISN 2019 Cadres*

<b>PHYSICIANS</b>	<b>NON-PHYSICIANS</b>
General Surgeons	Anesthetists (non-physicians)
General Practitioners	Dental Therapists
Internists	Laboratory Technicians
Obstetricians/Gynecologists	Midwives
Pediatricians	

The WISN produces calculated staff requirements by individual facility.<sup>7</sup> For the types of providers for which WISN was completed, the recommended staffing levels from this exercise were reviewed, compared against the current staffing norm (if defined) and taken into consideration for the development of a new norm. In most cases, the WISN was not used as the final norm, but informed stakeholder discussions and served as a reference point for MOH decisions.

<sup>6</sup> The facility growth plan should be reevaluated at the mid-term review to assess actual growth in facilities (2020-2025) and anticipated growth in facilities (2025-2030).

<sup>7</sup> The WISN was not completed on every facility for every cadre. As an example, while the analysis of Midwives requirements was conducted on all 36 DH, 4PH and 3RH, the analysis of Pediatricians was conducted on 12DH, 4PH and 3RH and the analysis of Ob/Gyn was conducted on 9DH, 3PH and 3RH. Therefore, averages for cadres such as Pediatricians were extrapolated to similar level facilities and reviewed for consideration.

## 7.3 PIPELINE MODEL

To plan for appropriate levels of training (i.e. enrollment) scale, a pipeline model was developed to indicate the level of enrollment in health training programs needed to meet national public sector workforce targets. The pipeline model is an excel-based tool that was developed for each training program within the scope of the program.

### 7.3.1 Assumptions

The pipeline model accounts for the following inputs and assumptions per cadre:

Table 7.3.1.A: Pipeline Model Assumptions and Sources

Assumption	Source
Training program average actual first-year enrollment	Training program records
Number of currently enrolled students/trainees in each year of the program, including internship and post-graduate service requirements	Training program records
Graduation rate	Training program records
Training program maximum first-year enrollment (assuming inputs required)	Stakeholder consultation
Percent of graduates entering the public workforce	Stakeholder consultation
Yearly average workforce attrition	Stakeholder consultation
Current public sector workforce	MOH

### 7.3.2 Pipeline flow

The pipeline uses the inputs described in the section above to determine the number of additional health workers that will be added to the public sector workforce based on first-year enrollment in the training programs after accounting for graduation and attrition rates over ten years. This is then compared to a target line based on the aggregate public sector workforce target per cadre, as described in the target setting exercise above.

## 7.4 FACULTY INTERVENTION DESIGN FOR ACADEMIC PROGRAMS

Design of faculty interventions academic programs begins with reviewing the gap between the workforce target and the expected workforce in the pipeline model. First-year enrollment in the academic program can then be manipulated over the ten-year period to determine the extent to which training needs to be scaled to reach the public sector health workforce targets.

### 7.4.1 Defining first-year enrollment in academic training programs

Using the pipeline model, the gap between the current workforce training capacity and the newly defined target was assessed. In order to close the gap, CMHS program leads were consulted on the extent to which they could scale up first year enrollment in their training program to begin to close the gap. It should be noted that for many programs, the duration of the training program means that interventions to scale up intake of students/trainees would not have an impact on the workforce for several years, in some cases up to six years later due to the length of training.

### 7.4.2 Faculty requirements

The Higher Education Council (HEC) of Rwanda sets accreditation standards which determine the student-to-faculty ratios for the training programs; however, in most cases, these ratios are not broken down by the specific skill sets needed within a faculty of a program. For example, the standards may require a program to maintain 10 faculty to remain accredited, but the standards do not define what type of skills each of those 10 faculty members must have, such as pediatric cardiology or pediatric infectious disease. In the absence of publicly available standards, program leads were consulted on the necessary breakdown of faculty skills and qualifications needed to adequately staff the program to provide high-quality training to the targeted enrollment based on the national targets. Program leads then

defined how many of each faculty type was needed, and how many were currently available at UR. In all cases the aggregate HEC norm is maintained or exceeded.

#### 7.4.3 Faculty recapture and hiring graduates

Through the course of developing this strategy, it became apparent that many of the unfilled faculty positions required by UR to sustain the training programs could be filled by existing practitioners in Rwanda. However, the tension between immediate service provision and long-term sustainability of the academic training programs had not been resolved and thus many of the necessary faculty members were not actively engaged in educational activities. The inter-ministerial task force overseeing the development of the strategy determined that in order to efficiently utilize existing resources and thereby reduce the cost of the interventions, the MOH and UR should prioritize immediately hiring all available Rwandan practitioners with the skills to fill critical faculty gaps. Program leads were then consulted on how many additional practitioners are in Rwanda with the skills to serve in the different faculty roles, and how many might realistically be hired by UR in the immediate future. See Section 0 for a further description of this exercise and its results.

During the course of the faculty recapture some high performing graduates will be retained to fill some faculty positions as generalist faculty while more experienced faculty are sent abroad to further specialize or receive advanced qualifications. In other cases, the recent graduate will be sent to study abroad while current faculty continue delivering the programs. These decisions will be determined at the department level as appropriate.

#### 7.4.4 Study abroad interventions

The aim of the strategy is to ensure that targeted training programs at CMHS have a complete set of full-time faculty members in order to deliver high quality training without relying on external or visiting faculty. Therefore, for all required faculty positions where there are not available practitioners in Rwanda to fill the gap and local training is not available, it was determined that they would need to be trained abroad before returning to serve as faculty in their respective programs. In general, the plan calls for sending recent graduates of the respective training program to sub-/specialize in the necessary fields and only to send a limited number for study abroad at any given time in order to limit the drain on available expertise within Rwanda while acknowledging any delay in sending trainees abroad consequently delays their return and hampers the ability of the program to be sustained by permanent faculty. As a general principle, it was determined that no more than four faculty members per academic program should be sent to study abroad each year so as to minimize disruption of routine training. The individuals and specific programs that they will attend will need to be determined in the operational phase of the program to align with the availability of qualified applicants and spots in the programs.

#### 7.4.5 Visiting faculty to fill gaps where needed

In order to fill immediate gaps in the availability of faculty, visiting faculty are needed until permanent faculty are developed in study-abroad training programs. While full time equivalents (FTEs) are desired for most permanent Rwandan faculty, the minimum necessary duration that visiting faculty are needed was determined by the training program lead, ranging from two- to 12-months per year, to ensure the required curricula content is delivered without inflating costs. In some cases, this meant that fewer visiting faculty are needed than full-time permanent faculty. For example, if two permanent faculty are required for a program, but the program lead determined that at bare minimum two visiting faculty spending two months each could deliver the necessary content, then when one permanent faculty returns in a subsequent year they might still be supported by an additional two months of a visiting faculty until two permanent faculty are hired. An intervention design tool linked to the pipeline model automatically calculates visiting faculty requirements once study abroad and national faculty hiring plans are set.

##### 7.4.5.1 Academic Partnerships

In order to ensure recruitment of quality visiting faculty who can not only fill gaps, but also continue to develop the relationships with international academic institutions, additional funds have been budgeted to fund ongoing and new academic partnerships. These academic partners will be contracted based on their ability first and foremost to provide

high-quality visiting faculty capable of fulfilling the needs described above. Academic partners will provide technical support to the visiting faculty and the department at large by offering additional technical resources, access to international medical journals, literature, research collaboration opportunities, joint conference presentation, connections to the foremost experts in relevant fields, thought partnership and technical assistance on training program development and strengthening, international training rotations and training opportunities, funding and fellowship opportunities, among other benefits. Many of these benefits have been realized during the HRH Program (2012-2019) and the benefits of academic partners has been published about extensively.

## 7.5 STRATEGY DESIGN WORKSHOP – JANUARY 2020

A 3 days' design workshop was organized to seek stakeholders' inputs on a range of policy issues critical to the strategy. The workshop was led by the inter-ministerial committee chaired by the Ministry of Health gathering 107 participants from different institutions. Participants were organized into Task Teams consisting of a secretariat, relevant technical members, and a steering committee representative to ensure that identified interventions were designed, costed, and articulated in a comprehensive strategy document.

Task teams:

- 1. Governance and teaching hospital reform:** Participants in this work stream were tasked to rethink governance structure of teaching hospitals to ensure quality service and academic integration by strengthening national teaching hospital accreditation standards and health professional councils, to revise financing model in line with revised governance structure and develop recommendations for income generation for teaching hospitals, to establish protocols for key management functions, and propose overall framework for postgraduate training in medicine and health sciences to meet the increasing demand for professionals.
- 2. Teaching hospital expansion:** The team members were tasked to develop a list of potential teaching sites with respect to needs of training programs for additional teaching sites beyond full teaching hospitals. As the three-day retreat was insufficient for additional tasks, the team was also asked to propose a process to assess current training sites and cost gaps.
- 3. Faculty recapture:** The team's task was to identify available potential (sub) specialists in Rwanda across all disciplines who would be qualified and inclined toward faculty positions. The task team considered providers currently working in clinical positions but not teaching, retired providers, and those studying abroad but expected to return. The Task Team conducted its exercise under the assumption that job levels and remuneration would be harmonized in such a way as to attract clinical providers to academic positions. The Task Team also advised on the steps required to operationalize immediate faculty hiring.
- 4. Remuneration and job levels harmonization:** The remuneration schemes between MOH clinicians and UR faculty are not aligned in a way that incentivizes clinicians to undertake academic positions. Participants in this task team focused on reviewing the current remuneration scheme and job classifications to assess existing imbalances in remuneration and they proposed a scheme that incentivizes teaching and academic career pathways.
- 5. Professionalism, attitude and quality:** Members of this Task Team focused on elaborating strategies to improve quality of care from a health workforce perspective by analyzing current challenges and gaps and developing interventions to improve professionalism, attitude, and quality of service provided by health care workers.

At the end of the workshop, each chair of the Task Team presented to the Steering Committee and all other participants their suggested interventions, implementation plan, and support needed from the Steering Committee for the way forward. Following the workshop, the Steering Committee met to revise and provide final feedback or resolution on the recommendations made and issues flagged by the Task Teams. Their feedback is incorporated in the strategy and costing.

## 7.6 FACULTY AND WORKFORCE COSTS

Annual costs for the ten-year period of 2020-2030 are estimated to show the increase in workforce wage bill for the health workers associated with each training program. As the interventions to scale pre-service training go into effect, more specialist health workers are absorbed into the workforce each year with the goal of reaching health workforce targets or a share of the targets by 2030.

Faculty salaries in Table 7.6.1.A were used as estimated salaries for clinicians working in the teaching hospitals. These salaries include revised annual gross budgeted salaries from December 2019 without performance top ups for each role. For all other clinicians, annual gross budgeted salaries from the most recent Gazette (21/11/2016) outlining the salary structure for public hospitals were used in the estimate the workforce salaries. Performance based financing or other performance top ups for each clinical role was not added. Please see Table 7.6.1.B below of annual clinical workforce wages used for 2020.

*Table 7.6.1.A CMHS Faculty Salaries (revised annual gross budgeted salaries from December 2019; not including performance top ups)*

CMHS Faculty Salaries	Annual Cost (USD)
Full Professor	\$ 22,897
Associate Professor	\$ 18,880*
Senior Lecturer	\$ 18,880
Lecturer	\$ 17,162
Assistant Lecturer	\$ 12,437
Tutorial Assistant	\$ 7,509

*\*Note: Base cost for Senior Lecturer and Associate Professor were equivalent but differed when performance top-ups were included*

*Table 7.6.1.B MOH Workforce Salaries (annual gross budgeted salaries in Gazette (21/11/2016) (does not include performance based financing or other performance top ups)*

MOH Workforce Salaries	Annual Cost (USD)
Senior Consultant	\$ 23,147
Consultant	\$ 16,700
Junior Consultant	\$ 12,102
Chief Medical Officer	\$ 10,168
Senior Medical Officer	\$ 9,246
Medical Officer	\$ 8,407
Junior Medical Officer	\$ 7,306
Nurses A0	\$ 4,226
Nurse/Midwife Specialists	\$ 4,226
Midwife A1/A0	\$ 4,226
Medical Imagery Technician	\$ 4,226
Laboratory Technician	\$ 4,226

Biomedical Technician	\$	3,622
Dental Therapist	\$	4,226
Dental Surgeon	\$	8,407
NPA	\$	4,226
Master of Health and Hospital Administration (MHA)	\$	4,226

Physician specialists in the workforce may be at a junior consultant, consultant, senior consultant or chief consultant level. Specialists start their career at a junior consultant level and may rise in position as various experience and publication requirements are fulfilled. Given that throughout the ten-year intervention period, physicians will be at different salary levels, the assumption was made to cost all physician specialists in the workforce at the consultant level to show the average salary for each physician.

Similarly, faculty in the clinical workforce may be at Full Professor, Associate Professor, Senior Lecturer, Lecturer, Assistant Lecturer, or Tutorial Assistant due to their equivalent clinical position and may move up as additional experience and publication requirements are fulfilled. As there may be different salary levels across each of the 10 years, clinical faculty for the teaching hospitals were costed in the following manner: subspecialists were costed at the senior lecturer position, specialists were costed at the lecturer position, PHD nurses and allied health professionals were costed at the lecturer position, masters level nurses and allied health professionals were costed at the assistant lecturer position and bachelors level clinicians were costed as tutorial assistants. For further information on the position equivalents, please see section 8.1 Remuneration Harmonization at University of Rwanda.

## 7.7 INTERVENTION COSTING

Interventions to scale up pre-service training include sending specialists abroad to sub-specialize, hiring temporary visiting faculty to fill gaps, and expanding teaching sites and facilities with additional equipment and infrastructure.

### 7.7.1 Study abroad interventions

Study abroad training costs are estimated based on the cost of study abroad for comparable programs at the University of Cape Town (UCT).<sup>8</sup> Total study abroad costs include tuition costs, housing, food, transportation, flights, visa, and equipment (books, stationary and one-time cost of laptop). Tuition is estimated through reference costs taken from a few specialties and degrees. For example, surgical subspecialty training tuition is generalized and referenced from the UCT tuition for a MPhil in Emergency Medicine. To account for individual subspecialty training costs differences and the ability for training to occur in other countries and institutions, a 30% buffer was added to all study abroad costs from UCT. The costs by general training program are listed below in Table 7.7.1.A:

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<sup>8</sup> UCT was selected as a representative study abroad destination as UCT is one of the leading training institutions in the region which has a proven track record of educating practitioners who then return to their home country to start/run training programs. See UCT's [Child Nurse Practice Development Initiative](#) and [Africa Paediatric Fellowship Training Program](#).

Table 7.7.1.A Cost per Study Abroad Program (USD)

Study Abroad	Total Cost per Year of Study	One-Time Cost for Full Study Abroad Period
Physician - Medical Specialist	\$ 40,484	\$ 9,135
Physician - Surgical Specialist	\$ 40,484	\$ 9,135
PHD	\$ 34,315	\$ 2,980
MSc Nursing	\$ 38,514	\$ 3,525
MPH	\$ 35,099	\$ 2,980
MSc Basic Sciences	\$ 35,039	\$ 2,980

### 7.7.2 Visiting faculty interventions

While Rwandan faculty are studying abroad to gain necessary qualifications visiting faculty will be required to fill gaps and ensure that training can continue while delivering all necessary modular components to trainees. Where possible, volunteers including from the diaspora will be engaged for visiting faculty positions before paid visiting faculty are considered.

The HRH Secretariat Faculty Recruitment & Academic Partnerships Department will develop an operational plan for faculty recruitment that prioritizes volunteers and diaspora hires. Potential strategies include working through existing diaspora networks, and contacts of faculty already working at UR CMHS; posting adverts for volunteer positions on global health networks in targeted geographies; working with national, regional, and international associations to advertise these positions and connect with volunteer programs.

## 8 POLICY & PLANNING INTERVENTIONS

### 8.1 REMUNERATION HARMONIZATION AT UNIVERSITY OF RWANDA

In order to establish a sustainable education system and decrease its reliance on visiting faculty members, CMHS needs to hire the necessary full-time Rwandan faculty members to staff its training programs. Many of the specialist and sub-specialist providers required to serve as faculty in the training programs are in fact already practicing in Rwanda and often provide clinical services in the same facilities where training takes place but are not effectively supporting the training programs.

Analysis indicates that over half of the faculty gaps currently faced by programs at CMHS could be filled by existing clinicians in the country; interventions to facilitate hiring of these existing specialists and sub-specialists (across disciplines) will reduce the need to send potential faculty abroad for training or bring in visiting faculty to fill gaps, thereby reducing costs.

However, at current rates it is difficult to attract clinicians to academic positions due to imbalances in job levels and corresponding remuneration rates, as illustrated in the tables below (see Table 8.1.1.A and Table 8.1.1.B).

Table 8.1.1.A Current Levels of Faculty Medical Doctors

Clinical Position	Level	Index	Academic position	Level	Index
Chief Consultant Doctor	F				
Senior Consultant Doctor	F	441	Full Professor	F	441
Consultant Doctor	1.IV	350	Associate Professor	1.IV	400
Junior Consultant Doctor	2.III	350	Senior Lecturer	2.III	400
			Lecturer	3.II	400
Chief Medical officer	4.V	350			
Senior medical officer	4.IV	350			
Medical Officer	4.III	350	Assistant Lecturer	4.III	400
Junior Medical Officer	4.II	350	Tutorial Assistant	4.II	400

\*Blue boxes indicate levels that are different but should be similar based on education requirements (PhDs) and scope of work. Similarly, yellow boxes indicate levels that are different but should be similar based on education requirements (Master's) and scope of work

Table 8.1.1.B Current Faculty of Nurses, Midwives, and Allied Health Professionals

Clinical Position	Level	Academic Position	Level
		Full Professor	F
Senior Consultant	1.IV	Associate Professor	1.IV
Consultant Nurse	2.III	Senior Lecturer	2.III
Junior Consultant Nurse	3.III	Lecturer	3.III
		Assistant Lecturer	4.III
Junior Registered Nurse with A0	4.III	Tutorial Assistant	4.II
Junior Registered Nurse with A1	7.II	Clinical Instructor	7.II

Acknowledging these challenges and the absolute necessity of attracting more faculty to achieve sustainability and scale, the strategy will pursue actions to harmonize job levels across clinical and academic positions as proposed below (see Table 8.1.1.C and Table 8.1.1.D).

Table 8.1.1.C. Harmonized Clinician and Academician Levels

Current MOH Titles	UR Titles	Harmonized Levels
	Full Professor	E
Chief Consultant Doctor	Associate Professor	F
Senior Consultant Doctor	Senior Lecturer	F
Consultant Doctor	Lecturer	1.IV
Junior Consultant Doctor	Assistant Lecturer	2.III
Chief medical officer	Tutorial Assistant	4.V
Senior medical officer	Tutorial Assistant	4.IV
Junior Medical Officer/GP	Tutorial Assistant	4.III

Table 8.1.1.D. Harmonized Nursing, Midwifery, and Allied Sciences Levels

Current MOH Titles	UR Titles	Harmonized Levels
	Full Professor	E
	Associate Professor	1.VI
	Senior Lecturer	1.VI
Senior Consultant Nurse/Midwife/Allied (PHD)	Lecturer	1.V
Consultant Nurse		2.IIV
Junior Consultant Nurse/Midwife/Allied	Assistant Lecturer	3.III
Nurse A0/Junior Registered Nurse/Midwife/Allied with bachelor degree	Tutorial Assistant	4.III
Nurse A1/Midwife/Allied/Junior Registered	Clinical Instructor	7.III

Harmonization levels as proposed are estimated to make a marginal difference in current CMHS payroll, as indicated below (see Table 8.1.1.E).

Table 8.1.1.E. Summary of Cost Implications for Current Employment at CMHS

	Original Levels		Harmonized Levels		Difference with Harmonization	
	RWF	USD	RWF	USD	RWF	USD
Current CMHS payroll	2,528,576,004	2,718,899	3,240,394,749	3,484,295	711,818,745	765,397

The Ministry of Public Service, Ministry of Finance and Economic Planning, Ministry of Education, and Ministry of Health will develop an inter-ministerial task team to implement harmonization and therefore enable immediate faculty hiring (see subsequent section).

## 8.2 IMMEDIATE FACULTY HIRING

In recognition of the need to aggressively increase the number of Rwandan faculty at CMHS and reduce reliance on visiting faculty, as part of the January Strategy Design Workshop (2020) a task team was convened comprised of representatives from University of Rwanda, MOH, and professional associations conducted to explore the feasibility of “recapturing” around 200 hiring qualified providers who are currently working in Rwanda but not teaching.

The task team conducted an exercise to estimate the number of faculty that could be recaptured for faculty positions for each of the academic programs in scope, finding that 34% of the current faculty gaps across the 37 targeted programs could be addressed through recapture (see table 8.2.A).

Table 8.2.A Potential Faculty Recapture by School

School	Potential Faculty	Recapture cost at harmonized levels (USD)
Medicine and Pharmacy	130	2,318,358
Dentistry	25	263,998
Nursing & Midwifery	30	398,406
Health Sciences	17	353,806
<b>Total</b>	<b>202</b>	<b>3,334,567</b>

An inter-Ministerial Steering Committee reviewed these findings and approved measures to hire just over 200 providers as faculty. It is assumed that this volume of providers can only be hired once harmonization of job levels and remuneration is complete (see previous section), as providers will need enough incentive to transition to academic positions. In addition, the hiring process will include measures to screen faculty for suitability to and inclination toward teaching.

The budget implications of recapturing and immediately hiring needed faculty are outlined below (see Table 8.2.1.B).

Table 8.2.1.B Summary of Salary Remuneration with Intervention

	Original Levels		Harmonized Levels		Difference with Harmonization	
	RWF	USD	RWF	USD	RWF	USD
Current CMHS payroll	2,528,576,004	2,718,899	3,240,394,749	3,484,295	711,818,745	765,397
Additional faculty with recapture	2,040,619,429	2,194,214	3,101,147,620	3,334,567	1,060,528,191	1,140,353
<b>Total</b>	<b>4,569,195,433</b>	<b>4,913,113</b>	<b>6,341,542,369</b>	<b>6,818,862</b>	<b>1,772,346,936</b>	<b>1,905,750</b>

The task team also advised on the steps necessary to operationalize this strategy. As necessary first steps:

- All health providers working at University Teaching hospital are mandated to train, health care delivery and research.
- Role harmonization must be implemented (see above) in order to attract currently practicing clinical providers to faculty positions.
- Budget to be allocated to enable immediate hiring of additional faculty at harmonized rates

The HRH Secretariat Steering Committee will ensure implementation of these decisions. Once these pre-conditions have been met, recruitment will begin for the needed faculty positions. This is targeted for the strategy kick-off period to ensure that maximum possible faculty are hired in time for the 2020-21 academic year.

### **8.3 HEALTH WORKFORCE PLANNING AND DEVELOPMENT STRUCTURE AT MOH**

The National Strategy for Health Professions Development (2030) is built on analysis to determine the required staffing levels and the corresponding training targets for prioritized training programs. In line with the HSSP IV objective of strengthening resource planning, management and governance and as a part of its vision to develop an adequate workforce with the necessary skill mix,

The HRH Secretariat and relevant stakeholders will be responsible for periodic planning exercises, including setting health workforce norms and targets, reviewing progress against those targets, and advising on corresponding priorities for recruitment and deployment. The HRH Secretariat will be responsible for analytical tools for planning. Specifically, it is proposed that every 3-4 years the Secretariat will refresh pipeline models for prioritized training programs to set enrolment targets and scale up or scale down training as necessary.

### **8.4 SPECIALTY AND SUB-SPECIALTY ROAD MAP**

The National Strategy for Health Professions Development (2030) reflects implicit plans for the extension of services in Rwanda's health system. For example, the plan provides for the development of the qualified providers needed to extend surgical services at the provincial hospital level and to be able to staff emergency departments at all referral hospitals in the next three years. A process is proposed to more explicitly plan for the expansion of secondary and tertiary services in Rwanda.

In the second year of the strategy the HRH Secretariat will commence a process to develop a detailed Specialty and Sub-specialty Road Map for the country. The Road Map will describe the vision for conferral of services at all levels, and will indicate corresponding human resource, equipment, infrastructure and other requirements.

Once the service provision plan for each level has been defined, MOH will conduct a demand-based staffing analysis exercise to develop the human resource requirement components for the Road Map. The resulting staffing recommendations will be incorporated alongside infrastructure and equipment requirements and will be costed along a timeline. The mid-term review for the strategy will take into account any revised workforce targets that result for this exercise and will adjust intervention design as required.

## **9 TRANSFORMING THE SERVICE DELIVERY AND EDUCATION ENVIRONMENT: INTEGRATION AND INNOVATION**

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### **9.1 TEACHING HOSPITAL GOVERNANCE**

As Rwanda's growing population requires more advanced care, transformation is necessary at the health facility level to create hubs for innovation for service delivery, education, research and management. The Rwanda Teaching Hospital Reform Initiative organizes solutions in governance structure, finance, management and regulation.

#### **9.1.1 Background**

Over the last seven years of health workforce development challenges at teaching hospitals and sites were highlighted as hospitals both rely on the Ministry of Health for service delivery functions and the University of Rwanda's College of Medicine and Health Sciences for education and research functions. Academic program leadership at the University

of Rwanda's College of Medicine and Health Sciences have expressed challenges coordinating educational activities for trainees at the university teaching hospitals, including accountability for teaching, participation in academic programming, among other challenges.

Efforts have been made in 2013-14 and 2017-18 to assess the relationship between the UR and CHUs, including stakeholder workshops to redesign the governance structures in 2014 (which were not implemented) and development of MOUs in 2017-18 (which have been signed but are lacking enforcement mechanisms).

At teaching hospital level, health professions education in the public sector involves the University of Rwanda's College of Medicine and Health Sciences and the major teaching hospitals, namely CHU-Kigali and CHU-Butare. Presently, the CHUs are independent entities which report to the MOH, while UR reports to the Ministry of Education. Additional consideration is needed for non-CHUs such as Rwanda Military Hospital, Ndera Neuro-Psychiatric Hospital and King Faisal Hospital which are deemed as teaching hospitals. As outlined in this strategy further considerations are needed for expanded teaching sites including referral, provincial, district and at times health centers (which are used for nursing and midwifery training).

### 9.1.2 Problem Analysis

Consultations with representatives from teaching hospitals, the College of Medicine and Health Sciences leadership and faculty, Ministry of Health and professional bodies, regulatory agencies and patient representatives from civil society highlighted the following major challenges at university teaching hospitals (CHUs) during the Strategy Design Workshop:

- Teaching hospitals are not fully implementing their mandate of integrating service delivery, education and research
- Teaching hospitals and sites lack a binding agreement and collaborative framework between training institutions and hospitals for education and research
- Responsibilities for education, research and service delivery units within hospitals are fragmented within teaching hospitals and sites (e.g. the Department of Pediatrics does not have inter-professional staff (pediatric nurses, allied health professionals, etc.) and managers reporting to a single head of department)
- Teaching hospitals do not have sufficient funds for educational activities (e.g. equipment, projectors, teaching rooms, simulation laboratories, etc.). It is currently unclear if the MOH or University of Rwanda are responsible for education costs
- Staff qualifications are at times not in line with needed level of responsibility (i.e. years of experience in service delivery, education and research should be holistically evaluated for appointment to positions)
- Inflexible structures do not allow for career progression in teaching hospitals as there are limits to the number of senior consultant positions available causing experienced staff to be deployed to other facilities
- There is an imbalance of remuneration between clinical faculty paid by University of Rwanda and those paid by the Ministry of Health for similar responsibilities
- Uncoordinated responsibilities between training institutions and hospitals

Additional consultations are needed to further define challenges and propose solutions at non-CHUs and other health system level designated teaching sites.

### 9.1.3 Strategies and Interventions

To address challenges posed at teaching sites a comprehensive **Rwanda Teaching Hospital Reform Initiative** is proposed comprised of four major categories:

1. **Structure:** Rethink governance structure of teaching hospitals to ensure quality service and academic integration. An overall framework will need to be proposed for postgraduate training in medicine and health sciences to meet the increasing demand for professionals.
2. **Finance:** Revise financing model in line with revised governance structure and develop recommendations for parity in remuneration of clinical faculty and routine investments in clinical education, research and service-delivery at teaching sites.
3. **Management:** There is a need to develop protocols for key management functions, including personnel performance management with view toward maximizing leverages for teaching and quality care. Additional management improvements may be made to improve efficiency and effectiveness of care. Management protocols and systems should be developed once governance and finance structures are defined.
4. **Regulation:** The HRH Secretariat, HEC and health professional councils should develop and strengthen national teaching hospital accreditation standards (minimum standards for infrastructure, equipment and staffing at all teaching sites), standards for new health professions' training programs as well as certification of graduates where applicable (example: medical specialists, nursing specialists).

The following major recommendations from the Strategy Design Workshop (January 2020) serve as the basis for strategies and interventions.

The following recommendations were adopted:

- All clinicians at teaching hospitals will serve as clinical faculty. Those who do not qualify or do not wish to teach will be redeployed to other sites.
- Develop integrated functional departments/units within teaching hospitals which consolidate head of departments (single head of department for education and service)
- Develop process and policies for clinical faculty recruitment to ensure University of Rwanda and teaching hospitals jointly recommend staff with the appropriate experience and qualifications to positions
- Revise CHUs structure to be modified to ideal teaching hospital structure

The following activities are proposed in line with recommendations:

- Consolidate head of departments (single head of department for education and service)
- Develop process and policies for clinical faculty recruitment to ensure University of Rwanda and teaching hospitals jointly recommend staff with the appropriate experience and qualifications to positions
- Develop integrated functional departments/units within teaching hospitals and revised teaching hospital structures

#### 9.1.4 Structure

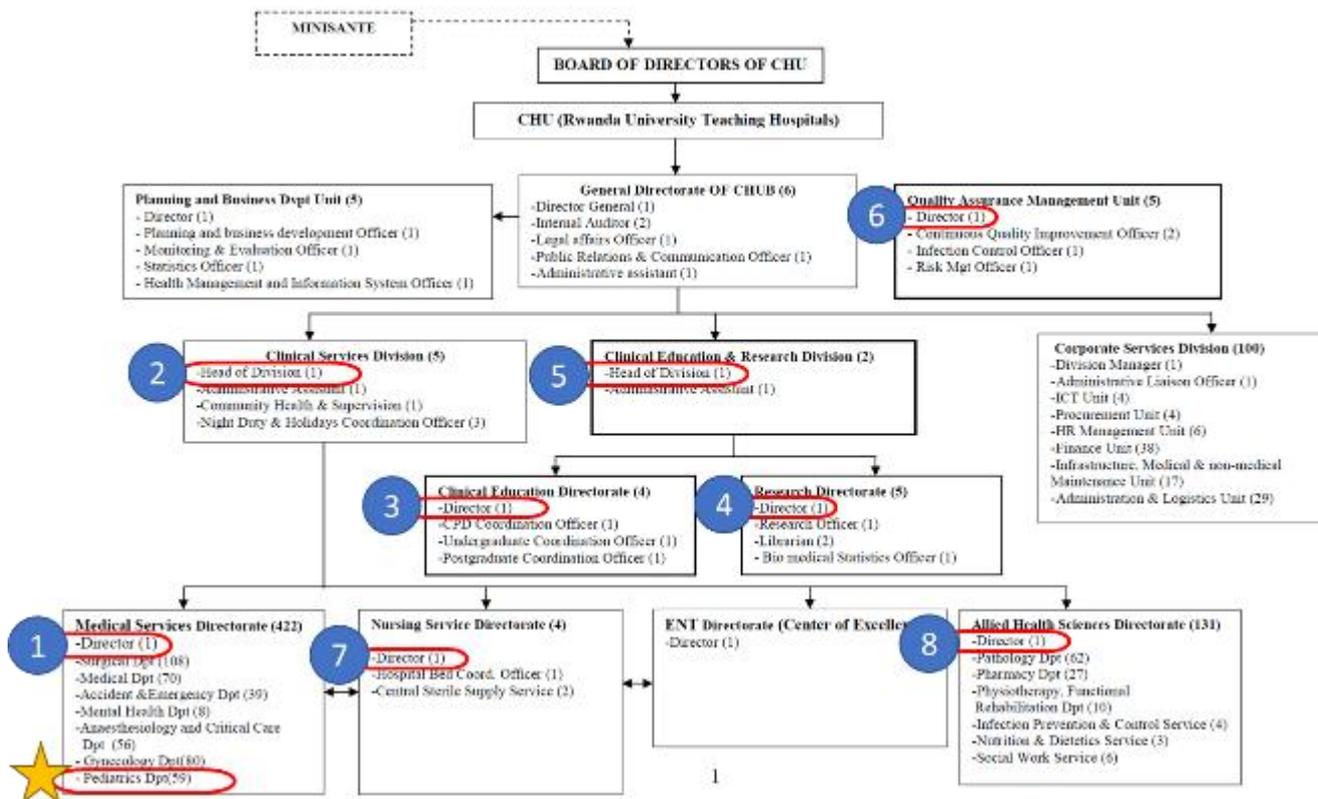
Current teaching hospital governance and reporting is fragmented and hospitals (e.g. Department of Surgery) are not functionally positioned to serve as a central place for integration and innovation for high-quality education, service-delivery and research.

The below figure shows current reporting and collaboration of units at CHUs. As an example, the Department of Pediatrics is highlighted (see yellow star in figure). In the current structure the head of the Pediatrics Department reports to and collaborates with (1) a Medical Director; (2) Head of Division for Clinical services; (3) Director of Clinical Education; (4) Director for Research; (5) Head of Division for Education and Research; (6) Director for Quality Assurance and Management; (7) Directorate of Nursing; and (8) Directorate of Allied Health Sciences.

The structural relations need to be recognized to promote inter-professional coordination and integration as nurses and allied health sciences professionals in the academic department. The reporting also needs to be streamlined and integrated in such a way that the same area or specialty within and across schools are aligned.

Additionally, at the leadership level, officials from the College of Medicine and Health Sciences are not represented at the Board of Directors level despite the mandate of CHU to serve as a premier clinical education center (see Figure 9.1.4.i).

Figure 9.1.4.i: Teaching Hospital and Governance Structure



To address these challenges in fragmentation a revised structure has been developed in consultation with stakeholders that strengthens departments to serve as hubs for integration for high quality service delivery, education and research. Inter-professional collaboration and coordination is achieved through streamlined reporting through heads of department while maintaining nursing and allied health sciences directors as resources in an Integrated Clinical Services, Education and Research Division. Quality assurance, education and research functions will be developed in each department as practices for quality, education and research vary greatly between types of services (i.e. Neurosurgery and pediatrics have different quality service delivery, education and research requirements). The revised structure also includes an operations manager with a Masters in hospital administration qualification that supports the head of department to organize department services, schedules, patient coordination and more. This important function will promote more efficient administration of core functions of each department.

### 9.1.5 Regulation

To adequately regulate and evaluate teaching hospitals, there is a need to:

- ensure mastery of skills and knowledge for the purpose of highest standards of professional achievements,
- ensure certification and re-certification of health professionals,

- revise standards for health professional training; assessment and regular review of training programs and Training sites; setting the Fellowship exit examination, and
- develop regulator functions to ensure the quality of professionals entering the workforce regardless of which institution they graduate from (UR, UGHE, AUCA, abroad).

Teaching hospital guidelines/standards are typically comprised of the standards for different training programs, the sum of which constitute a teaching hospital. The Task Team working on clinical site expansion will be assessing potential facilities into which training can be introduced, which will likely involve some form of standards or assessment mechanism which should be aligned, if not the same, as the standards for the teaching hospital.

1. Consider non-public training programs and non-CHU facilities: over the next 10 years, with the emergence of private universities, it is likely that other training programs will seek to utilize Rwanda’s major teaching hospitals which should be taken into consideration. Additionally, as referral and provincial hospitals are strengthened there may be additional facilities which will be considered for promotion as teaching hospitals which should also be considered.
2. Teaching hospital governance and financing of teaching staff may impact which entity is responsible for hiring and managing faculty for the Universities training programs. During faculty recapture, the HRH Secretariat will focus on identifying and ensuring all available faculty eligible for training who are currently in Rwanda are hired into the training programs.
3. The HRH Secretariat will focus on remuneration harmonization by reviewing the unit costs for clinician and faculty salaries which should be aligned with the financing component of the teaching hospital reform process.
4. Conduct further research on and operationalize revised teaching hospital and site governance model

## 9.2 TEACHING SITE EXPANSION

As Rwanda seeks to scale pre-service training for prioritized cadres in Rwanda in order to ensure that health worker production meets the demand of the public health sector, additional clinical training sites will be needed to accommodate the additional training needs. In comparison with Teaching Hospitals, clinical training sites are facilities which are equipped with the staff, equipment, and infrastructure, administrative and educational systems for discrete set of training programs.

Coordination of teaching hospitals:

Teaching hospital guidelines/standards are typically comprised of the standards for different training programs, the sum of which constitute a teaching hospital. The HRH Secretariat will be working on teaching hospital reform and will be reviewing, strengthening, and developing teaching hospital standards and assessment mechanism which should be aligned, if not the same, as the standards for clinical teaching sites.

1. Consider non-public training programs and non-CHU facilities: over the next 10 years, with the emergence of private universities, it is likely that other training programs will seek to utilize Rwanda’s teaching sites which should be taken into consideration. Additionally, as clinical delivery sites at all levels of the healthcare system are strengthened there may be additional facilities which will be considered for development as teaching sites which should also be considered.
2. Standards for teaching sites will include educator affiliation and remuneration. The teaching hospital reform task team will consider teaching hospital governance and financing of teaching staff which may impact which entity is responsible for hiring and managing faculty for the Universities training programs. The faculty recapture task team is focused on identifying and ensuring all available qualified faculty for the training programs who are currently in Rwanda are hired into the training programs, some of whom may already be

based in potential teaching sites. The task teams should coordinate to ensure educators in teaching sites are hired or affiliated in a way that will be aligned with the anticipated teaching hospital reforms as applicable.

- The Deans will play an important role in this project. They can help to identify current challenges that need to be addressed through the development of standards.

## 10 IMPLEMENTATION STRATEGIES BY ACADEMIC PROGRAM

### 10.1 WOMEN AND CHILDREN'S HEALTH

#### 10.1.1 Cluster Objectives & Workforce Targets

The program aims to improve the availability and coverage of women and children's health services in Rwanda by increasing the availability of qualified and competent providers in this service area.

Table 10.1.1.A National Health Workforce Targets | Women and Children's Health

Program Areas	National Health Workforce Target 2030
Midwifery (A1)	2621
Midwifery (A0)	1030
Midwifery (Master's)	39
Master of Nursing: Pediatrics	123
Master of Nursing: Neonatal	158
Physician: Obstetrics & Gynecology	270
Physician: Pediatrics	239

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

#### 10.1.2 Midwifery (A1)

##### 10.1.2.1 Objective & Workforce Targets

As of January 2020, Rwanda had an estimated 1314 midwives (A1) working in the public sector health workforce. Over the next 10 years, MOH aims to have 2621 midwives (A1) in the public sector by deploying them according to the facility staffing norms described below in Table 10.1.2.A.

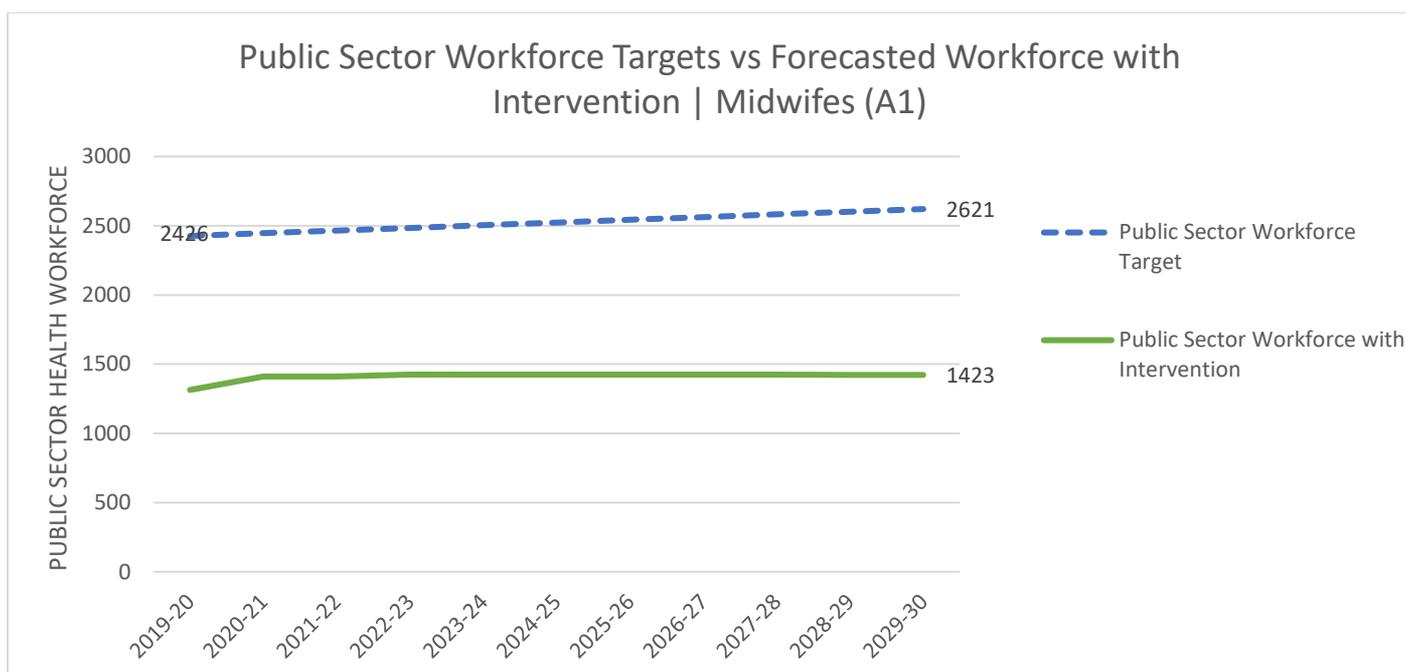
Table 10.1.2.A. National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Midwifery (A1)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	2.62	540	1415
District Hospital	~22.8	25	40	1000
Provincial Hospital	20.5	19	4	76
Referral Hospital	27	10	3	30
Teaching Hospital	n/a	25	4	100
<b>TOTAL</b>				<b>2621</b>

\*Current MOH Norms take into account both A1/A0 Midwifery programs

The Midwifery A1 program aims to contribute to achieving 45% of this public sector workforce target (1176 health workers out of a target of 2621); the expected contribution of the program toward achieving the national target is indicated in Figure 10.1.2.1.

Figure 10.1.2.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Midwifery (A1)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.1.2.2 Training Targets

In order to achieve the programmatic target of 1423 midwives (A1) in the public sector and achieve sustainability of the midwifery (A1) training program, the following enrollment and graduation scenario is planned (Table 10.1.2.B). The program aims to enroll 50 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 99% graduation rate, this will eventually lead to a total program enrollment of 150 students and yield roughly 50 graduates per year.

Table 10.1.2.B: Enrollment & Graduation Targets to Achieve Objectives | Midwifery (A1)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Total Enrollment	168	167	150	150	150	150	150	150	150	150	
Year 1 Intake	50	50	50	50	50	50	50	50	50	50	
Expected Graduates*	169	50	66	50	50	50	50	50	50	50	635

\*figures are rounded to match total as needed

### 10.1.2.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.1.2.C.

Table 10.1.2.C: Faculty Gaps and Requirements | Midwifery (A1)

Faculty*	Required	Currently Available	Gap
A0 Midwife	60	2	58
<b>TOTAL</b>	<b>60</b>	<b>2</b>	<b>58</b>

\*Faculty in midwifery will teach across A1/A0/Master's programs

It is proposed that 20 of the total gap of 58 faculty (34%) (Table 10.1.2.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty.

Table 10.1.2.D: Immediate Faculty Hiring Targets | Midwifery (A1)

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
A0 Midwifery	60	2	28	30
<b>TOTAL</b>	<b>60</b>	<b>2</b>	<b>28</b>	<b>30</b>

No study abroad nor visiting faculty are planned for the Midwifery (A1) program.

### 10.1.3 Midwifery (A0)

#### 10.1.3.1 Objective & Workforce Targets

As of January 2020, Rwanda had an estimated 123 midwives (A0) working in the public sector health workforce. Over the next 10 years, MOH aims to have 1030 midwives (A0) in the public sector by deploying them according to the facility staffing norms described below in Table 10.1.3.A.

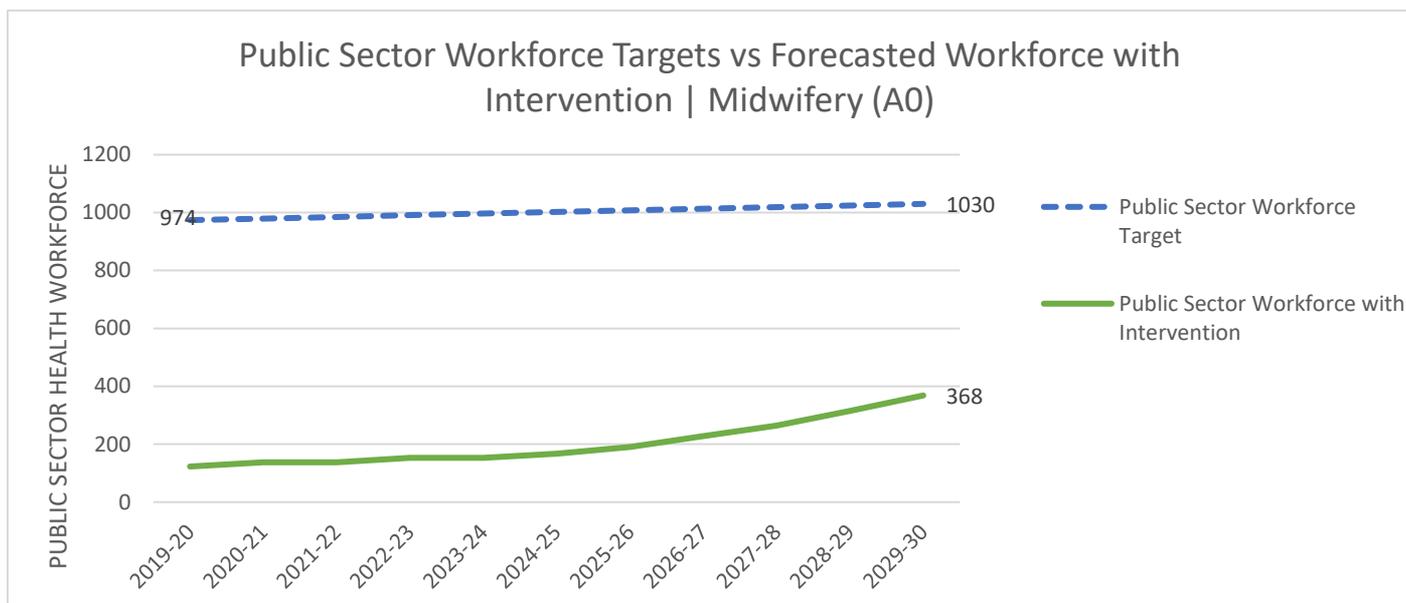
Table 10.1.3.A. National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Midwifery (A0)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	1	540	540
District Hospital	~22.8	5	40	200
Provincial Hospital	20.5	10	4	40
Referral Hospital	27	30	3	90
Teaching Hospital	n/a	40	4	160
<b>TOTAL</b>				<b>1030</b>

\*Current MOH Norms take into account both A1/A0 Midwifery programs

The Midwifery A0 program aims to contribute to achieving 36% of this public sector workforce target (368 health workers out of a target of 1030); the expected contribution of the program toward achieving the national target is indicated in Figure 10.1.3.1.

Figure 10.1.3.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Midwifery (A0)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.1.3.2 Training Targets

In order to achieve the programmatic target of 368 midwives (A0) in the public sector and achieve sustainability of the midwifery (A0) training program, the following enrollment and graduation scenario is planned (Table 10.1.3.B). The program aims to enroll 25 new upgrading and 100 new direct entry trainees every year, scaling up from 25 and 30 respectively per year in academic year 2021-22. By 2030, assuming a 99% graduation rate, this will eventually lead to a total program enrollment of 424 students and yield roughly 100 students per year.

Table 10.1.3.B: Enrollment & Graduation Targets to Achieve Objectives | Midwifery (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	49	80	110	160	209	254	299	349	399	424	
Year 4 Intake (A1-A0 Upgrade)	25	25	25	25	25	25	25	25	25	25	
Year 1 Intake (A0 Direct Entry)	0	30	30	50	50	75	75	100	100	100	
<b>Expected Graduates*</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>54</b>	<b>54</b>	<b>74</b>	<b>74</b>	<b>100</b>	<b>Total</b>
											<b>478</b>

\*figures are rounded to match total as needed

### 10.1.3.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.1.3.C.

Table 10.1.3.C: Faculty Gaps and Requirements | Midwifery (A0)

Faculty*	Required	Currently Available	Gap
Master of Midwifery	60	15	45
<b>TOTAL</b>	<b>60</b>	<b>15</b>	<b>45</b>

\*Faculty in midwifery will teach across A1/A0/Master's programs

There are no available providers who to fill immediate faculty gaps. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. There are no study abroad interventions planned to train faculty for Midwifery (A0); all faculty for the program will be trained in Rwanda.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.1.3.D indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.1.3.D: Total Visiting Faculty Needs (FTE) | Midwives (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	49	80	110	160	209	254	299	349	399	424
Master of Midwifery	10	10	10	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>0</b>						

## 10.1.4 Master of Midwifery

### 10.1.4.1 Objective & Workforce Targets

As of January 2020, Rwanda had an estimated 5 midwives (master's) working in the public sector health workforce. Over the next 10 years, MOH aims to have 47 midwives (master's) in the public sector by deploying them according to the facility staffing norms described below in Table 10.1.4.A

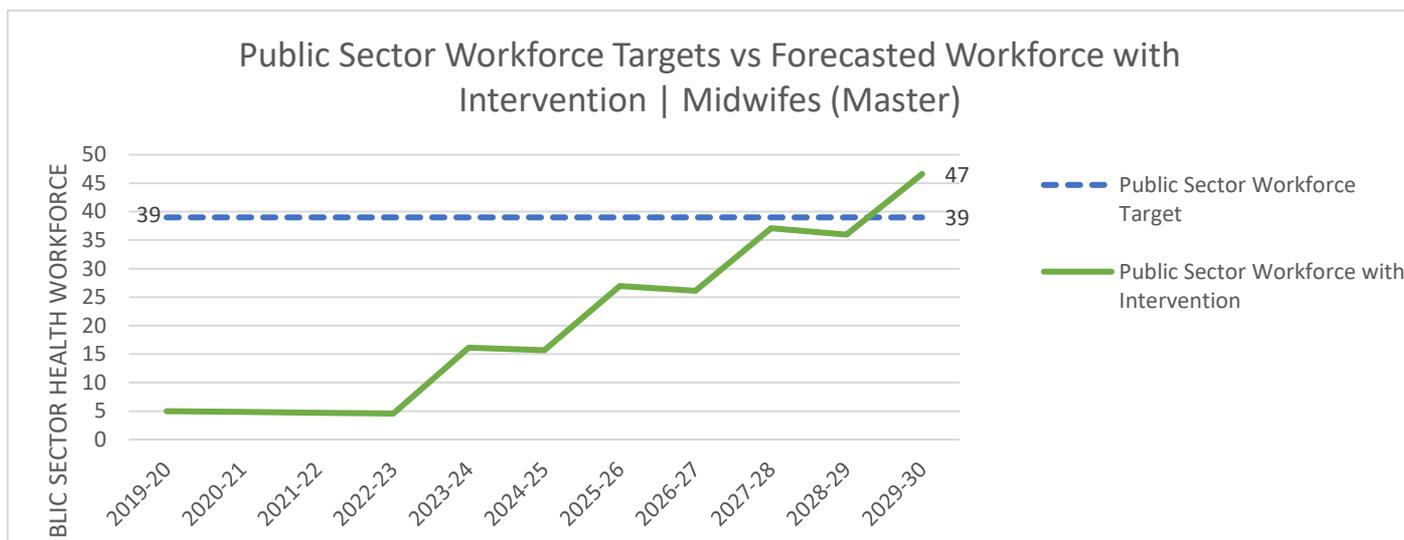
Table 10.1.4.A. National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Midwifery (Master's)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	~22.8	0	40	0
Provincial Hospital	20.5	1	4	4
Referral Hospital	27	5	3	15
Teaching Hospital	n/a	5	4	20
<b>TOTAL</b>				<b>39</b>

\*Current MOH Norms take into account both A1/A0 Midwifery programs

The midwifery (Master's) program aims to contribute to achieving 121% of this public sector workforce target (47 health workers out of a target of 39); the expected contribution of the program toward achieving the national target is indicated in Figure 10.1.4.1.

Figure 10.1.4.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Midwifery (Master's)



Note: forecasted workforce figures are estimated at close of fiscal year

#### 10.1.4.2 Training Targets

In order to achieve the programmatic target of 47 midwives (master’s) in the public sector and achieve sustainability of the midwifery (master’s) training program, the following enrollment and graduation scenario is planned (Table 10.1.4.B). The program aims to enroll 15 new trainees every other year, starting in academic year 2021-22. By 2030, assuming a 99% graduation rate, this will eventually lead to a total program enrollment of 15 students and yield roughly 15 graduates per year.

Table 10.1.4.B: Enrollment & Graduation Targets to Achieve Objectives | Midwifery (Master’s)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	0	15	15	15	15	15	15	15	15	15	
Year 1 Intake	0	15	0	15	0	15	0	15	0	15	<b>Total</b>
Expected Graduates*	0	0	0	14	0	15	0	15	0	15	<b>59</b>

\*figures are rounded to match total as needed

### 10.1.4.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.1.4.C.

Table 10.1.4.C: Faculty Gaps and Requirements | Midwifery (Master's)

Faculty*	Required	Currently Available	Gap
PhD – Midwifery	3	0	3
DNP Women's Health	3	0	3
PhD Neonatology	3	0	3
<b>TOTAL</b>	<b>9</b>	<b>0</b>	<b>9</b>

\*Faculty in midwifery will teach across A1/A0/Master's programs

Given there are no available specialists in Rwanda with the requisite expertise to fill these positions, it is proposed that 0 of the total gap of 9 faculty will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country.

While Rwanda has many generalists could serve as faculty, some will have to be sent abroad to gain the necessary qualification. To fulfill faculty requirements, Table 10.1.4.D indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.1.4.D: Total Study Abroad Needs | Midwifery (Master's)

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
PhD – Midwifery	4	0	0	0	0	0	0	0	0	0	0
DNP Women's Health	4	0	3	0	0	0	0	0	0	0	0
PhD Neonatology	4	0	3	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>6</b>	<b>0</b>							

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.1.4.E indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.1.4.E: Total Visiting Faculty Needs (FTE) | Midwives (Master’s)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	0	15	15	15	15	15	15	15	15	15
PhD – Midwifery	0	1	0	0	0	0	0	0	0	0
DNP Women's Health	0	3	3	3	3	0	0	0	0	0
PhD Neonatology	0	3	3	3	3	0	0	0	0	0
<b>TOTAL</b>	<b>0</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### 10.1.5 Midwifery Public Sector Entry and Retention

Midwives are a critical cadre in preventing maternal mortality and ensuring equitable access to care for those who need it the most. Special attention has been given during the planning process for each level of training for midwives— A1, A0, and Master’s.

Further interventions need to be planned to improve the public sector entry rate of graduates (currently, it is estimated that 79% of graduates will enter the public sector) and the public sector retention rate (currently, it is estimated that 3% of public sector midwives will leave their positions each year).

At these rates, it is estimated that by 2030 the total numbers of A1 midwives will decline 10% from 1314 to 1176 (owing in part to 250 A1 graduates entering A1-A0 upgrading); while the total number of midwives in the public sector will only increase by 11% from 1437 to 1591.

If interventions can be implemented to increase the public sector entry rate from 79% to 95%, and lower the public workforce attrition rate from 3% to 1%, then the number of A1 midwives over 10 years would increase by 16% from 1314 to 1521 and total number of midwives would increase by 45% from 1437 to 2059.

Further analysis of the current public sector entry rate of graduates and public sector attrition rate is needed, as well as root cause analysis to understand current challenges midwives face and potential mitigation strategies that could be proposed. Intervention areas that may be considered include revising public sector remuneration in comparison with private sector; financial and non-financial incentives and benefits; career progression pathways and tuition scholarships, including maintaining salary support or other benefits during studies; and public sector bonding schemes to repay tuition scholarships. This type of analysis would also benefit other cadres whose current pipeline does not achieve the public sector workforce target.

## 10.1.6 Master of Nursing: Pediatrics

### 10.1.6.1 Objective & Workforce Targets

As of January 2020, Rwanda had 10 Pediatric Nurses working in the public sector health workforce. Over the next 10 years, MOH aims to have 173 Pediatric Nurses in the public sector by deploying them according to the facility staffing norms described below in Table 10.1.6.A.

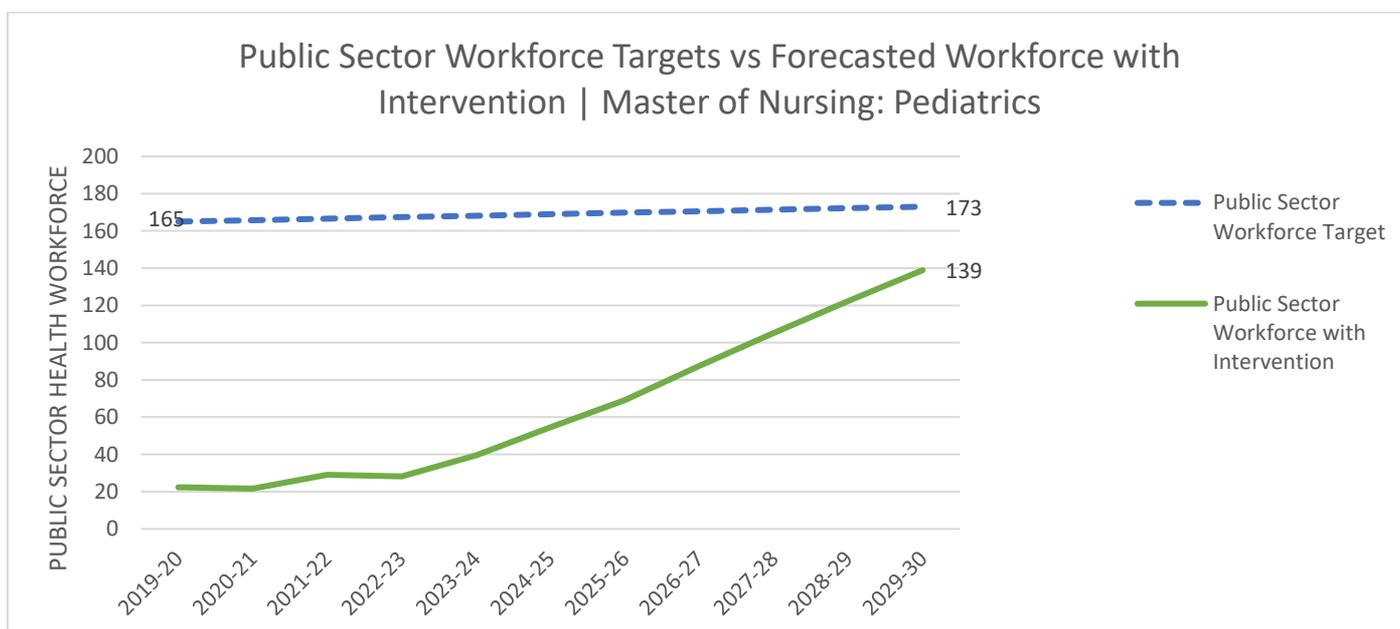
Table 10.1.6.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Master of Nursing: Pediatrics

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	n/a	2	40	80
Provincial Hospital	n/a	2	4	8
Referral Hospital	n/a	15	3	45
Teaching Hospital	n/a	10	4	40
<b>TOTAL</b>				<b>173</b>

\*MoH has not previously indicated norms or targets for specialized nurses

The Master of Nursing: Pediatrics program aims to contribute to achieving 80% of this public sector workforce target (139 health workers out of a target of 173); the expected contribution of the program toward achieving the national target is indicated in Figure 10.1.6.1.

Figure 10.1.6.1: Public Sector Health Workforce Targets vs. Forecasted Health Workforce Targets | Master of Nursing: Pediatrics



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.1.6.2 Training Targets

In order to achieve the programmatic target of 139 Pediatric Nurses in the public sector and achieve sustainability of Master of Nursing: Pediatrics training program, the following enrollment and graduation scenario is planned (Table 10.1.6.B). The program aims to enroll 25 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 25 students and yield roughly 23 graduates per year.

Table 10.1.6.B: Enrollment & Graduation Targets to Achieve Objectives | Master of Nursing: Pediatrics

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	10	15	34	39	44	49	49	49	49	49	
Year 1 Intake	0	15	20	20	25	25	25	25	25	25	<b>Total</b>
Expected Graduates*	0	9	0	14	18	18	22	22	23	23	<b>149</b>

\*figures are rounded to match total as needed

### 10.1.6.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.1.6.C.

Table 10.1.6.C: Faculty Gaps and Requirements | Master of Nursing: Pediatrics

Faculty	Required	Currently Available	Gap
Pediatrics Masters Nurse	4	2	2
PICU Nurse Masters	2	0	2
NICU Nurse Masters	2	0	2
Pediatrics PhD Nurse	2	0	2
<b>TOTAL</b>	<b>10</b>	<b>2</b>	<b>8</b>

\*MoH has not previously indicated norms or targets for specialized nurses

Given there are no available specialists in Rwanda with the requisite expertise to fill these positions, it is proposed that 0 of the total gap of 8 faculty (Table 10.1.6.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.1.6.D: Immediate Faculty Hiring Targets | Master of Nursing: Pediatrics

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Pediatrics Masters Nurse	4	2	0	2
PICU Nurse Masters	2	0	0	2
NICU Nurse Masters	2	0	0	2
Pediatrics PhD Nurse	2	0	0	2
<b>TOTAL</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>8</b>

\*MoH has not previously indicated norms or targets for specialized nurses

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications.

To fulfill faculty requirements, Table 10.1.6.DE indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.1.6.E: Total Study Abroad Needs | Master of Nursing: Pediatrics

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Pediatrics Masters Nurse	0	0	0	0	0	0	0	0	0	0	0
PICU Nurse Masters	3	0	2	0	0	0	0	0	0	0	0
NICU Nurse Masters	3	0	2	0	0	0	0	0	0	0	0
Pediatrics PhD Nurse	4	0	2	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>6</b>	<b>0</b>							

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.1.6.F: Total Visiting Faculty Needs (FTE) | Master of Nursing: Pediatrics

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	10	15	34	39	44	49	49	49	49	49
Visiting Pediatrics Masters Nurse Faculty	0	0	0	0	0	0	0	0	0	0
Visiting PICU Nurse Masters Faculty	1	1	2	2	0	0	0	0	0	0
Visiting NICU Nurse Masters Faculty	1	1	2	2	0	0	0	0	0	0
Visiting Pediatrics PhD Nurse Faculty	1	1	2	1	1	0	0	0	0	0
<b>TOTAL</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.1.7 Master of Nursing: Neonatal

### 10.1.7.1 Objective & Workforce Targets

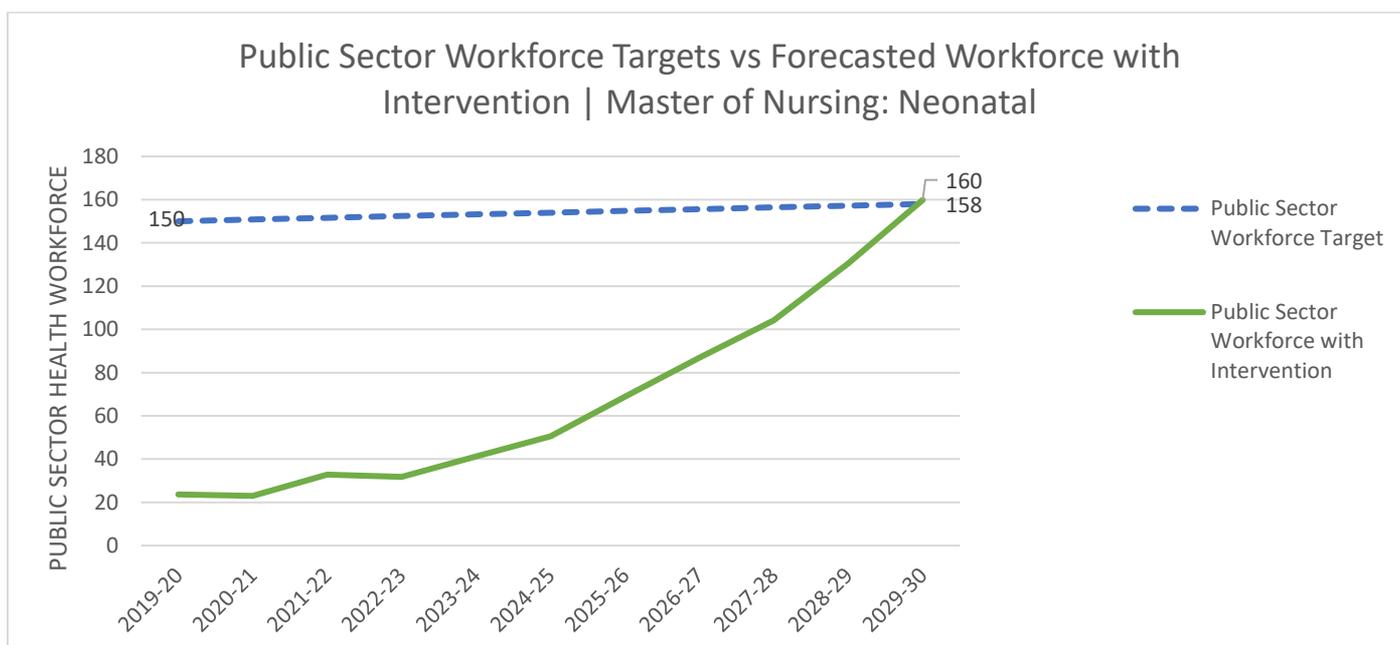
As of January 2020, Rwanda had 11 neonatal nurses working in the public sector health workforce. Over the next 10 years, MOH aims to have 158 neonatal nurses in the public sector by deploying them according to the facility staffing norms described below in Table 10.1.7.A.

Table 10.1.7.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Master of Nursing: Neonatal

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	n/a	2	40	80
Provincial Hospital	n/a	2	4	8
Referral Hospital	n/a	10	3	30
Teaching Hospital	n/a	10	4	40
<b>TOTAL</b>				<b>158</b>

The Master of Nursing Neonatology program aims to contribute to achieving 101% of this public sector workforce target (160 health workers out of a target of 158); the expected contribution of the program toward achieving the national target is indicated in Figure 10.1.7.1.

Figure 10.1.7.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Master of Nursing: Neonatal



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.1.7.2 Training Targets

In order to achieve the programmatic target of 160 neonatal nurses in the public sector and achieve sustainability of the Master of Nursing: Neonatal training program, the following enrollment and graduation scenario is planned. The program aims to enroll 35 new trainees every year by academic year 2027-28. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 69 students and yield roughly 33 graduates per year

Table 10.1.7.B. Enrollment & Graduation Targets to Achieve Objectives | Master of Nursing: Neonatal

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	11	11	22	32	41	41	51	65	69	69	
Year 1 Intake	0	11	11	21	21	21	31	35	35	35	Total
<b>Expected Graduates*</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>11</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>30</b>	<b>33</b>	<b>154</b>

\*figures are rounded to match total as needed

### 10.1.7.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.1.7.C.

Table 10.1.7.C: Faculty Gaps and Requirements | Master of Nursing: Neonatal

Faculty	Required	Currently Available	Gap
Master Neonatal Nurse	8	3	5
DNP Neonatal Nurse	3	0	3
PhD Neonatal Nurse	3	0	3
<b>TOTAL</b>	<b>14</b>	<b>3</b>	<b>11</b>

Given there are no available specialists in Rwanda with the requisite expertise to fill these positions, it is proposed that 0 of the total gap of 11 faculty (Table 10.1.7.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.1.7.D: Immediate Faculty Hiring Targets | Master of Nursing: Neonatal

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Master Neonatal Nurse	8	3	0	5
DNP Neonatal Nurse	3	0	0	3
PhD Neonatal Nurse	3	0	0	3
<b>TOTAL</b>	<b>14</b>	<b>3</b>	<b>0</b>	<b>11</b>

While Rwanda has graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications. To fulfill faculty requirements, Table.10.1.7.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.1.7.E: Total Study Abroad Needs | Master of Nursing: Neonatal

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Master Neonatal Nurse	3	0	0	0	0	0	0	0	0	0	0
DNP Neonatal Nurse	3	0	3	0	0	0	0	0	0	0	0
PhD Neonatal Nurse	4	0	3	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>6</b>	<b>0</b>							

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.1.7.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.1.7.F: Total Visiting Faculty Needs (FTE) | Master of Nursing: Neonatal

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	11	11	22	32	41	41	51	65	69	69
Visiting Master Neonatal Nurse Faculty	0	0	0	0	0	0	0	0	0	0
Visiting DNP Neonatal Nurse Faculty	0.5	0.5	0.5	1	0	0	0	0	0	0
Visiting PhD Neonatal Nurse Faculty	1	1	1	2	2	0	0	0	0	0
<b>TOTAL</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.1.8 Physician: Obstetrics & Gynecology

### 10.1.8.1 Objective & Workforce Targets

As of January 2020, Rwanda had 57 Obstetrics & Gynecology Physicians working in the public sector health workforce. Over the next 10 years, MOH aims to have 270 Obstetrician/Gynecologists in the public sector by deploying them according to the facility staffing norms described below in Table 10.1.8.A.

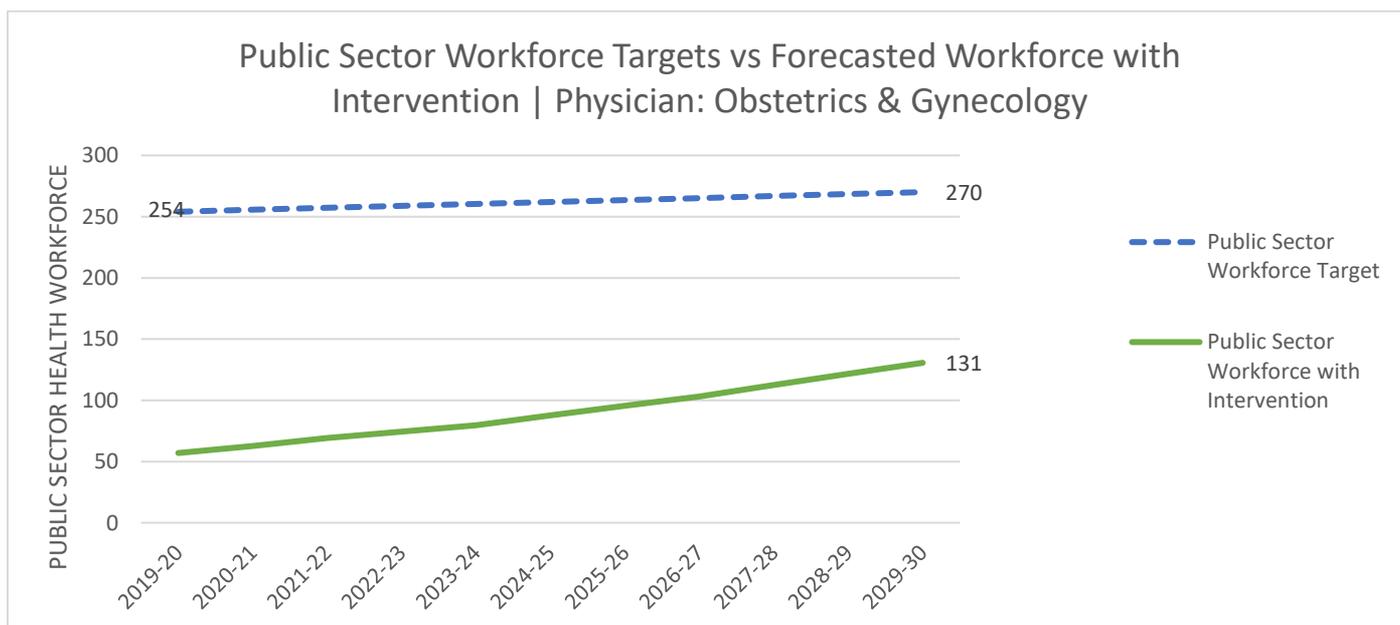
Table 10.1.8.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Obstetrics & Gynecology

Facility Level	MOH Norm - Current*	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	6	4	40	160
Provincial Hospital	10	4	4	16
Referral Hospital	11	10	3	30
Teaching Hospital	n/a	16	4	64
<b>TOTAL</b>				<b>270</b>

\*Unspecified distribution between General Surgery, Internal Medicine, Ob-Gyn, Pediatrics, Anesthesiology

The Obstetrics & Gynecology program aims to contribute to achieving 49% of this public sector workforce target (131 health workers out of a target of 270); the expected contribution of the program toward achieving the national target is indicated in Figure 10.1.8.1.

Figure 10.1.8.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Obstetrics & Gynecology



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.1.8.2 Training Targets

In order to achieve the programmatic target of 131 Obstetric & Gynecology Physicians in the public sector and achieve sustainability of the Obstetrics & Gynecology training program, the following enrollment and graduation scenario is planned (Table 10.1.8.B). The program aims to enroll 18 new trainees every year, starting in academic year 2023-24.

By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 69 students and yield roughly 16 graduates per year.

Table 10.1.8.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Obstetrics & Gynecology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	47	50	54	61	64	67	69	69	69	69	
Year 1 Intake	15	15	15	18	18	18	18	18	18	18	<b>Total</b>
Expected Graduates*	9	11	9	10	14	14	14	16	16	16	<b>129</b>

\*figures are rounded to match total as needed

### 10.1.8.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.1.8.C.

Table 10.1.8.C: Faculty Gaps and Requirements | Physician: Obstetrics & Gynecology

Faculty	Required	Currently Available	Gap
General Ob-Gyn	20	4	16
Gynecologic Oncology	2	0	2
Minimally invasive surgery	2	0	2
Maternal Fetal Medicine	2	0	2
Uro-gynecology and pelvic reconstruction surgery	2	0	2
Reproductive endocrinology and infertility	2	0	2
<b>TOTAL</b>	<b>30</b>	<b>4</b>	<b>26</b>

It is proposed that 8 of the total gap of 26 faculty (Table 10.1.8.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.1.8.D: Immediate Faculty Hiring Targets | Physician: Obstetrics & Gynecology

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General Ob-Gyn	20	4	7	9
Gynecologic Oncology	2	0	0	2
Minimally invasive surgery	2	0	0	2
Maternal Fetal Medicine	2	0	1	1
Uro-gynecology and pelvic reconstruction surgery	2	0	0	2
Reproductive endocrinology and infertility	2	0	0	2
<b>TOTAL</b>	<b>30</b>	<b>4</b>	<b>8</b>	<b>18</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.1.8.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.1.8.E: Total Study Abroad Needs | Physician: Obstetrics & Gynecology

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General Ob-Gyn	0	0	0	0	0	0	0	0	0	0	0
Gynecologic Oncology	3	0	1	0	0	0	0	0	0	0	0
Minimally invasive surgery	3	0	1	1	0	0	0	0	0	0	0
Maternal Fetal Medicine	3	0	1	0	0	0	0	0	0	0	0
Uro-gynecology and pelvic reconstruction surgery	3	0	0	0	1	1	0	0	0	0	0
Reproductive endocrinology and infertility	3	0	1	1	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.1.8.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.1.8.F: Total Visiting Faculty Needs (FTE) | Physician: Obstetrics & Gynecology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	47	50	54	61	64	67	69	69	69	69
General Ob-Gyn	0	0	0	0	0	0	0	0	0	0
Gynecologic Oncology	0	0	0	1	0	0	0	0	0	0
Minimally invasive surgery	0.3	0.3	0.3	0.3	0	0	0	0	0	0
Maternal Fetal Medicine	0	0	0	0	0	0	0	0	0	0
Uro-gynecology and pelvic reconstruction surgery	0.3	0.3	0.3	0.5	0	0	0	0	0	0
Reproductive endocrinology and infertility	0.3	0.3	0.3	0.3	1	0	0	0	0	0
<b>TOTAL</b>	<b>0.9</b>	<b>0.9</b>	<b>0.9</b>	<b>2.1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.1.9 Physician: Pediatrics

### 10.1.9.1 Objective & Workforce Targets

As of January 2020, Rwanda had 75 Pediatric Physicians working in the public sector health workforce—an increase from 14 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 239 Pediatric

Physicians in the public sector by deploying them according to the facility staffing norms described below in Table 10.1.9.A.

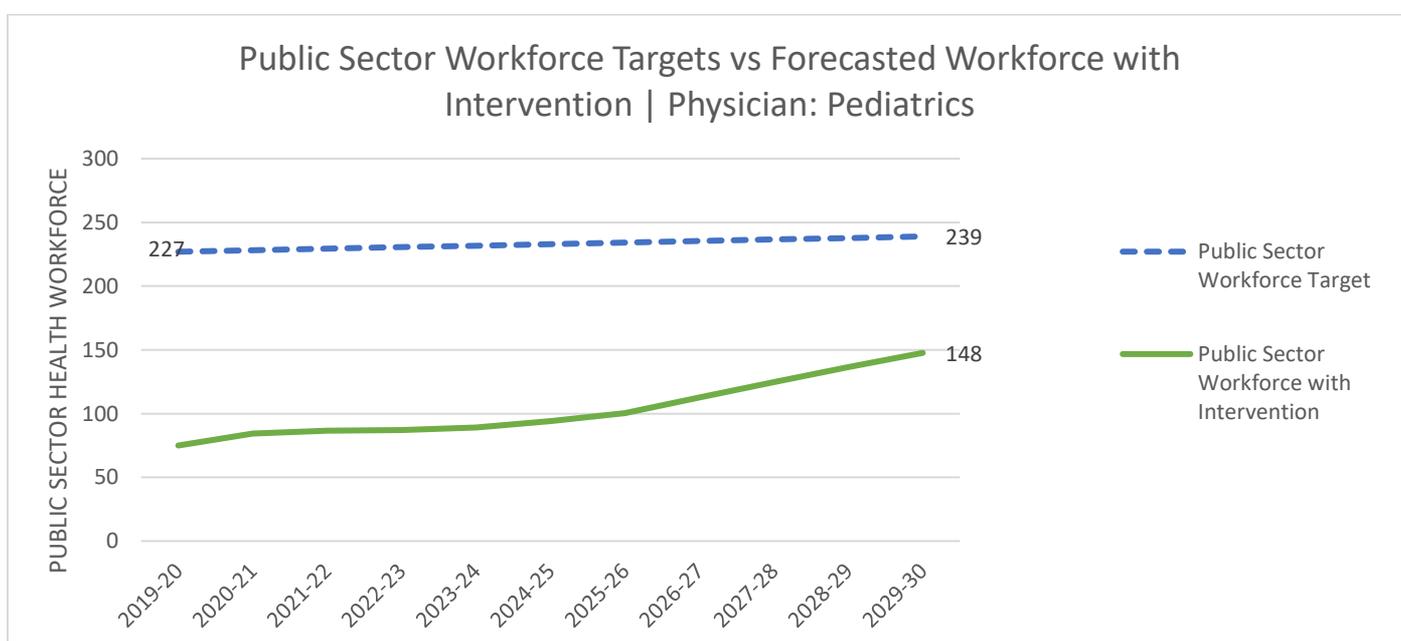
Table 10.1.9.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Pediatrics

Facility Level	MOH Norm - Current*	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	6	3	40	120
Provincial Hospital	10	3	4	12
Referral Hospital	11	9	3	27
Teaching Hospital	n/a	20	4	80
<b>TOTAL</b>				<b>239</b>

\*Unspecified distribution between General Surgery, Internal Medicine, Obstetrics/Gynecology, Pediatrics, Anesthesiology

The Pediatric Physician program aims to contribute to achieving 62% of this public sector workforce target (148 health workers out of a target of 239); the expected contribution of the program toward achieving the national target is indicated in Figure 10.1.9.1.

Figure 10.1.9.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Pediatrics



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.1.9.2 Training Targets

In order to achieve the programmatic target of 148 pediatricians in the public sector and achieve sustainability of the physician specialist in pediatrics training program, the following enrollment and graduation scenario is planned (Table 10.1.9.B). The program aims to enroll 20 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 77 students and yield roughly 18 graduates per year.

Table 10.1.9.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Pediatrics

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	25	31	47	60	70	77	77	77	77	77	
Year 1 Intake	10	12	20	20	20	20	20	20	20	20	<b>Total</b>
Expected Graduates*	14	5	4	5	9	11	18	18	18	18	<b>120</b>

\*figures are rounded to match total as needed

### 10.1.9.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.1.9.C.

Table 10.1.9.C: Faculty Gaps and Requirements | Physician: Pediatrics

Faculty	Required	Currently Available	Gap
General Pediatrics	12	3	9
Pediatric Gastro	2	0	2
Pediatric Nephrology	2	0	2
Pediatric Infectious Diseases	2	0	2
Pediatric Endocrinology	2	0	2
Pediatric Rheumatology	2	0	2
Pediatric Pulmonology	2	0	2
Pediatric Hemato-Oncology	2	0	2
Pediatric Neurology	2	0	2
Developmental & Behavioral Pediatrics	2	0	2
Pediatric Critical Care / Emergency Medicine	2	0	2
Neonatology	2	0	2
Adolescent Medicine	2	0	2
Pediatric Hospice/Palliative Care	2	0	2
Research methods/scholar	0	0	0
Pediatric Cardiology	2	1	1
<b>TOTAL</b>	<b>40</b>	<b>4</b>	<b>36</b>

It is proposed that 16 of the total gap of 36 faculty (40%) (Table 10.1.9.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.1.9.D: Immediate Faculty Hiring Targets | Physician: Pediatrics

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General Pediatrics	12	3	9	0
Pediatric Gastro	2	0	0	2
Pediatric Nephrology	2	0	1	1
Pediatric Infectious Diseases	2	0	0	2
Pediatric Endocrinology	2	0	1	1
Pediatric Rheumatology	2	0	0	2
Pediatric Pulmonology	2	0	0	2
Pediatric Hemato-Oncology	2	0	1	1
Pediatric Neurology	2	0	0	2
Developmental & Behavioral Pediatrics	2	0	0	2
Pediatric Critical Care / Emergency Medicine	2	0	0	2
Neonatology	2	0	2	0
Adolescent Medicine	2	0	0	2
Pediatric Hospice/Palliative Care	2	0	0	2
Research methods/scholar	0	0	0	0
Pediatric Cardiology	2	1	1	0
<b>TOTAL</b>	<b>40</b>	<b>4</b>	<b>15</b>	<b>21</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table.10.1.9.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.1.9.E: Total Study Abroad Needs | Physician: Pediatrics

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General Pediatrics	4	0	0	0	0	0	0	0	0	0	0
Pediatric Gastro	2	0	2	0	0	0	0	0	0	0	0
Pediatric Nephrology	2	0	1	0	0	0	0	0	0	0	0
Pediatric Infectious Diseases	2	0	2	0	0	0	0	0	0	0	0
Pediatric Endocrinology	2	0	0	1	0	0	0	0	0	0	0
Pediatric Rheumatology	2	0	0	2	0	0	0	0	0	0	0
Pediatric Pulmonology	2	0	0	0	2	0	0	0	0	0	0
Pediatric Hemato-Oncology	2	0	0	0	1	0	0	0	0	0	0
Pediatric Neurology	2	0	0	0	0	2	0	0	0	0	0
Developmental & Behavioral Pediatrics	2	0	0	0	0	2	0	0	0	0	0
Pediatric Critical Care / Emergency Medicine	2	0	0	0	0	2	0	0	0	0	0
Neonatology	2	0	2	0	0	0	0	0	0	0	0
Adolescent Medicine	2	0	0	0	0	2	0	0	0	0	0
Pediatric Hospice/Palliative Care	2	0	0	0	0	2	0	0	0	0	0
Research methods/scholar	2	0	0	0	0	0	0	0	0	0	0
Pediatric Cardiology	2	0	0	2	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>7</b>	<b>5</b>	<b>3</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table.10.1.9.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.1.9.F: Total Visiting Faculty Needs (FTE) | Physician: Pediatrics

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	25	31	47	60	70	77	77	77	77	77
Visiting General Pediatrics Faculty	0	0	0	0	0	0	0	0	0	0
Visiting Pediatric Gastro Faculty	0.17	0.17	0.17	0	0	0	0	0	0	0
Visiting Pediatric Nephrology Faculty	0	0	0	0	0	0	0	0	0	0
Visiting Pediatric Infectious Diseases Faculty	0.17	0.17	0.17	0	0	0	0	0	0	0
Visiting Pediatric Endocrinology Faculty	0	0	0	0	0	0	0	0	0	0
Visiting Pediatric Rheumatology Faculty	0.17	0.17	0.17	0.33	0	0	0	0	0	0
Visiting Pediatric Pulmonology Faculty	1	1	1	1	1	0	0	0	0	0
Visiting Pediatric Hemato-Oncology Faculty	0.17	0.17	0.17	0.33	0.33	0.33	0	0	0	0
Visiting Pediatric Neurology Faculty	0.17	0.17	0.17	0.33	0.33	0.33	0	0	0	0
Visiting Developmental & Behavioral Pediatrics Faculty	0.17	0.17	0.17	0.33	0.33	0.33	0	0	0	0
Visiting Pediatric Critical Care / Emergency Medicine Faculty	0.17	0.17	0.17	0.33	0.33	0.33	0	0	0	0
Visiting Neonatology Faculty	0	0	0	0	0	0	0	0	0	0
Visiting Pediatric Cardiology Faculty	0	0	0	0	0	0	0	0	0	0
Visiting Adolescent Medicine	0.17	0.17	0.17	0.34	0.34	0.34	0	0	0	0
Visiting Research and Palliative Care	0.17	0.17	0.17	0.34	0.34	0.34	0	0	0	0
Visiting Research Methods/Scholars	0	0	0	0	0	0	0	0	0	0
Visiting Pediatric Cardiology	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>2.53</b>	<b>2.53</b>	<b>2.53</b>	<b>3.33</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.2 MEDICINE AND NON-COMMUNICABLE DISEASES

### 10.2.1 Cluster Objectives & Workforce Targets

The program aims to improve the availability and coverage of 3 services in Rwanda by increasing the availability of qualified and competent providers in this service area.

Table 10.2.1.A National Health Workforce Targets | Medicine and Non-Communicable Diseases

Program Areas	National Health Workforce Target 2030
Perfusion Medicine	16
Master of Nursing: Nephrology	38
Physician: Internal Medicine	266

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

### 10.2.2 Clinical Perfusion Technology

MOH aims to have 16 Clinical Perfusion Technologists working in the public health sector by 2030.

Table 10.2.2.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Clinical Perfusion Technologist

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Central Hospital	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	0	40	0
Provincial Hospital	<i>n/a</i>	0	4	0
Referral Hospital	<i>n/a</i>	0	3	0
Teaching Hospital	<i>n/a</i>	4	4	16
<b>TOTAL</b>				<b>16</b>

Strategies to scale and strengthen the Clinical Perfusion Technology program will be developed in the course of implementation of the National Strategy for Health Professions Development (2030).

### 10.2.3 Master of Nursing: Nephrology

#### 10.2.3.1 Objective & Workforce Targets

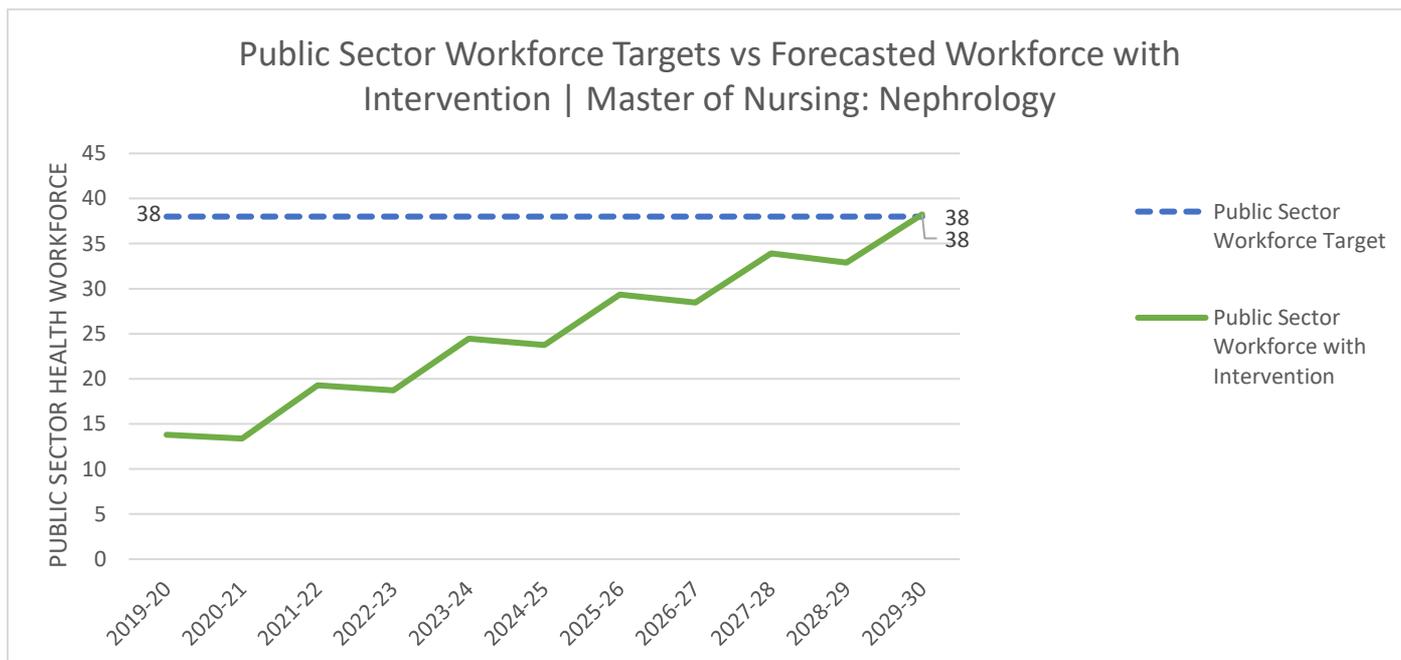
As of January 2020, Rwanda had 7 nephrology nurses working in the public sector health workforce. Over the next 10 years, MOH aims to have 38 nephrology nurses in the public sector by deploying them according to the facility staffing norms described below in Table 10.2.3.A.

Table 10.2.3.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Master of Nursing: Nephrology

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	n/a	0	40	0
Provincial Hospital	n/a	0	4	0
Referral Hospital	n/a	2	3	6
Teaching Hospital	n/a	8	4	32
<b>TOTAL</b>				<b>38</b>

The Master of Nursing: Nephrology program aims to contribute to achieving 100% of this public sector workforce target (38 health workers out of a target of 38); the expected contribution of the program toward achieving the national target is indicated in Figure 10.2.3.1.

Figure 10.2.3.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Master of Nursing: Nephrology



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.2.3.2 Training Targets

In order to achieve the programmatic target of 38 nephrology nurses in the public sector and achieve sustainability of the Masters of Nursing: Nephrology training program, the following enrollment and graduation scenario is planned (Table 10.2.3.B). The program aims to enroll 7 new trainees every year, starting in academic year 2020-21. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 7 students and yield roughly 6 graduates per year.

Table 10.2.3.B: Enrollment & Graduation Targets to Achieve Objectives | Master of Nursing: Nephrology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	7	7	7	7	7	7	7	7	7	7	
Year 1 Intake	0	7	0	7	0	7	0	7	0	7	<b>Total</b>
Expected Graduates*	0	6	0	6	0	6	0	7	0	7	<b>32</b>

\*figures are rounded to match total as needed

### 10.2.3.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.2.3.C.

Table 10.2.3.C: Faculty Gaps and Requirements | Master of Nursing: Nephrology

Faculty	Required	Currently Available	Gap
PhD Nephrology Nursing	1	0	1
Masters Nephrology Nursing	2	3	0
<b>TOTAL</b>	<b>3</b>	<b>3</b>	<b>1</b>

Given there are no available specialists in Rwanda with the requisite expertise to fill these positions, it is proposed that 0 of the total gap of 1 faculty (Table 10.2.3.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required faculty positions.

Table 10.2.3.D: Immediate Faculty Hiring Targets | Master of Nursing: Nephrology

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
PhD Nephrology Nursing	1	0	0	1
Masters Nephrology Nursing	2	3	0	0
<b>TOTAL</b>				<b>1</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications. To fulfill faculty requirements, Table 10.2.3.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.2.3.E: Total Study Abroad Needs | Master of Nursing: Nephrology

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
PhD Nephology Nursing		0	0	0	0	0	0	0	0	0	0
Masters Nephrology Nursing		0	0	0	0	0	0	0	0	0	0

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.2.3.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.2.3.F: Total Visiting Faculty Needs (FTE) | Master of Nursing: Nephrology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	7	7	7	7	7	7	7	7	7	7
Faculty	0	0	0	0	0	0	0	0	0	0
PhD Nephrology Nursing Faculty	1	1	1	0	0	0	0	0	0	0
Masters Nephrology Nursing Faculty	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>						

## 10.2.4 Physician: Internal Medicine

### 10.2.4.1 Objective & Workforce Targets

As of January 2020, Rwanda had 91 internal medicine physicians working in the public sector health workforce—an increase from 12 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 186 internal medicine physicians in the public sector by deploying them according to the facility staffing norms described below in Table 10.2.4.A.

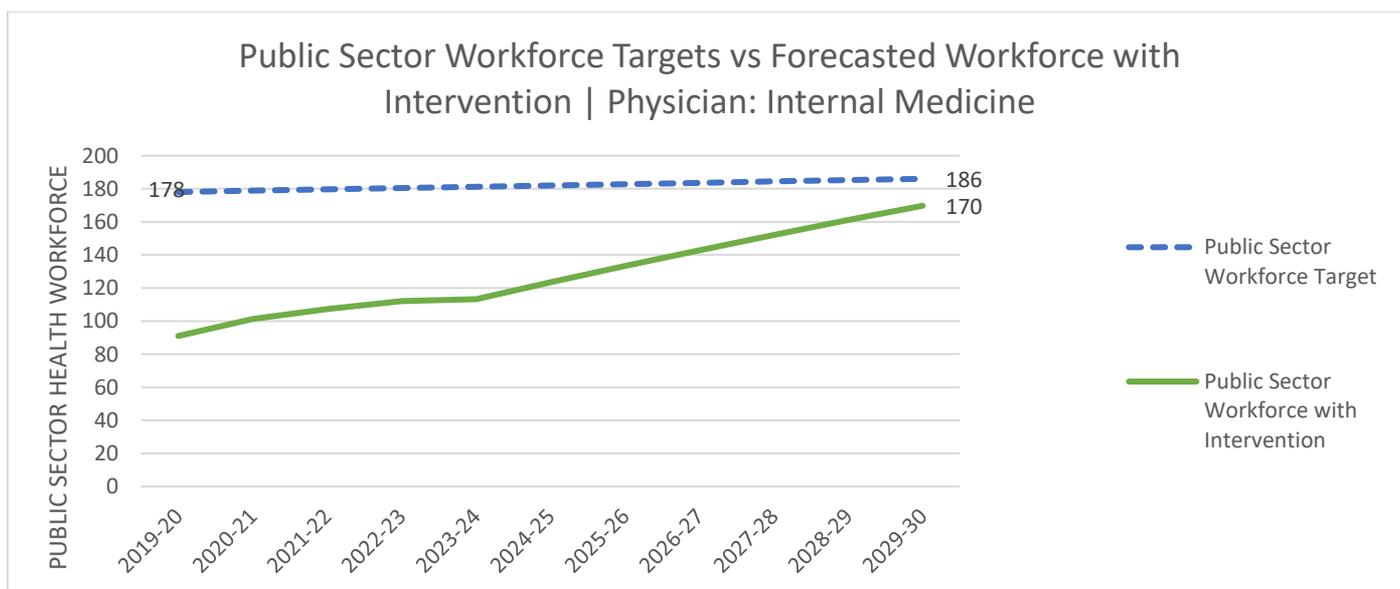
Table 10.2.4.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Internal Medicine

Facility Level	MOH Norm - Current*	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	6	2	40	80
Provincial Hospital	10	6	4	24
Referral Hospital	11	6	3	18
Teaching Hospital	n/a	16	4	64
<b>TOTAL</b>				<b>186</b>

\*Unspecified distribution between General Surgery, Internal Medicine, Ob-Gyn, Pediatrics, Anesthesiology

The Physician: Internal Medicine program aims to contribute to achieving 95% of this public sector workforce target (170 health workers out of a target of 186); the expected contribution of the program toward achieving the national target is indicated in Figure 10.2.4.1.

Figure 10.2.4.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Internal Medicine



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.2.4.2 Training Targets

In order to achieve the programmatic target of 170 internal medicine physicians in the public sector and achieve sustainability of the Internal Medicine training program, the following enrollment and graduation scenario is planned (Table 10.2.4.B). The program aims to enroll 15 new trainees every year, starting in academic year 2021-22. By 2030,

assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 59 students and yield roughly 15 graduates per year.

Table 10.2.4.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Internal Medicine

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	39	44	50	59	59	59	59	59	59	59	
Year 1 Intake	15	15	15	15	15	15	15	15	15	15	<b>Total</b>
Expected Graduates*	14	10	9	5	14	14	14	15	15	15	<b>125</b>

\*figures are rounded to match total as needed

### 10.2.4.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.2.4.C.

Table 10.2.4.C: Faculty Gaps and Requirements | Physician: Internal Medicine

Faculty	Required	Currently Available	Gap
General IM	15	5	10
Cardiology/Echocardiography	2	0	2
GI	2	0	2
Hematology	2	1	1
Rheumatology	2	0	2
Pulmonology	2	0	2
Neurology	2	0	2
Nephrology	2	0	2
Oncology	2	0	2
Infectious Diseases	2	0	2
Endocrinology	2	1	1
Palliative Care	2	0	2
Geriatrics	2	1	1
<b>TOTAL</b>	<b>39</b>	<b>8</b>	<b>31</b>

It is proposed that 18 of the total gap of 31 faculty (Table 10.2.4.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.2.4.D: Immediate Faculty Hiring Targets | Physician: Internal Medicine

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General IM	15	5	9	1
Cardiology/Echocardiography	2	0	2	0
GI	2	0	0	2
Hematology	2	1	0	1
Rheumatology	2	0	0	2
Pulmonology	2	0	1	1
Neurology	2	0	2	0
Nephrology	2	0	2	0
Oncology	2	0	2	0
Infectious Diseases	2	0	0	2
Endocrinology	2	1	0	1
Palliative Care	2	0	0	2
Geriatrics	2	1	0	1
<b>TOTAL</b>	<b>39</b>	<b>8</b>	<b>18</b>	<b>13</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.2.4.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.2.4.E: Total Study Abroad Needs | Physician: Internal Medicine

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General IM	4	0	0	0	0	0	0	0	0	0	0
Cardiology/Echocardiography	2	0	0	0	0	0	0	0	0	0	0
GI	2	0	1	1	0	0	0	0	0	0	0
Hematology	2	0	0	1	0	0	0	0	0	0	0
Rheumatology	2	0	1	0	1	0	0	0	0	0	0
Pulmonology	2	0	0	0	0	0	0	0	0	0	0
Neurology	2	0	0	0	0	0	0	0	0	0	0
Nephrology	2	0	0	0	0	0	0	0	0	0	0
Oncology	2	0	0	0	0	0	0	0	0	0	0
Infectious Diseases	2	0	1	0	1	0	0	0	0	0	0
Endocrinology	2	0	0	1	0	0	0	0	0	0	0
Palliative Care	0	0	1	0	1	0	0	0	0	0	0
Geriatrics	2	0	0	1	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.2.4.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.2.4.F: Total Visiting Faculty Needs (FTE) | Physician: Internal Medicine

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	39	44	50	59	59	59	59	59	59	59
Visiting General IM	0	0	0	0	0	0	0	0	0	0
Visiting Cardiology/Echocardiography	0	0	0	0	0	0	0	0	0	0
Visiting GI	0.2	0.2	0.3	0.2	0	0	0	0	0	0
Visiting Hematology	0	0	0	0	0	0	0	0	0	0
Visiting Rheumatology	0.2	0.2	0.3	0.2	0.2	0	0	0	0	0
Visiting Pulmonology	0	0	0	0	0	0	0	0	0	0
Visiting Neurology	0	0	0	0	0	0	0	0	0	0
Visiting Nephrology	0	0	0	0	0	0	0	0	0	0
Visiting Oncology	0	0	0	0	0	0	0	0	0	0
Visiting Infectious Diseases	0	0	0.2	0.2	0.2	0	0	0	0	0
Visiting Endocrinology	0	0	0.2	0.2	0	0	0	0	0	0
Visiting Palliative Care	0.2	0.2	0.3	0.2	0.2	0	0	0	0	0
Visiting Geriatrics	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>0.6</b>	<b>0.6</b>	<b>1.3</b>	<b>1</b>	<b>0.6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.2.5 Master of Nursing: Oncology

### 10.2.5.1 Objective & Workforce Targets

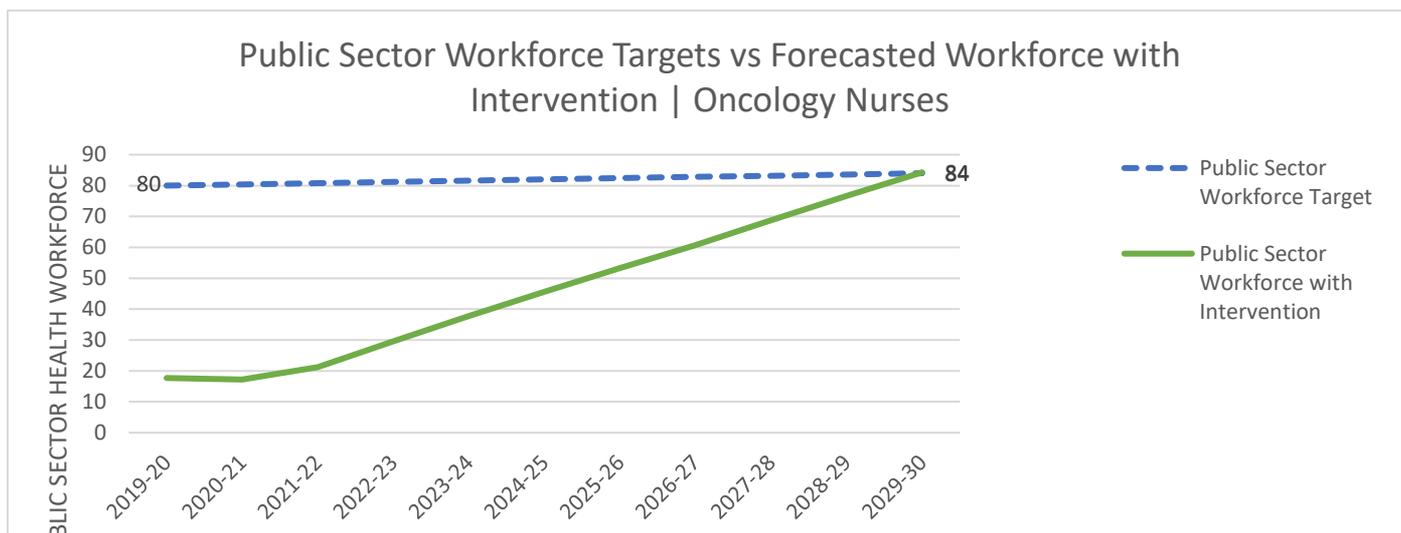
As of January 2020, Rwanda had 9 oncology nurses working in the public sector health workforce. Over the next 10 years, MOH aims to have 84 oncology nurses in the public sector by deploying them according to the facility staffing norms described below in Table 10.2.5.A.

Table 10.2.5.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Master of Nursing: Oncology

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	1	40	40
Provincial Hospital	<i>n/a</i>	2	4	8
Referral Hospital	<i>n/a</i>	4	3	12
Teaching Hospital	<i>n/a</i>	6	4	24
<b>TOTAL</b>				<b>84</b>

The Master of Nursing: Oncology program aims to contribute to achieving 100% of this public sector workforce target (84 health workers out of a target of 84); the expected contribution of the program toward achieving the national target is indicated in Figure 10.2.5.1

Figure 10.2.5.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Master of Nursing: Oncology



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.2.5.2 Training Targets

In order to achieve the programmatic target of 84 oncology nurses in the public sector and achieve sustainability of the Master of Nursing: Oncology training program, the following enrollment and graduation scenario is planned (Table 10.2.5.B). The program aims to enroll 11 new trainees every year by academic year 2025-26. By 2030, assuming a 100% graduation rate, this will eventually lead to a total program enrollment of 21 students and yield roughly 10 graduates per year.

Table 10.2.5.B: Enrollment & Graduation Targets to Achieve Objectives | Master of Nursing: Critical Care/Trauma

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Total Enrollment	15	20	20	20	20	21	21	21	21	21	
Year 1 Intake	10	10	10	10	10	11	11	11	11	11	
Expected Graduates*	0	5	9	9	9	9	9	9	10	10	<b>79</b>

\*figures are rounded to match total as needed

### 10.2.5.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.2.5.C.

Table 10.2.5.C: Faculty Gaps and Requirements | Master of Nursing: Critical Care/Trauma

Faculty	Required	Currently Available	Gap
Oncology Nurse Masters	3	2	1
Oncology Nurse PhD	1	0	1
<b>TOTAL</b>	<b>4</b>	<b>2</b>	<b>2</b>

It is proposed that 1 of the total gap of 2 faculty (Table 10.2.5.D/ Table 10.3.2.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to gain necessary qualifications.

Table 10.2.5.D: Immediate Faculty Hiring Targets | Master of Nursing: Oncology

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Oncology Nurse Masters	3	2	1	0
Oncology Nurse PhD	1	0	0	1
<b>TOTAL</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>1</b>

While Rwanda has many generalists, who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications. To fulfill faculty requirements, Table 10.2.5.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.2.5.E: Total Study Abroad Needs (FTE) | Master of Nursing: Oncology

Subspecialty Program	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Oncology Nurse Masters	2	0	0	0	0	0	0	0	0	0	0
Oncology Nurse PhD	4	0	1	0	0	0	0	0	0	0	0
<b>Total</b>	<i>n/a</i>	<b>0</b>	<b>1</b>	<b>0</b>							

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.2.5.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.2.5.F: Total Visiting Faculty Needs (FTE) | Master of Nursing: Oncology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	15	20	20	20	20	21	21	21	21	21
Oncology Nurse Masters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oncology Nurse PhD	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
<b>TOTAL</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

\*MoH has not previously indicated norms or targets for total program enrollment for oncology nurses

## 10.3 EMERGENCY MEDICINE

### 10.3.1 Cluster Objectives & Workforce Targets

The program aims to improve the availability and coverage of 2 services in Rwanda by increasing the availability of qualified and competent providers in this service area.

Table 10.3.1.A National Health Workforce Targets | Emergency Medicine

Program Areas	National Health Workforce Target 2030
Master of Nursing: Critical Care/Trauma	336
Physician: Emergency Medicine	74

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

#### 10.3.1.1 Master of Nursing: Critical Care/Trauma

### 10.3.2 Objective & Workforce Targets

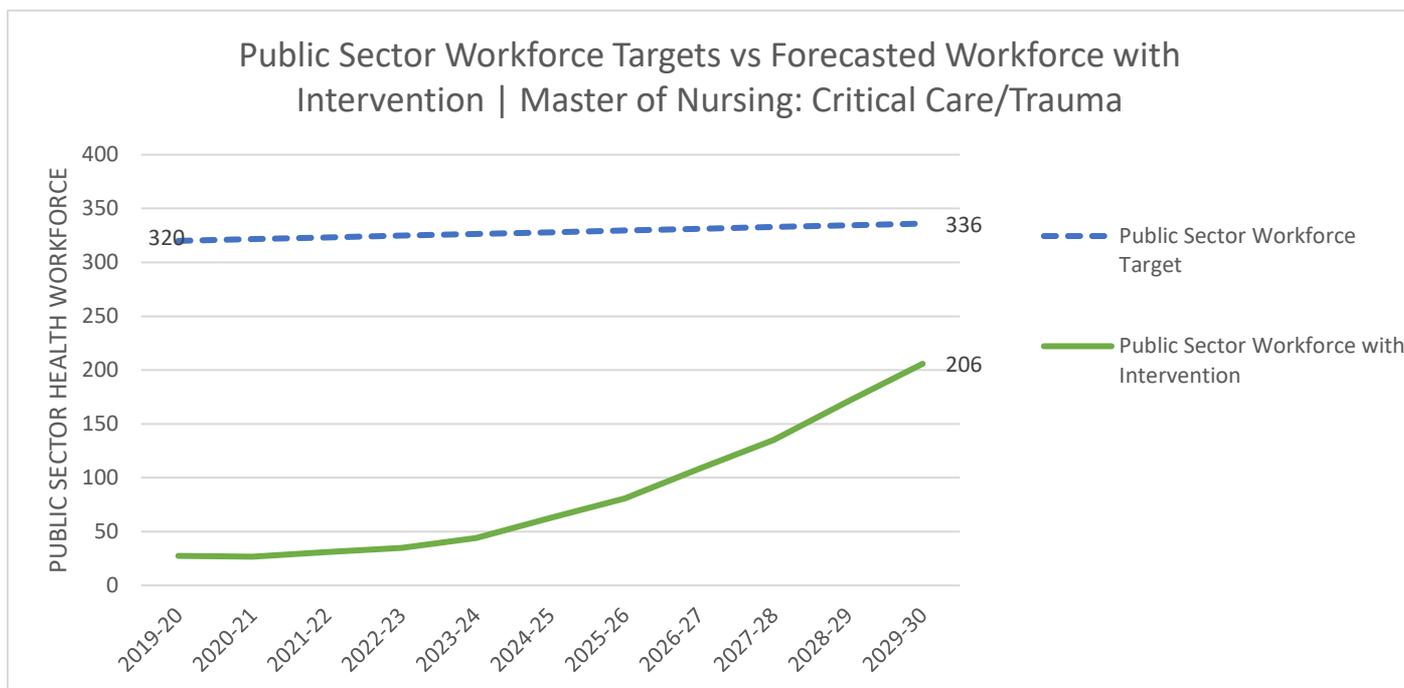
As of January 2020, Rwanda had 16 critical care/ trauma nurses working in the public sector health workforce. Over the next 10 years, MOH aims to have 336 critical care/ trauma nurses in the public sector by deploying them according to the facility staffing norms described below in Table 10.3.2.A.

Table 10.3.2.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Master of Nursing: Critical Care/Trauma

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	4	40	160
Provincial Hospital	<i>n/a</i>	10	4	40
Referral Hospital	<i>n/a</i>	12	3	36
Teaching Hospital	<i>n/a</i>	25	4	100
<b>TOTAL</b>				<b>336</b>

The Master of Nursing: Critical Care/Trauma program aims to contribute to achieving 61% of this public sector workforce target (206 health workers out of a target of 336); the expected contribution of the program toward achieving the national target is indicated in Figure 10.3.2.i.

Figure 10.3.2.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Master of Nursing: Critical Care/Trauma



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.3.2.1 Training Targets

In order to achieve the programmatic target of 206 critical care/ trauma nurses in the public sector and achieve sustainability of the Master of Nursing: Critical Care/Trauma training program, the following enrollment and graduation scenario is planned (Table 10.3.2.B). The program aims to enroll 40 new trainees every year by academic year 2026-27. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 80 students and yield roughly 40 graduates per year.

Table 10.3.2.B: Enrollment & Graduation Targets to Achieve Objectives | Master of Nursing: Critical Care/Trauma

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	10	15	30	40	50	60	70	80	80	80	
Year 1 Intake	5	10	20	20	30	30	40	40	40	40	<b>Total</b>
Expected Graduates*	0	5	5	10	20	20	30	30	40	40	<b>200</b>

\*figures are rounded to match total as needed

### 10.3.2.2 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table.10.3.2.C.

Table 10.3.2.C: Faculty Gaps and Requirements | Master of Nursing: Critical Care/Trauma

Faculty	Required	Currently Available	Gap
Master CCT Nurse	10	2	8
PhD Critical Care (ICU)	3	0	3
PhD Trauma Nursing	4	0	4
<b>TOTAL</b>	<b>17</b>	<b>2</b>	<b>15</b>

It is proposed that 5 of the total gap of 15 faculty (Table 10.3.2.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to gain necessary qualifications.

Table 10.3.2.D: Immediate Faculty Hiring Targets | Master of Nursing: Critical Care/Trauma

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Master CCT Nurse	10	2	5	3
PhD Critical Care (ICU)	3	0	0	3
PhD Trauma Nursing	4	0	0	4
<b>TOTAL</b>	<b>17</b>	<b>2</b>	<b>5</b>	<b>10</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications. To fulfill faculty requirements, Table 10.3.2.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.3.2.E: Total Study Abroad Needs (FTE) | Master of Nursing: Critical Care/Trauma

Subspecialty Program	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Master CCT Nurse	0	0	0	0	0	0	0	0	0	0	0
PhD Critical Care (ICU)	4	0	2	1	0	0	0	0	0	0	0
PhD Trauma Nursing	4	0	2	2	0	0	0	0	0	0	0
<b>Total</b>	<i>n/a</i>	<b>0</b>	<b>4</b>	<b>3</b>	<b>0</b>						

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.3.2.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.3.2.F: Total Visiting Faculty Needs (FTE) | Master of Nursing: Critical Care/Trauma

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	5	10	10	20	20	20	20	20	20	20
Master CCT Nurse	0	0	0	0	0	0	0	0	0	0
PhD Critical Care (ICU)	1	1	2	2	2	1	0	0	0	0
PhD Trauma nursing	1	2	2	3	1	0	0	0	0	0
<b>TOTAL</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*MoH has not previously indicated norms or targets for total program enrollment for Critical Care Trauma Nurses.

### 10.3.3 Physician: Emergency Medicine

#### 10.3.3.1 Objective & Workforce Targets

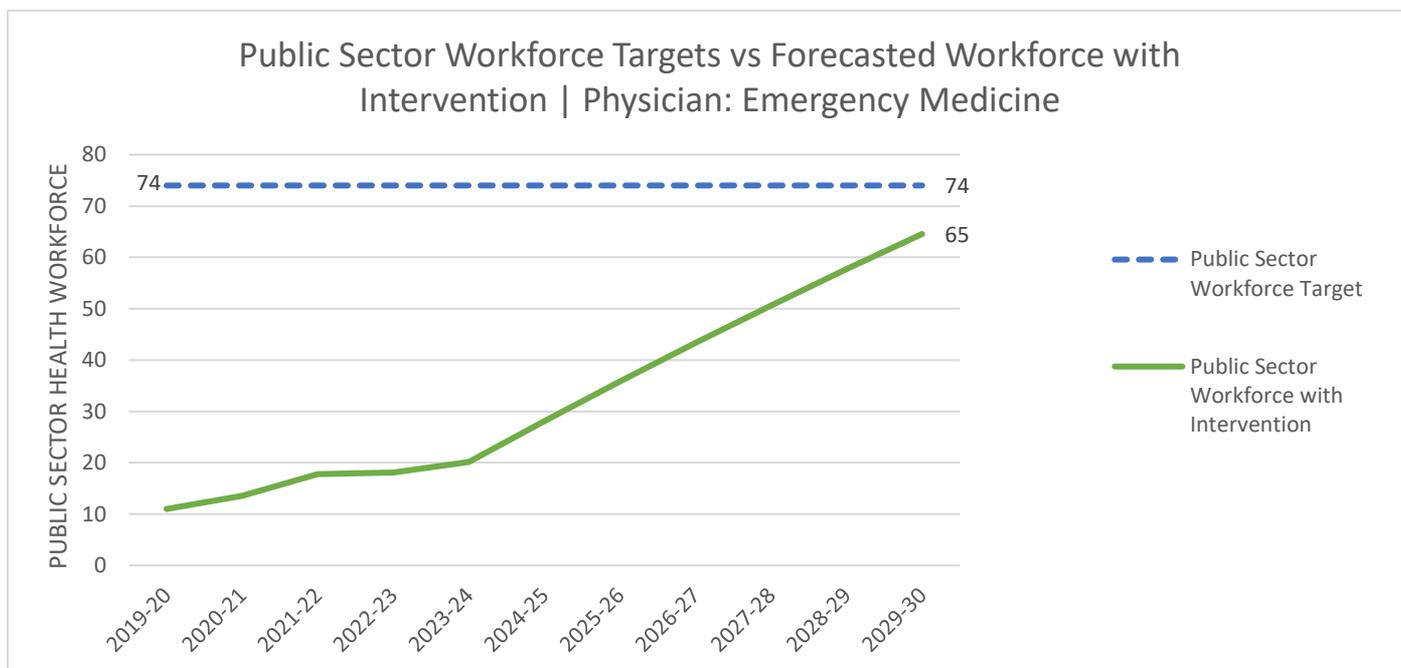
As of January 2020, Rwanda had 3 emergency medicine physicians working in the public sector health workforce—an increase from 0 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 74 emergency medicine physicians in the public sector by deploying them according to the facility staffing norms described below in Table 10.3.3.A.

Table 10.3.3.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Emergency Medicine

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center		0	540	0
District Hospital		0	40	0
Provincial Hospital		2	4	8
Referral Hospital		6	3	18
Teaching Hospital		12	4	48
<b>TOTAL</b>				<b>74</b>

The Physician: Emergency Medicine program aims to contribute to achieving 88% of this public sector workforce target (65 health workers out of a target of 74); the expected contribution of the program toward achieving the national target is indicated in Figure 10.3.3.1.

Figure 10.3.3.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Emergency Medicine



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.3.3.2 Training Targets

In order to achieve the programmatic target of 65 emergency medicine physicians in the public sector and achieve sustainability of the Emergency Medicine training program, the following enrollment and graduation scenario is planned (Table 10.3.3.B). The program aims to enroll 10 new trainees every year, starting in academic year 2020-21. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 38 students and yield roughly 9 graduates per year.

Table 10.3.3.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Emergency Medicine

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	19	23	32	38	38	38	38	38	38	38	
Year 1 Intake	10	10	10	10	10	10	10	10	10	10	<b>Total</b>
Expected Graduates*	3	5	1	3	8	8	8	8	9	9	<b>62</b>

\*figures are rounded to match total as needed

### 10.3.3.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table.10.3.3.C.

Table 10.3.3.C: Faculty Gaps and Requirements | Physician: Emergency Medicine

Faculty	Required	Currently Available	Gap
EM General	8	3	5
Critical care	2	0	2
EM Education/Scholar/Global Health/Clinical Research	2	0	2
EM Pediatrics	2	0	2
EM Service (Ambulance, etc.)	2	0	2
Medical toxicology	2	0	2
EM ultrasound (non-physician)	2	0	2
Anesthesiologist	2	0	2
<b>TOTAL</b>	<b>22</b>	<b>3</b>	<b>19</b>

It is proposed that 7 of the total gap of 19 faculty (Table 10.3.3.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.3.3.D: Immediate Faculty Hiring Targets | Physician: Emergency Medicine

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
EM General	8	3	4	1
Critical care	2	0	1	1
EM Education/Scholar/Global Health/Clinical Research	2	0	2	0
EM Pediatrics	2	0	0	2
EM Service (Ambulance, etc.)	2	0	0	2
Medical toxicology	2	0	0	2
EM ultrasound (non-physician)	2	0	0	2
Anesthesiologist	2	0	0	2
<b>TOTAL</b>	<b>22</b>	<b>3</b>	<b>7</b>	<b>12</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.3.3.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.3.3.E: Total Study Abroad Needs | Physician: Emergency Medicine

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
EM General	0	0	0	0	0	0	0	0	0	0	0
Critical care	2	0	1	0	0	0	0	0	0	0	0
EM education/scholar/global health/clinical research	2	0	0	0	0	0	0	0	0	0	0
EM pediatrics	2	0	1	1	0	0	0	0	0	0	0
EM Service (Ambulance, etc.)	2	0	1	0	1	0	0	0	0	0	0
Medical toxicology	3	0	1	0	1	0	0	0	0	0	0
EM ultrasound (non-physician)	2	0	2	0	0	0	0	0	0	0	0
Anesthesiologist	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.3.3.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.3.3.F: Total Visiting Faculty Needs (FTE) | Physician: Emergency Medicine

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	19	23	32	38	38	38	38	38	38	38
EM General	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Critical care	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EM education/scholar/global health/clinical research	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EM pediatrics	0.3	0.3	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0
EM Service (Ambulance, etc.)	0.3	0.3	0.7	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Medical toxicology	0.3	0.3	0.7	0.7	0.3	0.3	0.0	0.0	0.0	0.0
EM ultrasound (non-physician)	0.3	0.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anesthesiologist	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>TOTAL</b>	<b>1.2</b>	<b>1.2</b>	<b>3.1</b>	<b>1.3</b>	<b>0.6</b>	<b>0.3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.4 SURGERY/ANESTHESIA

### 10.4.1 Cluster Objectives & Workforce Targets

The program aims to improve the availability and coverage of 9 services in Rwanda by increasing the availability of qualified and competent providers in this service area.

Table 10.4.1.A National Health Workforce Targets | Surgery/Anesthesia

Program Areas	National Health Workforce Target 2030
Non-Physician Anesthetist (A0)	556
Master of Nursing: Medical Surgical	302
Master of Nursing: Perioperative	254
Physician: Anesthesiology	206
Physician: Otorhinolaryngology (ENT)	124
Physician: Surgery-General	140
Physician: Surgery-Neuro	30
Physician: Surgery-Orthopedic	60
Physician: Surgery-Urology	126

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

#### 10.4.2 Non-Physician Anesthetist (A0)

##### 10.4.2.1 Objective & Workforce Targets

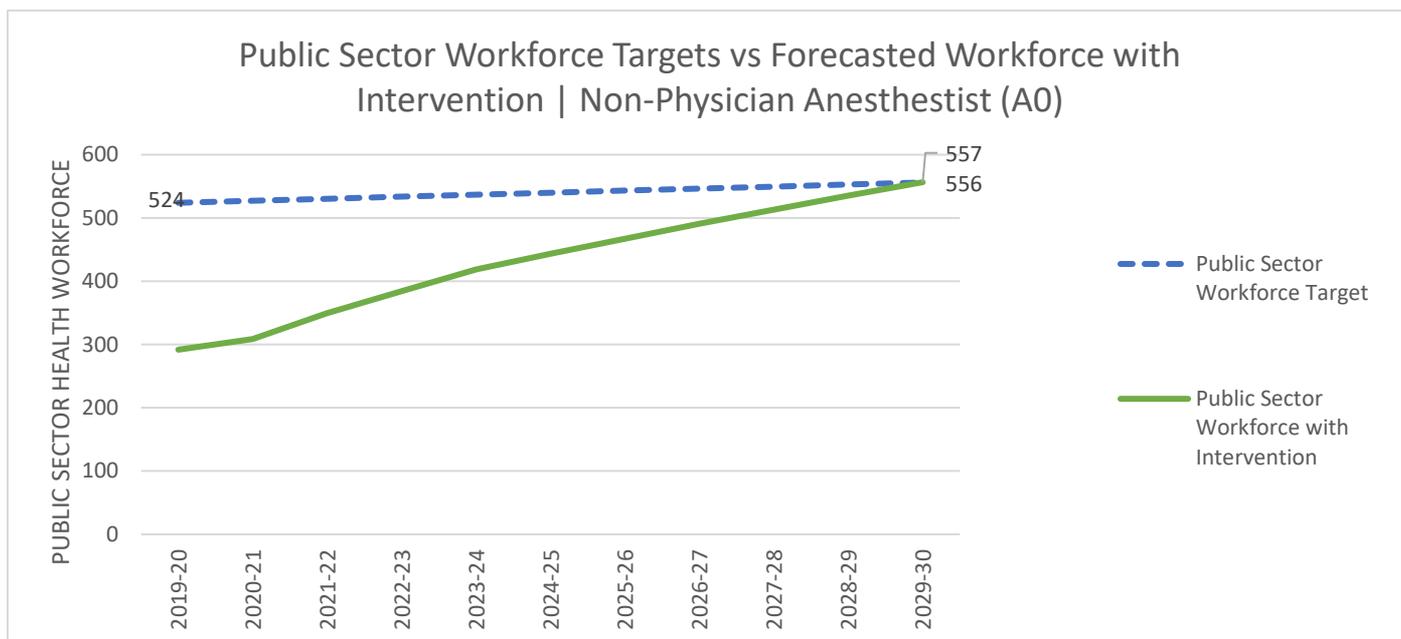
As of January 2020, Rwanda had 286 Non-Physician Anesthetists working in the public sector health workforce. Over the next 10 years, MOH aims to have non-physician Anesthetists in the public sector by deploying them according to the facility staffing norms described below in Table 10.4.2.A.

Table 10.4.2.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Non-Physician Anesthetist (A0)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	4	8	40	320
Provincial Hospital	4	10	4	40
Referral Hospital	4	12	3	36
Teaching Hospital	6	40	4	160
<b>TOTAL</b>				<b>556</b>

Non-Physician Anesthetist program aims to contribute to achieving 101% of this public sector workforce target (557 health workers out of a target of 556); the expected contribution of the program toward achieving the national target is indicated in Figure 10.4.2.1.

Figure 10.4.2.1: Public Sector Health Workforce Targets vs. Forecast of Workforce with Intervention | Non-Physician Anesthetist (A0)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.4.2.2 Training Targets

In order to achieve the programmatic target of 557 Non-Physician Anesthetists in the public sector and achieve sustainability of the Non-Physician Anesthetist (A0) training program, the following enrollment and graduation scenario is planned (Table 10.4.2.B). The program aims to enroll 25 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 116 students and yield roughly 23 graduates per year.

Table 10.4.2.B: Enrollment & Graduation Targets to Achieve Objectives Non-Physician Anesthetist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	150	135	126	116	116	116	116	116	116	116	
Year 1 intake (A1-A0 Upgrade)	20	20	20	20	20	20	20	20	20	20	
Year 1 Intake (Direct Entry)	25	25	25	25	25	25	25	25	25	25	<b>Total</b>
Expected Graduates*	38	50	51	42	42	42	42	42	42	43	<b>434</b>

\*figures are rounded to match total as needed

### 10.4.2.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table.10.4.2.C.

Table 10.4.2.C: Faculty Gaps and Requirements | Non-Physician Anesthetist (A0)

Faculty	Required	Currently Available	Gap
Anesthesiologist (physician)	3	1	2
Masters in Anesthesia	3	1	2
Master in CCTN	3	3	0
Local-regional	2	0	2
Pediatric anesthesia	2	0	2
Obstetric anesthesia	2	0	2
Neuro-anesthesia	2	0	2
<b>TOTAL</b>	<b>17</b>	<b>5</b>	<b>12</b>

It is proposed that 3 of the total gap of 12 faculty (Table 10.4.2.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required faculty positions.

Table 10.4.2.D: Immediate Faculty Hiring Targets | Non-Physician Anesthetist (A0)

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Anesthesiologist (physician)	3	1	2	0
Masters in Anesthesia	3	1	0	2
Master in CCTN	3	3	0	0
Local-regional	2	0	1	1
Pediatric anesthesia	2	0	0	2
Obstetric anesthesia	2	0	0	2
Neuroanesthesia	2	0	0	2
<b>TOTAL</b>	<b>17</b>	<b>5</b>	<b>3</b>	<b>9</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.4.2.E: Total Study Abroad Needs | Non-Physician Anesthetist (A0)

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Anesthesiologist (physician)	4	0	0	0	0	0	0	0	0	0	0
Masters in (Nurse) Anesthesia	2	0	2	0	0	0	0	0	0	0	0
Master in CCTN	2	0	0	0	0	0	0	0	0	0	0
Local-regional	2	0	1	0	0	0	0	0	0	0	0
Pediatric anesthesia	2	0	2	0	0	0	0	0	0	0	0
Obstetric anesthesia	2	0	2	0	0	0	0	0	0	0	0
Neuroanesthesia	2	0	2	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>9</b>	<b>0</b>							

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.4.2.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.4.2.F: Total Visiting Faculty Needs (FTE) | Non-Physician Anesthetist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	150	135	126	116	116	116	116	116	116	116
Anesthesiologist (physician)	0	0	0	0	0	0	0	0	0	0
Masters in (Nurse) Anesthesia	4	3	3	0	0	0	0	0	0	0
Master in CCTN	0	0	0	0	0	0	0	0	0	0
Local-regional	2	2	2	0	0	0	0	0	0	0
Pediatric anesthesia	3	3	3	0	0	0	0	0	0	0
Obstetric anesthesia	3	3	3	0	0	0	0	0	0	0
Neuroanesthesia	3	3	3	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>15</b>	<b>14</b>	<b>14</b>	<b>0</b>						

### 10.4.3 Master of Nursing: Medical Surgical

#### 10.4.3.1 Objective & Workforce Targets

As of January 2020, Rwanda had 18 medical surgical nurses working in the public sector health workforce. Over the next 10 years, MOH aims to have 302 medical surgical nurses in the public sector by deploying them according to the facility staffing norms described below in Table 10.4.3.A

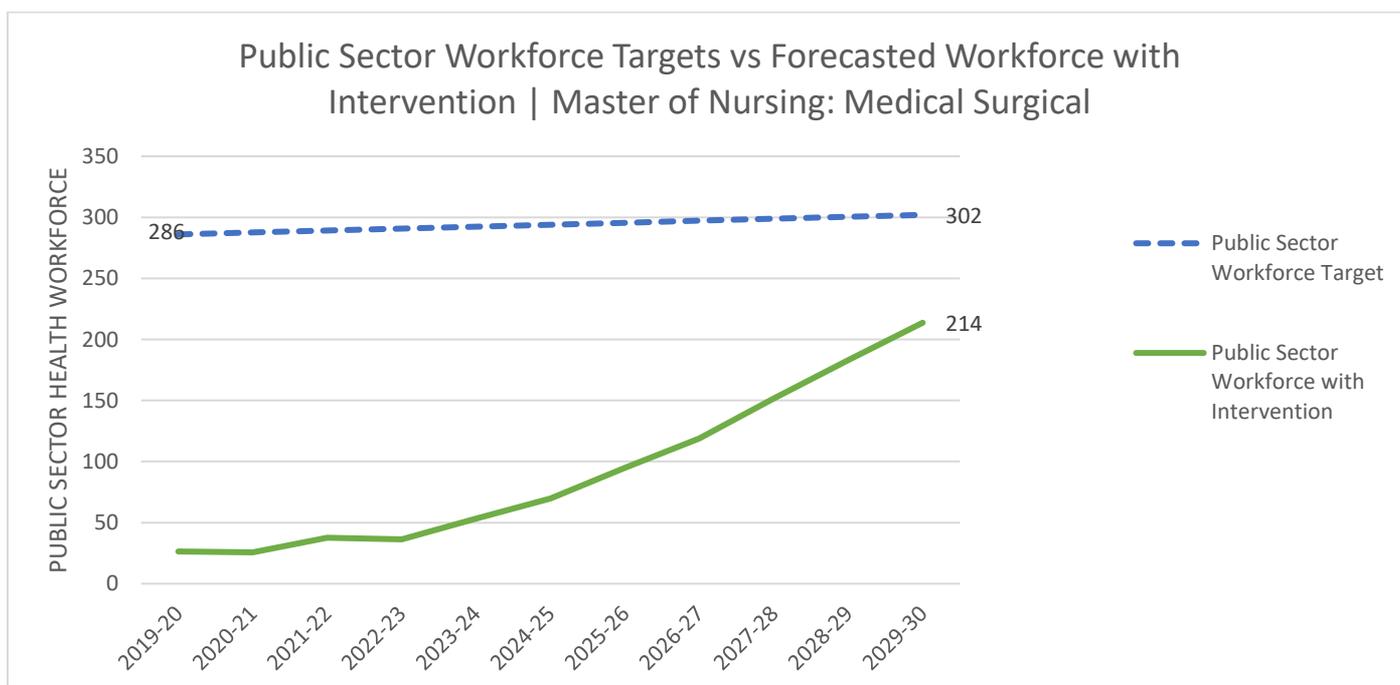
Table 10.4.3.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Master of Nursing: Medical Surgical

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	4	40	160
Provincial Hospital	<i>n/a</i>	8	4	32
Referral Hospital	<i>n/a</i>	10	3	30
Teaching Hospital	<i>n/a</i>	20	4	80
<b>TOTAL</b>				<b>302</b>

\*MoH has not previously indicated norms or targets for specialized nurses

The Master of Nursing: Medical Surgical program aims to contribute to achieving 71% of this public sector workforce target (214 health workers out of a target of 302); the expected contribution of the program toward achieving the national target is indicated in Figure 10.4.3.1.

Figure 10.4.3.1: Public Sector Health Workforce Targets vs. Forecast of Workforce with Intervention | Master of Nursing: Medical Surgical



Note: forecasted workforce figures are estimated at close of fiscal year

#### 10.4.3.2 Training Targets

In order to achieve the programmatic target of 214 medical surgical nurses in the public sector and achieve sustainability of the Master of Nursing: Medical Surgical training program, the following enrollment and graduation scenario is planned (Table 10.4.3.B). The program aims to enroll 40 new trainees every year, starting in academic year

2025-26. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 78 students and yield roughly 36 graduates per year.

Table 10.4.3.B: Enrollment & Graduation Targets to Achieve Objectives | Master of Nursing: Medical Surgical

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	13	20	39	49	59	69	78	78	78	78	
Year 1 Intake	0	20	20	30	30	40	40	40	40	40	<b>Total</b>
Expected Graduates*	0	13	0	18	18	27	27	36	36	36	<b>211</b>

\*figures are rounded to match total as needed

### 10.4.3.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.4.3.C.

Table 10.4.3.C: Faculty Gaps and Requirements Master of Nursing: Medical Surgical

Faculty	Required	Currently Available	Gap
Medical Surgical Nurses Masters	11	2	9
Medical Surgical Nurses PhD	6	0	6
<b>TOTAL</b>	<b>17</b>	<b>2</b>	<b>15</b>

Given there are no available specialists in Rwanda with the requisite expertise to fill these positions, it is proposed that 0 of the total gap of 15 faculty (Table 10.4.3.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.4.3.D: Immediate Faculty Hiring Targets | Master of Nursing: Medical Surgical

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Medical Surgical Nurses Masters	11	2	0	9
Medical Surgical Nurses PhD	6	0	0	6
<b>TOTAL</b>	<b>17</b>	<b>2</b>	<b>0</b>	<b>15</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications.

To fulfill faculty requirements, Table 10.4.3.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.4.3.E: Total Study Abroad Needs | Master of Nursing: Medical Surgical

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Medical Surgical Nurses Masters	0	0	0	0	0	0	0	0	0	0	0
Medical Surgical Nurses PhD	4	0	3	3	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>						

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.4.3.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.4.3.F: Total Visiting Faculty Needs (FTE) | Master of Nursing: Medical Surgical

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	30	39	49	58	58	58	58	58	58	58
Visiting Medical Surgical Nurses Masters Faculty	0	0	0	0	0	0	0	0	0	0
Visiting Medical Surgical Nurses PhD Faculty	1	2	3	4	5	3	0	0	0	0
<b>TOTAL</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

#### 10.4.4 Master of Nursing: Perioperative

##### 10.4.4.1 Objective & Workforce Targets

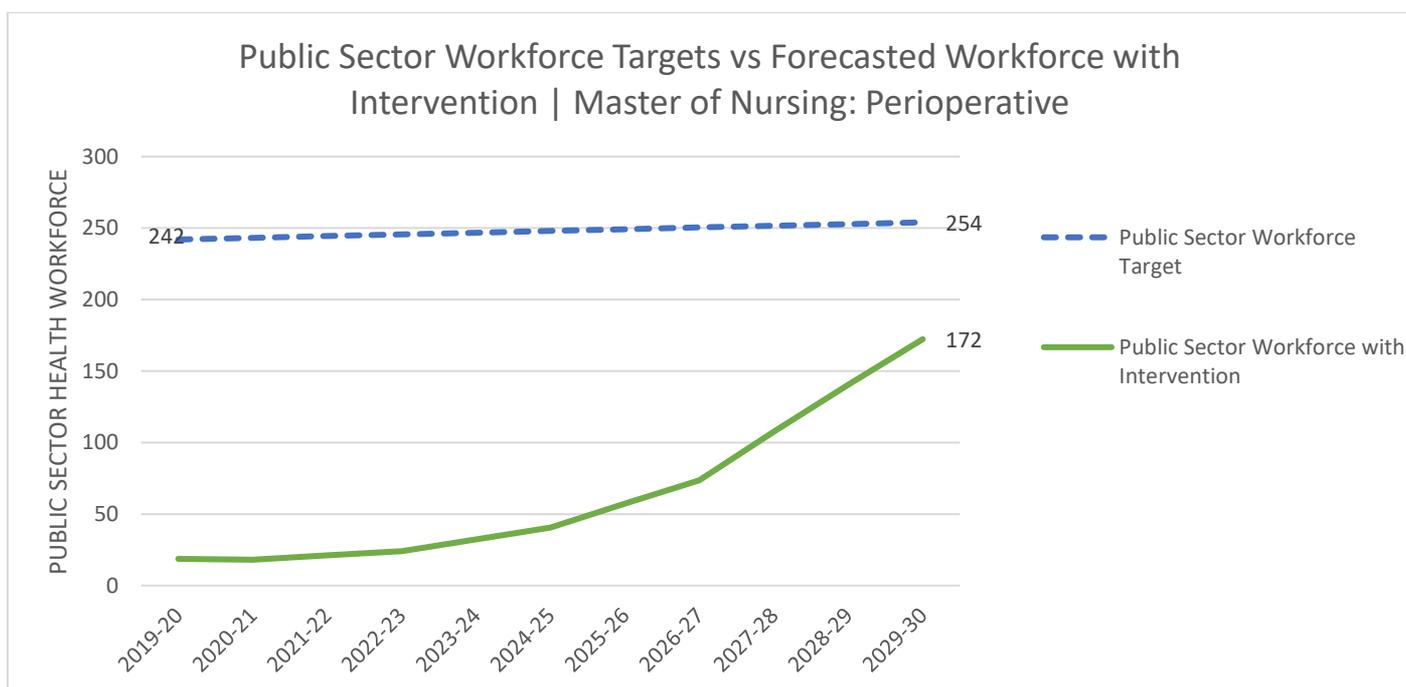
As of January 2020, Rwanda had 13 perioperative nurses working in the public sector health workforce. Over the next 10 years, MOH aims to have 254 perioperative nurses in the public sector by deploying them according to the facility staffing norms described below in Table 10.4.4.A

Table 10.4.4.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Master of Nursing: Perioperative

Facility Level	MOH Norm – Current	MOH Norm – Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	3	40	120
Provincial Hospital	<i>n/a</i>	6	4	24
Referral Hospital	<i>n/a</i>	10	3	30
Teaching Hospital	<i>n/a</i>	20	4	80
<b>TOTAL</b>				<b>254</b>

The Master of Nursing: Perioperative program aims to contribute to achieving 68% of this public sector workforce target (172 health workers out of a target of 254); the expected contribution of the program toward achieving the national target is indicated in Figure 10.4.4.1.

Figure 10.4.4.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Master of Nursing: Perioperative



Note: forecasted workforce figures are estimated at close of fiscal year

#### 10.4.4.2 Training Targets

In order to achieve the programmatic target of 172 perioperative nurses in the public sector and achieve sustainability of the Master of Nursing: Perioperative training program, the following enrollment and graduation scenario is planned (Table 10.4.4.B). The program aims to enroll 40 new trainees every year, starting in academic year 2026-27. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 78 students and yield roughly 36 graduates per year.

Table 10.4.4.B: Enrollment & Graduation Targets to Achieve Objectives | Master of Nursing: Perioperative

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	8	14	20	30	39	59	78	78	78	78	
Year 1 Intake	4	10	10	20	20	40	40	40	40	40	<b>Total</b>
Expected Graduates*	0	4	4	9	9	18	18	36	36	36	<b>170</b>

\*figures are rounded to match total as needed

### 10.4.4.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.4.4.C.

Table 10.4.4.C: Faculty Gaps and Requirements | Master of Nursing: Perioperative

Faculty	Required	Currently Available	Gap
Perioperative Nurses Masters	12	2	10
Perioperative Nurses PhD	5	0	5
<b>TOTAL</b>	<b>17</b>	<b>2</b>	<b>15</b>

It is proposed that 5 of the total gap of 15 faculty (Table 10.4.4.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.4.4.D: Immediate Faculty Hiring Targets | Master of Nursing: Perioperative

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Perioperative Nurses Masters	12	2	5	5
Perioperative Nurses PhD	5	0	0	5
<b>TOTAL</b>	<b>17</b>	<b>2</b>	<b>5</b>	<b>10</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications.

To fulfill faculty requirements, Table 10.4.4.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.4.4.E: Total Study Abroad Needs | Master of Nursing: Perioperative

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Perioperative Nurses Masters	0	0	0	0	0	0	0	0	0	0	0
Perioperative Nurses PhD	4	0	4	1	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>4</b>	<b>1</b>	<b>0</b>						

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.4.4.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.4.4.F: Total Visiting Faculty Needs (FTE) | Master of Nursing: Perioperative

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	8	14	20	30	39	59	78	78	78	78
Perioperative Nurses Masters	0	0	0	0	0	0	0	0	0	0
Perioperative Nurses PhD	1	1	2	2	3	0	0	0	0	0
Anesthesiologists Faculty	0	0	0	0	0	0	0	0	0	0
General Surgeons Faculty	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.4.5 Physician: Anesthesiology

### 10.4.5.1 Objective & Workforce Targets

As of January 2020, Rwanda had 27 Anesthesiologists working in the public sector health workforce—an increase from 8 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 162 anesthesiologists in the public sector by deploying them according to the facility staffing norms described below in Table 10.4.5.A.

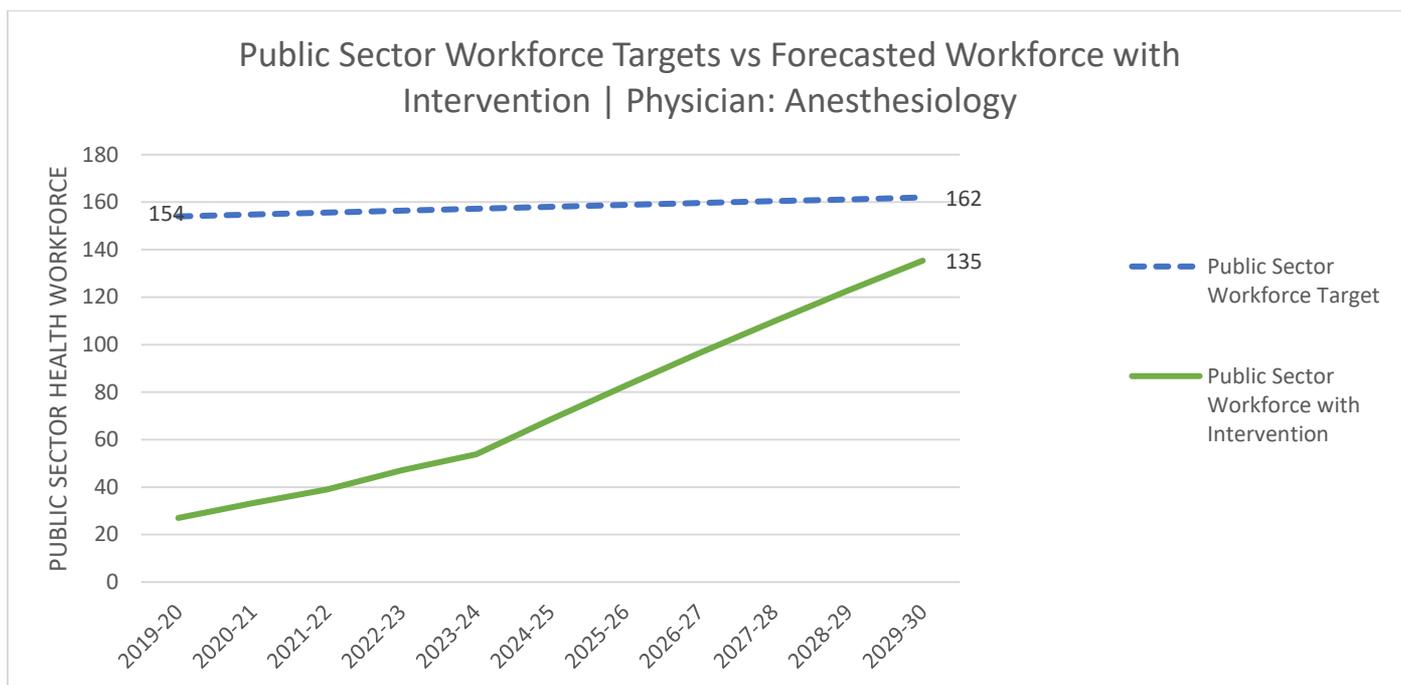
Table 10.4.5.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Anesthesiology

Facility Level	MOH Norm - Current*	MOH Norm – Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	6	2	40	80
Provincial Hospital	10	4	4	16
Referral Hospital	11	6	3	18
Teaching Hospital	<i>n/a</i>	12	4	48
<b>TOTAL</b>				<b>162</b>

\*Unspecified distribution between General Surgery, Internal Medicine, Ob-Gyn, Pediatrics, Anesthesiology

The Physician: Anesthesiology program aims to contribute to achieving 83% of this public sector workforce target (135 health workers out of a target of 162); the expected contribution of the program toward achieving the national target is indicated in Figure 10.4.5.1.

Figure 10.4.5.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Anesthesiology



Note: forecasted workforce figures are estimated at close of fiscal year

#### 10.4.5.2 Training Targets

In order to achieve the programmatic target of 135 anesthesiologists in the public sector and achieve sustainability of the Anesthesiology training program, the following enrollment and graduation scenario is planned (Table 10.4.5.B). The program aims to enroll 24 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 77 students and yield roughly 18 graduates per year.

Table 10.4.5.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Anesthesiology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	48	59	68	77	77	77	77	77	77	77	
Year 1 Intake	20	20	20	20	20	20	20	20	20	20	<b>Total</b>
Expected Graduates*	8	8	10	9	18	18	18	18	18	18	<b>143</b>

\*figures are rounded to match total as needed

#### 10.4.5.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.4.5.C.

Table 10.4.5.C: Faculty Gaps and Requirements | Physician: Anesthesiology

Faculty	Required	Currently Available	Gap
General Anesthesiologist	15	2	13
ICU subspecialist	4	1	3
Pediatrics anesthesia subspecialist	2	0	2
Obstetric anesthesia subspecialist	2	0	2
Local/Regional subspecialist	2	0	2
Anesthesiologist Scholar	0	0	0
<b>TOTAL</b>	<b>25</b>	<b>3</b>	<b>22</b>

It is proposed that 25 of the total gap of 22 faculty (Table 10.4.5.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.4.5.D: Immediate Faculty Hiring Targets | Physician: Anesthesiology

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General Anesthesiologist	15	2	20	0
ICU subspecialist	4	1	1	2
Pediatrics anesthesia subspecialist	2	0	2	0
Obstetric anesthesia subspecialist	2	0	1	1
Local/Regional subspecialist	2	0	0	2
Anesthesiologist Scholar	0	0	1	0
<b>TOTAL</b>	<b>25</b>	<b>3</b>	<b>25</b>	<b>5</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.4.5.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.4.5.E: Total Study Abroad Needs | Physician: Anesthesiology

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General Anesthesiologist	0	0	0	0	0	0	0	0	0	0	0
ICU subspecialist	2	0	2	0	0	0	0	0	0	0	0
Pediatrics anesthesia subspecialist	2	0	0	0	0	0	0	0	0	0	0
Obstetric anesthesia subspecialist	2	0	1	0	0	0	0	0	0	0	0
Local/Regional subspecialist	2	0	2	0	0	0	0	0	0	0	0
Anesthesiologist Scholar	2	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>5</b>	<b>0</b>							

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.4.5.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.4.5.F: Total Visiting Faculty Needs (FTE) | Physician: Anesthesiology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	48	59	68	77	77	77	77	77	77	77
General Anesthesiologist	0	0	0	0	0	0	0	0	0	0
ICU subspecialist	0	0.17	0.17	0	0	0	0	0	0	0
Pediatrics anesthesia subspecialist	0	0	0	0	0	0	0	0	0	0
Obstetric anesthesia subspecialist	0	0	1	0	0	0	0	0	0	0
Local/Regional subspecialist	0.04	0.04	0.08	0	0	0	0	0	0	0
Anesthesiologist Scholar	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>0.04</b>	<b>0.21</b>	<b>1.25</b>	<b>0</b>						

## 10.4.6 Physician: Otorhinolaryngology (ENT)

### 10.4.6.1 Objective & Workforce Targets

As of January 2020, Rwanda had 16 ENT physicians working in the public sector health workforce—an increase from 5 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 124 ENT physicians in the public sector by deploying them according to the facility staffing norms described below in Table 10.4.6.A.

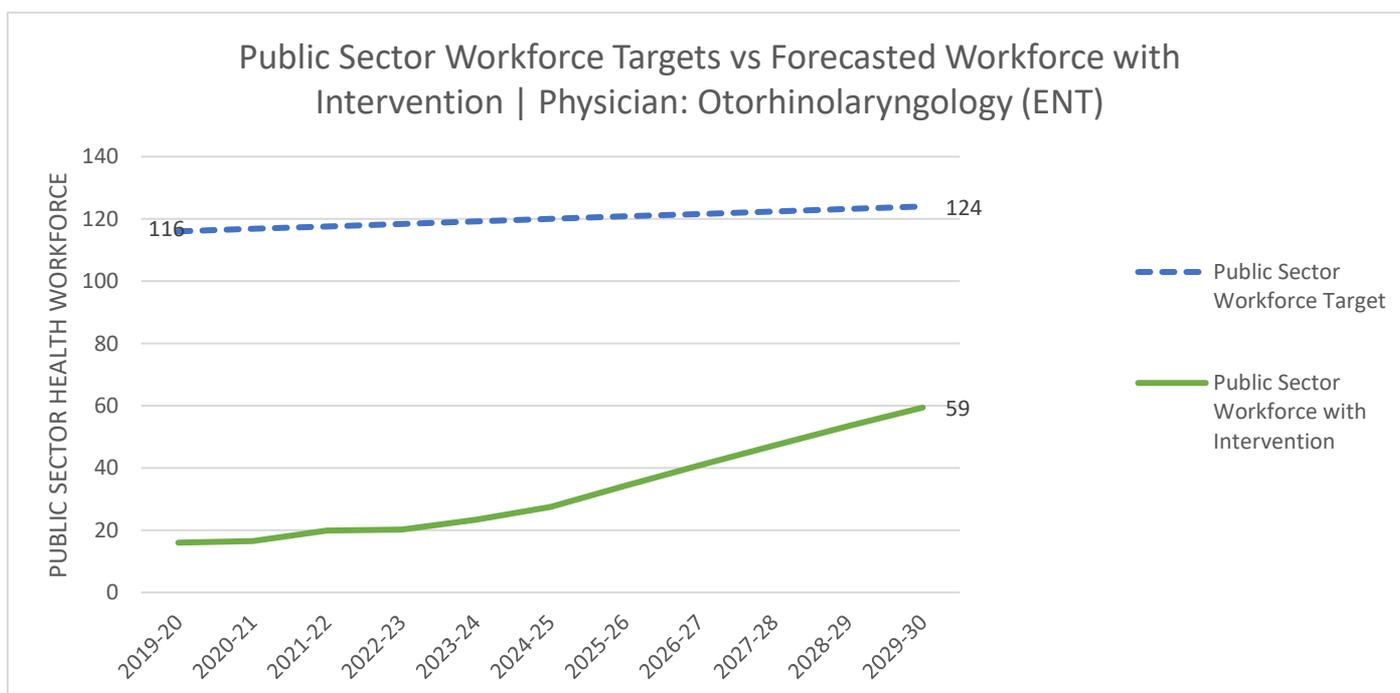
Table 10.4.6.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Otorhinolaryngology (ENT)

Facility Level	MOH Norm - Current*	MOH Norm – Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	6*	2	40	80
Provincial Hospital	10*	2	4	8
Referral Hospital	11*	4	3	12
Teaching Hospital	<i>n/a</i>	6	4	24
<b>TOTAL</b>				<b>124</b>

\*Unspecified distribution between General Surgery, Internal Medicine, Ob-Gyn, Pediatrics, Anesthesiology

The Physician: Otorhinolaryngology (ENT) program aims to contribute to achieving 48% of this public sector workforce target (59 health workers out of a target of 124); the expected contribution of the program toward achieving the national target is indicated in Figure 10.4.6.1.

Figure 10.4.6.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Otorhinolaryngology (ENT)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.4.6.2 Training Targets

In order to achieve the programmatic target of 59 ENT physicians in the public sector and achieve sustainability of the Otorhinolaryngology (ENT) training program, the following enrollment and graduation scenario is planned (Table 10.4.6.B). The program aims to enroll 8 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 31 students and yield roughly 8 graduates per year.

Table 10.4.6.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Otorhinolaryngology (ENT)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	14	18	25	29	31	31	31	31	31	31	
Year 1 Intake	4	5	8	8	8	8	8	8	8	8	<b>Total</b>
Expected Graduates*	1	4	1	4	5	7	7	7	8	8	<b>52</b>

\*figures are rounded to match total as needed

### 10.4.6.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.4.6.C.

Table 10.4.6.C: Faculty Gaps and Requirements | Physician: Otorhinolaryngology (ENT)

Faculty	Required	Currently Available	Gap
Generalist ENT	4	1	3
Neuro-Otologist	2	0	2
Head and Neck Surgeon	2	0	2
Rhinologist	2	0	2
Pediatric ENT	2	0	2
<b>TOTAL</b>	<b>12</b>	<b>1</b>	<b>11</b>

It is proposed that 3 of the total gap of 11 faculty (Table 10.4.6.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.4.6.D: Immediate Faculty Hiring Targets | Physician: Otorhinolaryngology (ENT)

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Generalist ENT	4	1	3	0
Neuro-Otologist	2	0	0	2
Head and Neck Surgeon	2	0	0	2
Rhinologist	2	0	0	2
Pediatric ENT	2	0	0	2
<b>TOTAL</b>	<b>12</b>	<b>1</b>	<b>3</b>	<b>8</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize. To fulfill faculty requirements, Table 10.4.6.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.4.6.E: Total Study Abroad Needs | Physician: Otorhinolaryngology (ENT)

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Generalist/ENT	0	0	0	0	0	0	0	0	0	0	0
Neuro-Otologist	2	0	1	0	1	0	0	0	0	0	0
Head and Neck Surgeon	1	0	1	0	1	0	0	0	0	0	0
Rhinologist	2	0	1	0	1	0	0	0	0	0	0
Pediatric ENT	2	0	1	0	1	0	0	0	0	0	0
<b>TOTAL</b>	<b>n/a</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.4.6.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.4.6.F: Total Visiting Faculty Needs (FTE) | Physician: Otorhinolaryngology (ENT)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	18	25	29	31	31	31	31	31	31	31
Generalist/ENT	0	0	0	0	0	0	0	0	0	0
Neuro-Otologist	0.17	0.17	0.33	0.17	0.17	0	0	0	0	0
Head and Neck Surgeon	0.17	0.17	0.17	0.17	0	0	0	0	0	0
Rhinologist	0.17	0.17	0.33	0.17	0.17	0	0	0	0	0
Pediatric ENT	0.17	0.17	0.33	0.17	0.17	0	0	0	0	0
<b>TOTAL</b>	<b>0.68</b>	<b>0.68</b>	<b>1.16</b>	<b>0.68</b>	<b>0.51</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.4.7 Physician: Surgery-General

### 10.4.7.1 Objective & Workforce Targets

As of January 2020, Rwanda had 42 general surgeons working in the public sector health workforce—an increase from 6 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 140 general surgeons in the public sector by deploying them according to the facility staffing norms described below in Table 10.4.7.A.

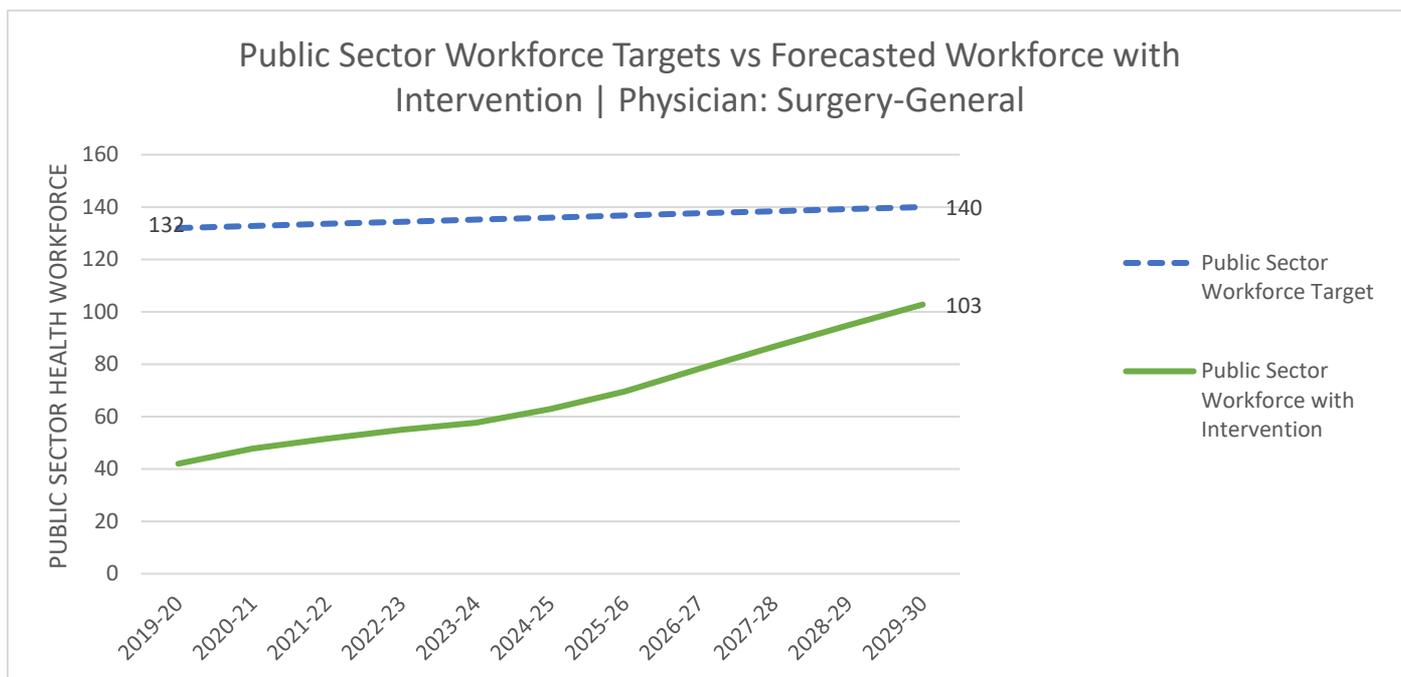
Table 10.4.7.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Surgery-General

Facility Level	MOH Norm - Current*	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	6*	2	40	80
Provincial Hospital	10*	4	4	16
Referral Hospital	11*	4	3	12
Teaching Hospital	<i>n/a</i>	8	4	32
<b>TOTAL</b>				<b>140</b>

\*Unspecified distribution between General Surgery, Internal Medicine, Ob-Gyn, Pediatrics, Anesthesiology

The Physician: Surgery General program aims to contribute to achieving 73% of this public sector workforce target (103 health workers out of a target of 140); the expected contribution of the program toward achieving the national target is indicated in Figure.10.4.7.i.

Figure 10.4.7.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Surgery-General



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.4.7.2 Training Targets

In order to achieve the programmatic target of 103 general surgeons in the public sector and achieve sustainability of the General Surgery training program, the following enrollment and graduation scenario is planned (Table 10.4.7.B). The program aims to enroll 16 new trainees every year, starting in academic year 2020-21. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 72 students and yield roughly 12 graduates per year.

Table 10.4.7.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Surgery-General

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	28	33	42	51	56	69	72	72	72	72	
Year 1 Intake	10	12	16	16	16	16	16	16	16	16	<b>Total</b>
Expected Graduates*	8	6	6	5	8	10	12	12	12	13	<b>92</b>

\*figures are rounded to match total as needed

### 10.4.7.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.4.7.C.

Table 10.4.7.C: Faculty Gaps and Requirements | Physician: Surgery-General

Faculty	Required	Currently Available	Gap
General Surgery	18	4	14
Vascular Surgery	2	0	2
Thoracic Surgery	2	0	2
Oncology Surgery	2	0	2
Trauma Surgery	2	0	2
Pediatric Surgery	2	1	1
Orthopedic Surgery	2	0	2
Colorectal	2	0	2
Hepatobiliary	2	0	2
Endocrine	2	0	2
<b>TOTAL</b>	<b>36</b>	<b>5</b>	<b>31</b>

It is proposed that 28 of the total gap of 36 faculty (Table 10.4.7.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.4.7.D: Immediate Faculty Hiring Targets | Physician: Surgery-General

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General Surgery	18	4	24	0
Vascular Surgery	2	0	0	2
Thoracic Surgery	2	0	1	1
Oncology Surgery	2	0	0	2
Trauma Surgery	2	0	0	2
Pediatric Surgery	2	1	1	0
Orthopedic Surgery	2	0	2	0
Colorectal	2	0	0	2
Hepatobiliary	2	0	0	2
Endocrine	2	0	0	2
<b>TOTAL</b>	<b>36</b>	<b>5</b>	<b>28</b>	<b>13</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.4.7.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.4.7.E. Total Study Abroad Needs | Physician: Surgery-General

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General Surgery	0	0	0	0	0	0	0	0	0	0	0
Vascular Surgery	3	0	1	1	0	0	0	0	0	0	0
Thoracic Surgery	3	0	1	0	0	0	0	0	0	0	0
Oncology Surgery	3	0	1	1	0	0	0	0	0	0	0
Trauma Surgery	3	0	1	1	0	0	0	0	0	0	0
Pediatric Surgery	3	0	1	0	0	0	0	0	0	0	0
Orthopedic Surgery	3	0	0	0	0	0	0	0	0	0	0
Colorectal	0	0	0	1	1	0	1	0	0	0	0
Hepatobiliary	0	0	0	1	1	0	1	0	0	0	0
Endocrine	0	0	0	1	1	0	1	0	0	0	0
<b>TOTAL</b>	<b>n/a</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.4.7.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.4.7.F: Total Visiting Faculty Needs (FTE) | Physician: Surgery-General

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	28	33	42	51	56	69	72	72	72	72
General Surgery	0	0	0	0	0	0	0	0	0	0
Vascular Surgery	0.5	0.5	0.5	1	0.5	0	0	0	0	0
Thoracic Surgery	0	0	0	0.25	0	0	0	0	0	0
Oncology Surgery	0.3	0.3	0.3	0.5	0.3	0	0	0	0	0
Trauma Surgery	0.3	0.3	0.3	0.5	0.3	0	0	0	0	0
Pediatric Surgery	0	0	0	0	0	0	0	0	0	0
Orthopedic Surgery	0	0	0	0	0	0	0	0	0	0
Colorectal	0.25	0.25	0.25	0.5	0.5	0.25	0	0	0	0
Hepatobiliary	0.25	0.25	0.25	0.5	0.5	0.25	0.25	0.25	0	0
Endocrine	0.25	0.25	0.25	0.5	0.5	0.25	0.25	0	0	0
<b>TOTAL</b>	<b>1.85</b>	<b>1.85</b>	<b>1.85</b>	<b>3.75</b>	<b>2.6</b>	<b>0.75</b>	<b>0.5</b>	<b>0.25</b>	<b>0</b>	<b>0</b>

## 10.4.8 Physician: Neuro – Surgery

### 10.4.8.1 Objective & Workforce Targets

As of January 2020, Rwanda had 6 working in the public sector health workforce. Over the next 10 years, MOH aims to have 30 neurologists in the public sector by deploying them according to the facility staffing norms described below in Table 10.4.8.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms |

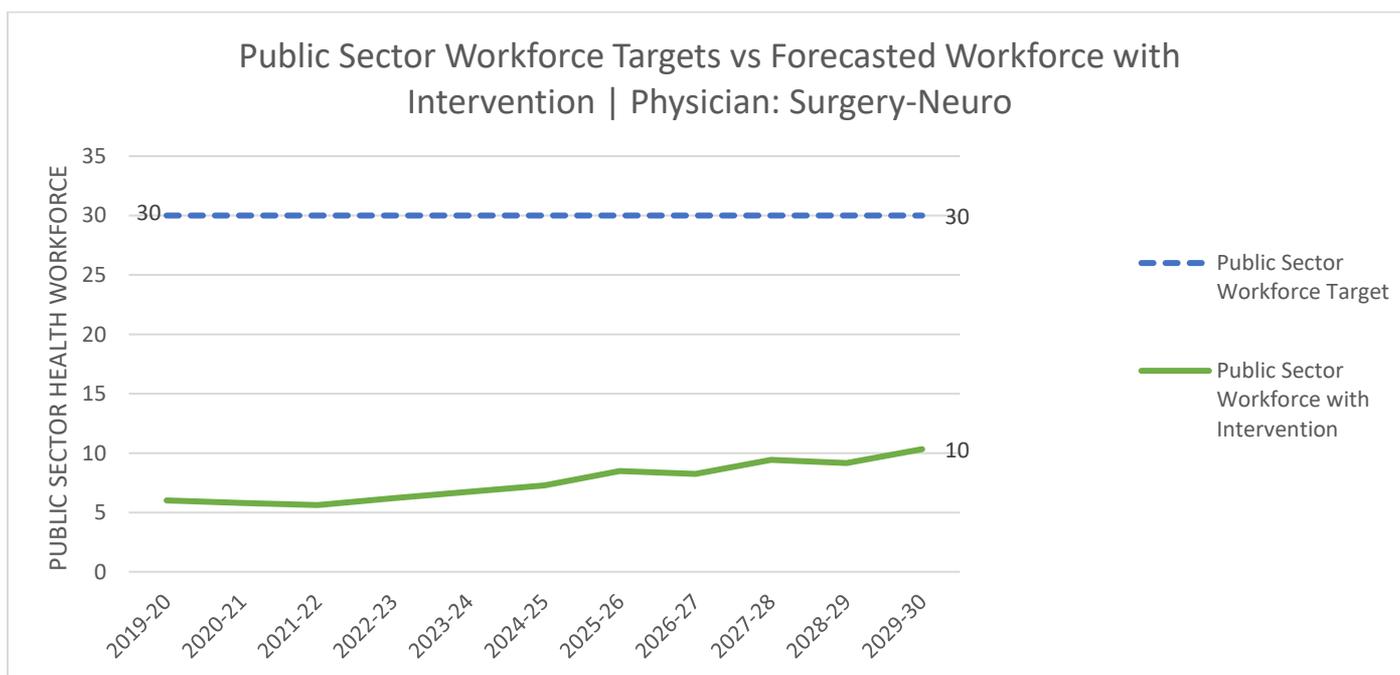
Table 10.4.8.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Neurosurgery

Facility Level	MOH Norm - Current*	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	6	0	40	0
Provincial Hospital	10	0	4	0
Referral Hospital	11	2	3	6
Teaching Hospital	n/a	6	4	24
<b>TOTAL</b>				<b>30</b>

\*Unspecified distribution between General Surgery, Internal Medicine, Ob-Gyn, Pediatrics, Anesthesiology

The Neuro-surgery program aims to contribute to achieving 33% of this public sector workforce target (10 health workers out of a target of 30); the expected contribution of the program toward achieving the national target is indicated in Figure 10.4.8.1: Public Sector Health Workforce Targets vs. Forecasted Production | Physicians:

Figure 10.4.8.1: Public Sector Health Workforce Targets vs. Forecasted Production | Physicians: Neurosurgery



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.4.8.2 Training Targets

In order to achieve the programmatic target of 10 in the public sector and achieve sustainability of the neuro-surgery training program, the following enrolment and graduation scenario is planned (Table 10.4.8.B). The program aims to

enroll 2 trainees every year, starting in academic year 2025-26. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 10 students and yield roughly 2 graduates per year.

Table 10.4.8.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Neurosurgery

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	5	7	6	7	6	6	8	8	10	10	
Year 1 Intake	0	2	0	2	0	2	2	2	2	2	<b>Total</b>
Expected Graduates*	0	0	1	1	1	2	0	2	0	1	<b>8</b>

\*figures are rounded to match total as needed

### 10.4.8.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.1.9.C.

Table 10.4.8.C: Faculty Gaps and Requirements | Physician: Neurosurgery

Faculty	Required	Currently Available	Gap
Neurosurgery	4	0	4
Ped Neuro	2	0	2
Neuro-oncology	2	0	2
Spine	2	2	0
<b>TOTAL</b>	<b>10</b>	<b>2</b>	<b>8</b>

It is proposed that 4 of the total gap of 13 faculty (Table 10.4.8.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.4.8.D: Immediate Faculty Hiring Targets | Physician: Neurosurgery

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Neurosurgery	4	0	4	0
Pediatric neurosurgery	2	0	0	2
Neuro-oncology surgery	2	0	0	2
Spinal surgery	2	2	0	0
<b>TOTAL</b>	<b>10</b>	<b>2</b>	<b>4</b>	<b>4</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain necessary specializations. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.4.8.E: Total Study Abroad Needs | Physician: Neurosurgery

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Neurosurgery	0	0	0	0	0	0	0	0	0	0	0
Ped neuro	2	0	0	1	0	0	0	0	0	0	0
Neuro-oncology	2	0	0	0	1	0	0	1	0	0	0
Spine	2	0	0	0	0	0	0	1	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.4.8.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.4.8.F : Total Visiting Faculty Needs (FTE) | Physician: Neurosurgery

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	5	7	6	7	6	6	8	8	10	10
Neurosurgery Faculty	0	0	0	0	0	0	0	0	0	0
Ped Neuro Faculty	0.5	0.5	0.5	0.5	0	0	0	0	0	0
Neuro-oncology Faculty	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0
Spine Faculty	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0.5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.4.9 Physician: Surgery-Orthopedic

### 10.4.9.1 Objective & Workforce Targets

As of January 2020, Rwanda had 19 orthopedic surgeons working in the public sector health workforce. Over the next 10 years, MOH aims to have 60 orthopedic surgeons in the public sector by deploying them according to the facility staffing norms described below in Table 10.4.9.A.

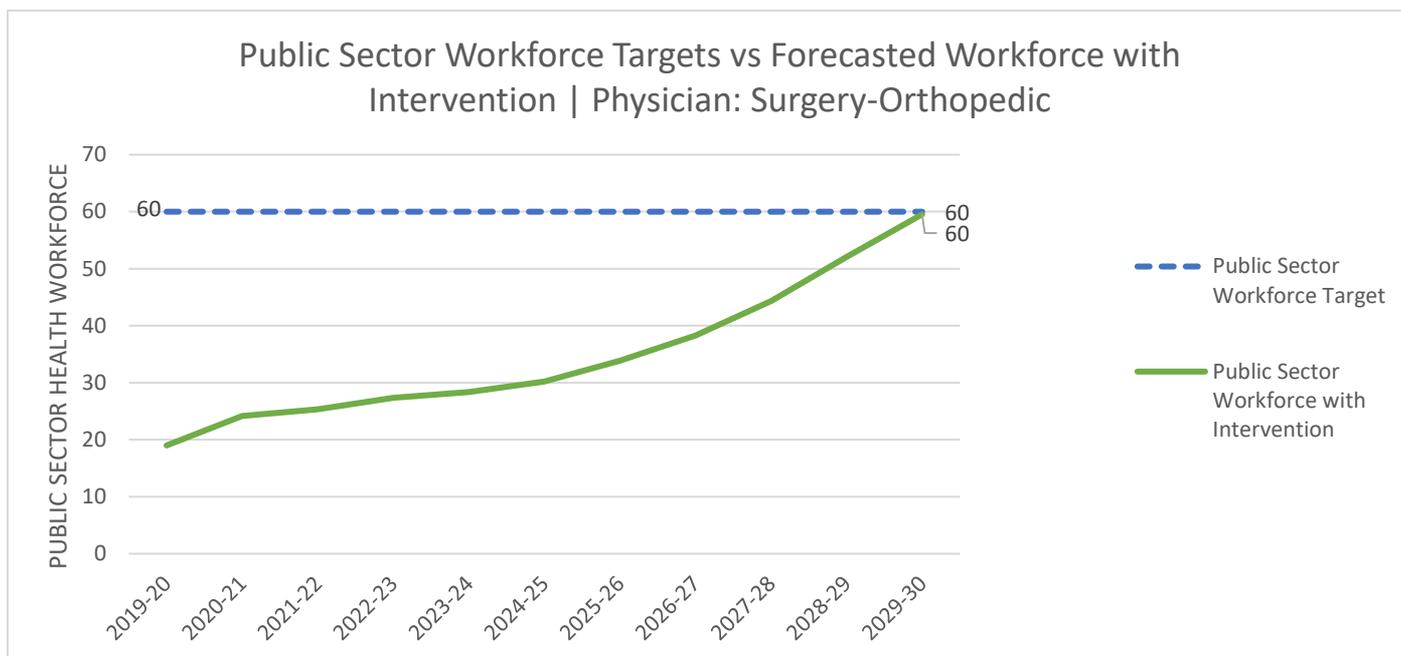
Table 10.4.9.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Surgery-Orthopedic

Facility Level	MOH Norm - Current*	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	6*	0	40	0
Provincial Hospital	10*	2	4	8
Referral Hospital	11*	4	3	12
Teaching Hospital	n/a	10	4	40
<b>TOTAL</b>				<b>60</b>

\*Unspecified distribution between General Surgery, Internal Medicine, Ob-Gyn, Pediatrics, Anesthesiology

The Physician: Surgery-Orthopedic program aims to contribute to achieving 100% of this public sector workforce target (60 health workers out of a target of 60); the expected contribution of the program toward achieving the national target is indicated in Figure 10.4.9.i.

Figure 10.4.9.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Surgery-Orthopedic



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.4.9.2 Training Targets

In order to achieve the programmatic target of 60 orthopedic surgeons in the public sector and achieve sustainability of the Orthopedic Surgery training program, the following enrollment and graduation scenario is planned (Table 10.4.9.B). The program aims to enroll 10 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 48 students and yield roughly 9 graduates per year.

Table 10.4.9.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Surgery-Orthopedic

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	15	19	23	31	38	42	46	48	48	48	
Year 1 Intake	5	6	8	10	10	10	10	10	10	10	<b>Total</b>
Expected Graduates*	5	2	3	2	3	5	5	7	9	9	<b>50</b>

\*figures are rounded to match total as needed

### 10.4.9.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.4.9.C.

Table 10.4.9.C: Faculty Gaps and Requirements | Physician: Surgery-Orthopedic

Faculty	Required	Currently Available	Gap
General Surgery	2	2	0
Orthopedic Surgery	14	0	14
Spine	2	2	0
Pediatric	2	0	2
Oncology	2	0	2
Hand	2	0	2
Foot	2	0	2
Trauma	2	0	2
Arthroplasty	2	0	2
Sports	2	0	2
<b>TOTAL</b>	<b>32</b>	<b>4</b>	<b>28</b>

It is proposed that 16 of the total gap of 28 faculty (Table 10.4.9.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.4.9.D: Immediate Faculty Hiring Targets | Physician: Surgery-Orthopedic

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General Surgery	2	2	0	0
Orthopedic Surgery	14	0	14	0
Spine	2	2	0	0
Pediatric	2	0	0	2
Oncology	2	0	0	2
Hand	2	0	0	2
Foot	2	0	0	2
Trauma	2	0	0	2
Arthroplasty	2	0	0	2
Sports	2	0	1	1
<b>TOTAL</b>	<b>32</b>	<b>4</b>	<b>15</b>	<b>13</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.4.9.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty.

Table 10.4.9.E: Total Study Abroad Needs | Physician: Surgery-Orthopedic

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General Surgery	0	0	0	0	0	0	0	0	0	0	0
Orthopedic Surgery	0	0	0	0	0	0	0	0	0	0	0
Spine	2	0	0	0	0	0	0	0	0	0	0
Pediatric	2	0	1	1	0	0	0	0	0	0	0
Oncology	2	0	1	0	1	0	0	0	0	0	0
Hand	2	0	1	0	1	0	0	0	0	0	0
Foot	2	0	1	0	0	1	0	0	0	0	0
Trauma	0	0	0	0	0	1	0	1	0	0	0
Arthroplasty	0	0	0	0	0	0	1	1	0	0	0
Sports	2	0	0	0	0	1	0	0	1	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.4.9.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.4.9.F: Total Visiting Faculty Needs (FTE) | Physician: Surgery-Orthopedic

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	15	19	23	31	38	42	46	48	48	48
General Surgery	0	0	0	0	0	0	0	0	0	0
Orthopedic Surgery	0	0	0	0	0	0	0	0	0	0
Spine	0	0	0	0	0	0	0	0	0	0
Pediatric	0.5	0.5	0.5	0	0	0	0	0	0	0
Oncology	0.3	0.3	0.3	0	0.3	0	0	0	0	0
Hand	0.3	0.3	0.3	0	0.3	0	0	0	0	0
Foot	0.3	0.3	0.3	0	0.3	0.3	0	0	0	0
Trauma	0.3	0.3	0.3	0.3	0.5	0.5	0.3	0.3	0	0
Arthroplasty	1	1	1	1	2	2	2	1	0	0
Sports	1	1	1	1	2	2	1	1	1	0
<b>TOTAL</b>	<b>3.7</b>	<b>3.7</b>	<b>3.7</b>	<b>2.3</b>	<b>5.4</b>	<b>4.8</b>	<b>3.3</b>	<b>2.3</b>	<b>1</b>	<b>0</b>

## 10.4.10 Physician: Surgery-Urology

### 10.4.10.1 Objective & Workforce Targets

As of January 2020, Rwanda had 10 urological surgeons working in the public sector health workforce. Over the next 10 years, MOH aims to have 38 urological surgeons in the public sector by deploying them according to the facility staffing norms described below in Table 10.4.10.A.

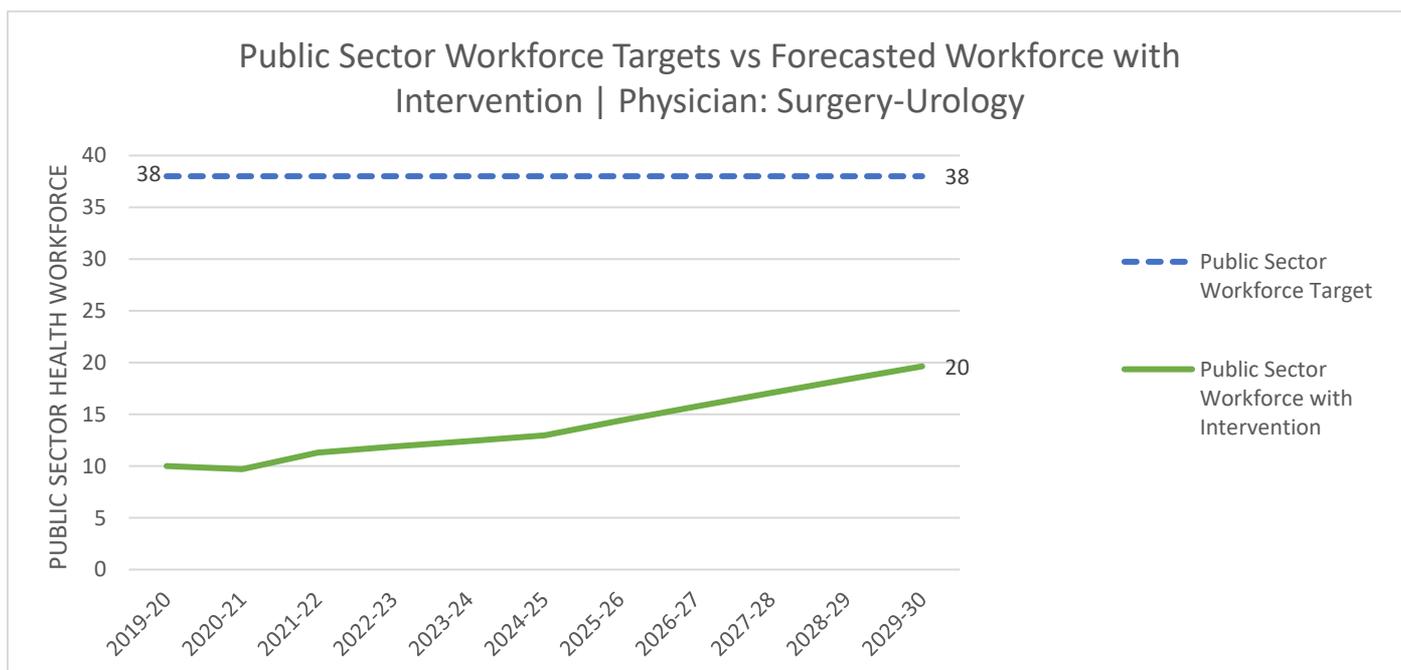
Table 10.4.10.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Surgery-Urology

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	6*	0	40	0
Provincial Hospital	10*	2	4	8
Referral Hospital	11*	2	3	6
Teaching Hospital	<i>n/a</i>	6	4	24
<b>TOTAL</b>				<b>38</b>

\*Aggregate norm for specialties. Unspecified distribution across specialty types.

The Surgery – Urology program aims to contribute to achieving 53% of this public sector workforce target (20 health workers out of a target of 38); the expected contribution of the program toward achieving the national target is indicated in Figure 10.4.10.1.

Figure 10.4.10.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Interventions | Physician: Surgery-Urology



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.4.10.2 Training Targets

In order to achieve the programmatic target of 20 urological surgeons in the public sector and achieve sustainability of the Urological Surgery training program, the following enrollment and graduation scenario is planned (Table 10.4.10.B). The program aims to enroll 4 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 14 students and yield roughly 2 graduates per year.

Table 10.4.10.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Surgery-Urology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	7	7	8	9	10	11	12	13	13	14	
Year 1 Intake	2	2	2	2	2	3	3	3	3	3	<b>Total</b>
Expected Graduates*	0	2	1	1	1	1	2	2	2	2	<b>14</b>

\*figures are rounded to match total as needed

### 10.4.10.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.4.10.C.

Table 10.4.10.C: Faculty Gaps and Requirements | Physician: Surgery-Urology

Faculty	Required	Currently Available	Gap
Urology	2	2	0
Pediatric Urology	2	0	2
Uro-oncology	2	0	2
Endo-Urology	2	0	2
Reconstructive surgery	2	0	2
<b>TOTAL</b>	<b>10</b>	<b>2</b>	<b>8</b>

It is proposed that 4 of the total gap of 8 faculty (Table 10.4.10.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.4.10.D: Immediate Faculty Hiring Targets | Physician: Surgery-Urology

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Urology	2	2	3	0
Pediatric Urology	2	0	0	2
Uro-oncology	2	0	0	2
Endo-Urology	2	0	0	2
Reconstructive surgery	2	0	1	1
<b>TOTAL</b>	<b>10</b>	<b>2</b>	<b>4</b>	<b>7</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.4.10.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.4.10.E: Total Study Abroad Needs | Physician: Surgery-Urology

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Urology	0	0	0	0	0	0	0	0	0	0	0
Pediatric-Urology	2	0	1	0	1	0	0	0	0	0	0
Uro-oncology	2	0	0	1	0	1	0	0	0	0	0
Endo-Urology	2	0	0	0	1	0	1	0	0	0	0
Reconstructive surgery	3	0	0	0	0	1	0	1	0	0	0
<b>Total</b>	<i>n/a</i>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.4.10.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.4.10.F: Total Visiting Faculty Needs (FTE) | Physician: Surgery-Urology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	7	7	8	9	10	11	12	13	13	14
Urology	0	0	0	0	0	0	0	0	0	0
Pediatric-Urology	0.3	0.3	0.3	0	0	0	0	0	0	0
Uro-Oncology	0.3	0.3	0.3	0.3	0	0	0	0	0	0
Endo-Urology	0.3	0.3	0.3	0.3	0.3	0	0	0	0	0
Reconstructive surgery	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>0.9</b>	<b>0.9</b>	<b>0.9</b>	<b>0.6</b>	<b>0.3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.5 MENTAL HEALTH

### 10.5.1 Cluster Objectives & Workforce Targets

The program aims to improve the availability and coverage of 2 services in Rwanda by increasing the availability of qualified and competent providers in this service area.

Table 10.5.1.A National Health Workforce Targets | Mental Health

Program Areas	National Health Workforce Target 2030
Nurse: Mental Health (A1)	664
Physician: Psychiatry	44

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

### 10.5.2 Nurse: Mental Health (A1)

MOH aims to have 664 mental health nurses in the public sector by 2030 by deploying them according to the facility staffing norms described below in Table 10.5.2.A.

Table 10.5.2.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Nurse: Mental Health

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	1	540	540
District Hospital	<i>n/a</i>	2	40	80
Provincial Hospital	<i>n/a</i>	4	4	16
Referral Hospital	<i>n/a</i>	4	3	12
Teaching Hospital	<i>n/a</i>	4	4	16
<b>TOTAL</b>				<b>664</b>

Strategies to scale and strengthen the Mental Health program are not proposed but may be developed in the course of implementation of the National Strategy for Health Professions Development (2030).

### 10.5.3 Physician: Psychiatry

#### 10.5.3.1 Objective & Workforce Targets

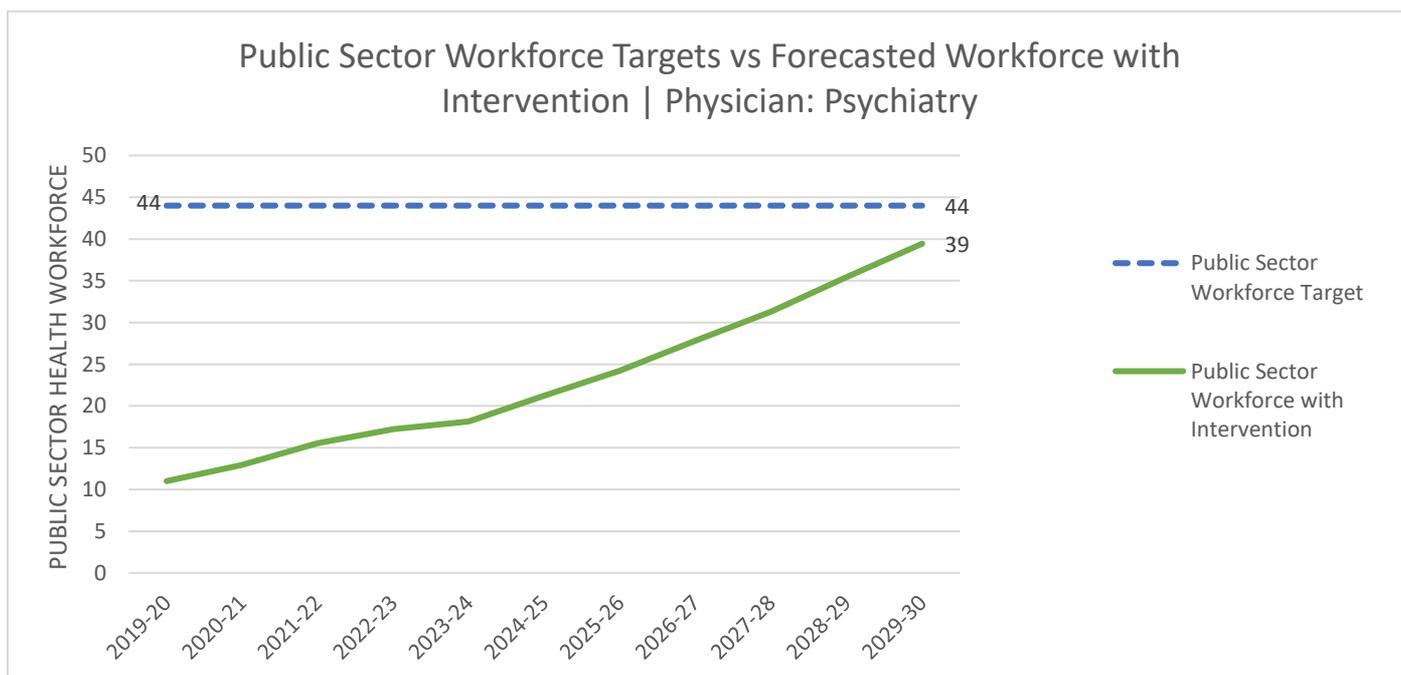
As of January 2020, Rwanda had 11 psychiatrists working in the public sector health workforce—an increase from 3 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 44 psychiatrists in the public sector by deploying them according to the facility staffing norms described below in Table 10.5.3.A.

Table 10.5.3.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Psychiatry

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	6*	0	40	0
Provincial Hospital	10*	2	4	8
Referral Hospital	11*	4	3	12
Teaching Hospital	<i>n/a</i>	6	4	24
<b>TOTAL</b>				<b>44</b>

The Physician: Psychiatry program aims to contribute to achieving 89% of this public sector workforce target (39 health workers out of a target of 44); the expected contribution of the program toward achieving the national target is indicated in Figure 10.5.3.1.

Figure 10.5.3.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Psychiatry



Note: forecasted workforce figures are estimated at close of fiscal year

#### 10.5.3.2 Training Targets

In order to achieve the programmatic target of 39 psychiatrists in the public sector and achieve sustainability of the Psychiatry training program, the following enrollment and graduation scenario is planned (Table 10.5.3.B).The

program aims to enroll 9 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 33 students and yield roughly 6 graduates per year.

Table 10.5.3.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Psychiatry

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	14	15	17	21	23	25	27	29	31	33	
Year 1 Intake	2	5	5	6	6	7	7	8	8	8	<b>Total</b>
Expected Graduates*	3	4	3	2	5	5	5	5	6	6	<b>44</b>

\*figures are rounded to match total as needed

### 10.5.3.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.5.3.C.

Table 10.5.3.C: Faculty Gaps and Requirements | Physician: Psychiatry

Faculty	Required	Currently Available	Gap
General Psychiatrist	7	1	6
Child psychiatrist	2	0	2
Forensic Psychiatry	2	0	2
Addictology	2	0	2
<b>TOTAL</b>	<b>13</b>	<b>1</b>	<b>12</b>

It is proposed that 4 of the total gap of 13 faculty (Table 10.5.3.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.5.3.D: Immediate Faculty Hiring Targets | Physician: Psychiatry

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General Psychiatrist	7	1	3	3
Child Psychiatrist	2	0	1	1
Forensic Psychiatry	2	0	0	2
Addictology	2	0	0	2
<b>TOTAL</b>	<b>13</b>	<b>1</b>	<b>4</b>	<b>8</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.5.3.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.5.3.E: Total Study Abroad Needs | Physician: Psychiatry

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General Psychiatrist	0	0	0	0	0	0	0	0	0	0	0
Child psychiatrist	2	1	0	0	0	0	0	0	0	0	0
Forensic Psychiatry	2	1	0	1	0	0	0	0	0	0	0
Addictology	2	0	1	0	1	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.5.3.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.5.3.F: Total Visiting Faculty Needs (FTE) | Physician: Psychiatry

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	14	15	17	21	23	25	27	29	31	33
General Psychiatrist	0	0	0	0	0	0	0	0	0	0
Child psychiatrist	0	0	0	0	0	0	0	0	0	0
Forensic Psychiatry	0.1	0.1	0	0	0	0	0	0	0	0
Addictology	0.1	0.1	0.1	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>0.2</b>	<b>0.2</b>	<b>0.1</b>	<b>0</b>						

## 10.6 DIAGNOSTICS AND SUPPORT SERVICES

### 10.6.1 Cluster Objectives & Workforce Targets

The program aims to improve the availability and coverage of 3 services in Rwanda by increasing the availability of qualified and competent providers in this service area.

Table 10.6.1.A National Health Workforce Targets | Diagnostics and Support Services

Program Areas	National Health Workforce Target 2030
Biomedical Laboratory Scientist (A0)	826
Physician: Pathology	54
Physician: Radiology	54

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

#### 10.6.1.1 Objective & Workforce Targets

#### 10.6.2 Biomedical Laboratory Scientist (A0)

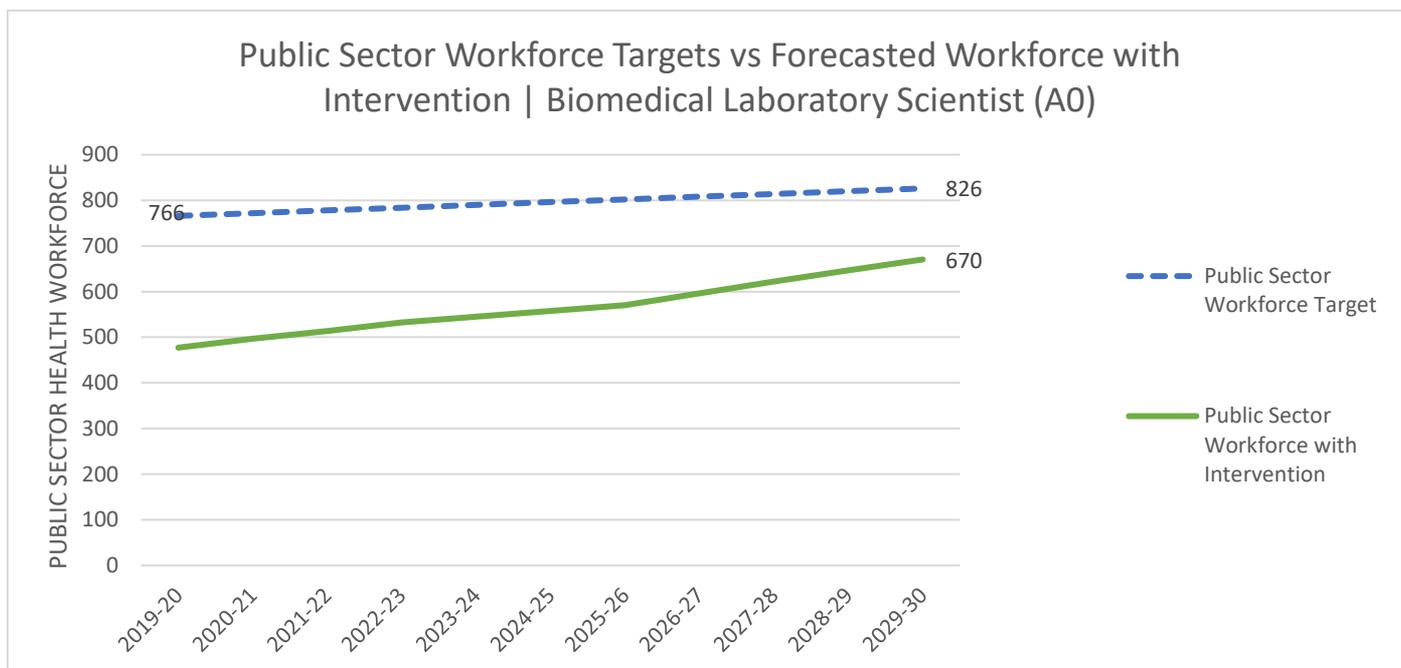
As of January 2020, Rwanda had 435 biomedical laboratory scientists working in the public sector health workforce. Over the next 10 years, MOH aims to have 826 biomedical laboratory scientists in the public sector by deploying them according to the facility staffing norms described below in Table 10.6.2.A.

Table 10.6.2.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Biomedical Laboratory Scientist (A0)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Central Hospital	<i>n/a</i>	0	540	0
District Hospital	7	15	40	600
Provincial Hospital	9	13	4	52
Referral Hospital	9	18	3	54
Teaching Hospital	37	30	4	120
<b>TOTAL</b>				<b>826</b>

The Biomedical Laboratory Scientist program aims to contribute to achieving 81% of this public sector workforce target (670 health workers out of a target of 826); the expected contribution of the program toward achieving the national target is indicated in Figure.10.6.2.i.

Figure 10.6.2.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Biomedical Laboratory Scientist (A0)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.6.2.1 Training Targets

In order to achieve the programmatic target of 670 biomedical laboratory scientists in the public sector and achieve sustainability of the Biomedical Laboratory Science training program, the following enrollment and graduation scenario is planned (Table 10.6.2.B). The program aims to enroll 25 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 231 students and yield roughly 54 graduates per year.

Table 10.6.2.B: Enrollment & Graduation Targets to Achieve Objectives | Biomedical Laboratory Scientist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	165	161	174	194	213	231	231	231	231	231	
Year 1 Intake	40	40	60	60	60	60	60	60	60	60	<b>Total</b>
Expected Graduates*	42	40	43	36	36	37	54	54	54	54	<b>450</b>

\*figures are rounded to match total as needed

### 10.6.2.2 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table.10.6.2.C.

Table 10.6.2.C: Faculty Gaps and Requirements | Biomedical Laboratory Scientist (A0)

Faculty	Required	Currently Available	Gap
Parasitology	2	1	1
Physician Pathologist	2	0	2
Molecular Biology	2	1	1
Hematology	2	1	1
Entomology	2	0	2
Immunology	2	1	1
Virology	2	1	1
Bacteriology	2	1	1
Histotechnology	2	1	1
<b>TOTAL</b>	<b>18</b>	<b>7</b>	<b>11</b>

It is proposed that 2 of the total gap of 11 faculty (Table 10.6.2.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.6.2.D: Immediate Faculty Hiring Targets | Biomedical Laboratory Scientist (A0)

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Parasitology	2	1	1	0
Physician Pathologist	2	0	0	2
Molecular Biology	2	1	0	1
Hematology	2	1	0	1
Entomology	2	0	1	1
Immunology	2	1	0	1
Virology	2	1	0	1
Bacteriology	2	1	0	1
Histotechnology	2	1	0	1
<b>TOTAL</b>	<b>18</b>	<b>7</b>	<b>2</b>	<b>9</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications.

To fulfill faculty requirements, Table 10.6.2.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.6.2.E: Total Study Abroad Needs | Biomedical Laboratory Scientist (A0)

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Parasitology	2	0	2	0	1	0	0	0	0	0	0
Physician Pathologist	0	0	0	0	0	0	0	0	0	0	0
Molecular Biology	2	0	3	0	1	0	0	0	0	0	0
Hematology	2	0	3	0	1	0	0	0	0	0	0
Entomology	2	0	3	0	1	0	0	0	0	0	0
Immunology	2	0	3	0	1	0	0	0	0	0	0
Virology	2	0	3	0	1	0	0	0	0	0	0
Bacteriology	2	0	3	0	1	0	0	0	0	0	0
Histotechnology	2	0	3	0	1	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>23</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.6.2.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.6.2.F: Total Visiting Faculty Needs (FTE) | Biomedical Laboratory Scientist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	165	161	174	194	213	231	231	231	231	231
Parasitology	1	1	1	0	0	0	0	0	0	0
Physician Pathologist	0	0	3	0	0	0	0	0	0	0
Molecular Biology	2	2	2	0	0	0	0	0	0	0
Hematology	2	2	2	0	0	0	0	0	0	0
Entomology	2	2	2	0	0	0	0	0	0	0
Immunology	2	2	2	0	0	0	0	0	0	0
Virology	2	2	2	0	0	0	0	0	0	0
Bacteriology	2	2	2	0	0	0	0	0	0	0
Histotechnology	2	2	2	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>15</b>	<b>15</b>	<b>18</b>	<b>0</b>						

### 10.6.3 Occupational Therapy

#### 10.6.3.1 Objective & Workforce Targets

MOH aims to have 30 occupational therapists in the public sector by 2030 by deploying them according to the facility staffing norms described below in Table 10.6.3.A.

Table 10.6.3.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Occupational Therapy

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Central Hospital	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	0	40	0
Provincial Hospital	<i>n/a</i>	2	4	8
Referral Hospital	<i>n/a</i>	2	3	6
Teaching Hospital	<i>n/a</i>	4	4	16
<b>TOTAL</b>				<b>30</b>

Strategies to scale and strengthen the Occupational Therapy program are not proposed but may be developed in the course of implementation of the National Strategy for Health Professions Development (2030).

### 10.6.4 Physician: Pathology

#### 10.6.4.1 Objective & Workforce Targets

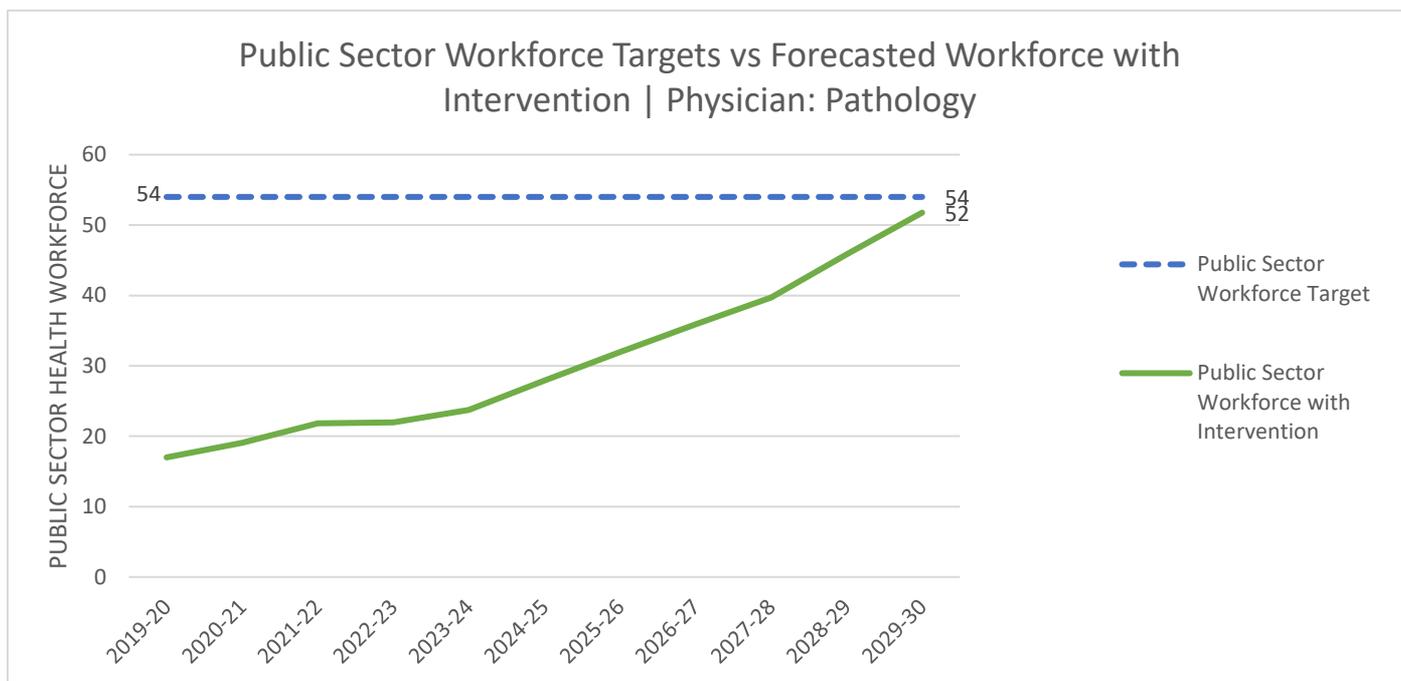
As of January 2020, Rwanda had 17 pathologists working in the public sector health workforce—an increase from 0 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 54 pathologists in the public sector by deploying them according to the facility staffing norms described below in Table 10.6.4.A.

Table 10.6.4.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Pathology

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	0	40	0
Provincial Hospital	<i>n/a</i>	2	4	8
Referral Hospital	<i>n/a</i>	2	3	6
Teaching Hospital	<i>n/a</i>	10	4	40
<b>TOTAL</b>				<b>54</b>

The Physician: Pathology program aims to contribute to achieving 96% of this public sector workforce target (52 health workers out of a target of 54); the expected contribution of the program toward achieving the national target is indicated in Figure 10.6.4.1.

Figure 10.6.4.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Pathology



Note: forecasted workforce figures are estimated at close of fiscal year

#### 10.6.4.2 Training Targets

In order to achieve the programmatic target of 52 pathologists in the public sector and achieve sustainability of the Pathology training program, the following enrollment and graduation scenario is planned (Table 10.6.4.B). The program aims to enroll 9 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 35 students and yield roughly 8 graduates per year.

Table 10.6.4.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Pathology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	14	16	20	23	26	29	32	35	35	35	
Year 1 Intake	3	6	6	6	9	9	9	9	9	9	<b>Total</b>
Expected Graduates*	3	4	1	3	5	5	5	6	8	8	<b>48</b>

\*figures are rounded to match total as needed

#### 10.6.4.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.6.4.C.

Table 10.6.4.C: Faculty Gaps and Requirements | Physician: Pathology

Faculty	Required	Currently Available	Gap
General Pathologists	5	2	3
Hemotopathology	3	1	2
Forensic Pathology	2	0	2
Dermatology	2	0	2
Soft Tissue and Bone & Joints Pathology	2	0	2
Neuropathology	2	0	2
Pediatric Pathology	2	0	2
Nephropathology	2	0	2
Infectious Pathology	2	0	2
Histotechnologists	2	0	2
Molecular Pathology	2	0	2
Clinical Pathology	8	0	8
<b>TOTAL</b>	<b>34</b>	<b>3</b>	<b>31</b>

It is proposed that 15 of the total gap of 31 faculty (Table 10.6.4.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.6.4.D: Immediate Faculty Hiring Targets | Physician: Pathology

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General Pathologists	5	2	13	0
Hemotopathology	3	1	0	2
Forensic Pathology	2	0	0	2
Dermatology	2	0	1	1
Soft Tissue and Bone & Joints Pathology	2	0	0	2
Neuropathology	2	0	0	2
Pediatric Pathology	2	0	0	2
Nephropathology	2	0	1	1
Infectious Pathology	2	0	0	2
Histotechnologists	2	0	0	2
Molecular Pathology	2	0	0	2
Clinical Pathology	8	0	0	8
<b>TOTAL</b>	<b>34</b>	<b>3</b>	<b>15</b>	<b>26</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.6.4.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.6.4.E: Total Study Abroad Needs | Physician: Pathology

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General Pathologists	0	0	0	0	0	0	0	0	0	0	0
Hematopathology	2	0	1	0	0	0	1	0	0	0	0
Forensic Pathology	2	0	1	0	0	0	1	0	0	0	0
Dermatopathology	2	0	0	0	0	0	1	0	0	0	0
Soft Tissue and Bone & Joints Pathology	2	0	1	0	0	0	1	0	0	0	0
Neuropathology	2	0	0	1	0	0	0	1	0	0	0
Pediatric Pathology	2	0	0	0	1	0	0	1	0	0	0
Nephropathology	2	0	0	0	0	0	0	1	0	0	0
Infectious Pathology	2	0	0	0	1	0	0	1	0	0	0
Histotechnologists	2	0	0	0	0	2	0	0	0	0	0
Molecular Pathology	4	0	0	0	0	2	0	0	0	0	0
Molecular Biology	2	0	2	2	2	2	0	0	0	0	0
Clinical Pathology	4	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.6.4.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.6.4.F: Total Visiting Faculty Needs (FTE) | Physician: Pathology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	14	16	20	23	26	29	32	35	35	35
General Pathologists	0	0	0	0	0	0	0	0	0	0
Hematopathology	0	0	0.2	0	0	0	0.2	0	0	0
Forensic Pathology	0.2	0.2	0.2	0	0	0.2	0.2	0	0	0
Dermatopathology	0	0	0	0	0	0.2	0.2	0	0	0
Soft Tissue and Bone & Joints Pathology	0.2	0.2	0.2	0	0	0.2	0.2	0	0	0
Neuropathology	0.2	0.2	0.2	0.2	0	0.2	0.2	0.2	0	0
Pediatric Pathology	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	0
Nephropathology	0	0	0	0	0	0.2	0.2	0.2	0	0
Infectious Pathology	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	0
Histotechnologists	0.2	0.2	0.2	0.2	0.2	0.3	0	0	0	0
Molecular Pathology	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Molecular Biology	0	0	0	0	0	0	0	0	0	0
Clinical Pathology	3	3	5	5	6	4	3	2	0	0
<b>TOTAL</b>	<b>4.4</b>	<b>4.4</b>	<b>6.6</b>	<b>6</b>	<b>6.8</b>	<b>6</b>	<b>4.9</b>	<b>3.1</b>	<b>0.3</b>	<b>0.3</b>

## 10.6.5 Physician: Radiology

### 10.6.5.1 Objective & Workforce Targets

As of January 2020, Rwanda had 8 radiologists working in the public sector health workforce—an increase from 5 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 54 radiologists in the public sector by deploying them according to the facility staffing norms described below in Table 10.6.5.A.

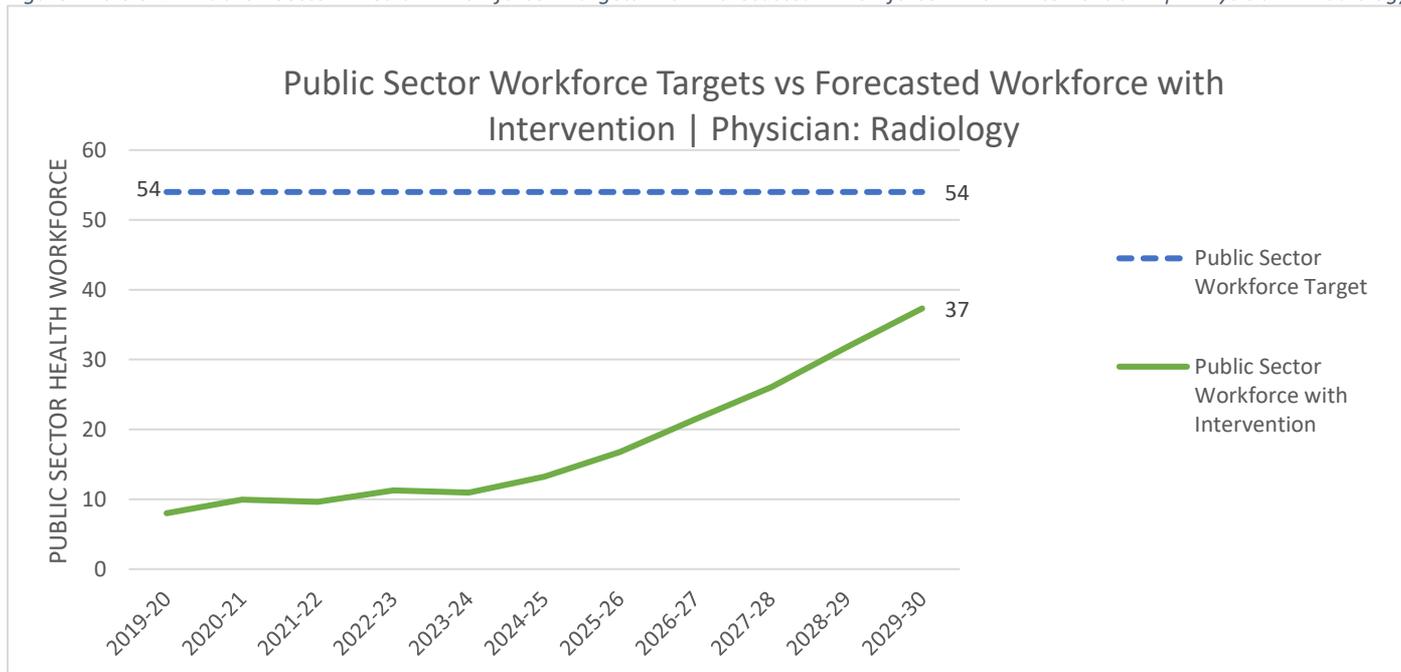
Table 10.6.5.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Radiology

Facility Level	MOH Norm - Current*	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	6*	0	40	0
Provincial Hospital	10*	2	4	8
Referral Hospital	11*	2	3	6
Teaching Hospital	<i>n/a</i>	10	4	40
			<b>TOTAL</b>	<b>54</b>

\*Unspecified distribution between General Surgery, Internal Medicine, Ob-Gyn, Pediatrics, Anesthesiology

The Radiology program aims to contribute to achieving 69% of this public sector workforce target (37 health workers out of a target of 54); the expected contribution of the program toward achieving the national target is indicated in Figure 10.6.5.1.

Figure 10.6.5.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Radiology



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.6.5.2 Training Targets

In order to achieve the programmatic target of 37 radiologists in the public sector and achieve sustainability of Radiology training program, the following enrollment and graduation scenario is planned (Table 10.6.5.B). The program aims to enroll 10 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 37 students and yield roughly 8 graduates per year.

Table 10.6.5.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Radiology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	7	12	17	24	30	34	35	37	37	37	
Year 1 Intake	4	6	8	8	10	10	10	10	10	10	<b>Total</b>
Expected Graduates*	3	0	2	0	3	5	7	7	8	8	<b>43</b>

\*figures are rounded to match total as needed

### 10.6.5.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.6.5.C

Table 10.6.5.C: Faculty Gaps and Requirements | Physician: Radiology

Faculty	Required	Currently Available	Gap
General Radiology	8	1	7
Radiological Anatomy	2	0	2
Emergency Radiology	2	0	2
Pediatric Radiology	2	0	2
Neuroradiology	2	0	2
Musculoskeletal (MSK) Radiology	2	0	2
Abdominal Radiology	2	0	2
Head and Neck Imaging	2	0	2
Interventional/Vascular Radiology	2	0	2
Nuclear imaging and Radiotherapy	2	0	2
Cardiothoracic Imaging	2	0	2
Radiological Physics	2	0	2
Urogenital Imaging	2	0	2
Breast Imaging	2	0	2
Research methodology	0	0	0
<b>TOTAL</b>	<b>34</b>	<b>1</b>	<b>33</b>

It is proposed that 8 of the total gap of 33 faculty (Table 10.6.5.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.6.5.D: Immediate Faculty Hiring Targets | Physician: Radiology

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General Radiology	8	1	5	2
Radiological Anatomy	2	0	0	2
Emergency Radiology	2	0	0	2
Pediatric Radiology	2	0	0	2
Neuroradiology	2	0	0	2
Musculoskeletal (MSK) Radiology	2	0	0	2
Abdominal Radiology	2	0	1	1
Head and Neck Imaging	2	0	0	2
Interventional/Vascular Radiology	2	0	1	1
Nuclear imaging and Radiotherapy	2	0	1	1
Cardiothoracic Imaging	2	0	0	2
Radiological Physics	2	0	0	2
Urogenital Imaging	2	0	0	2
Breast Imaging	2	0	0	2
Research methodology	0	0	0	0
<b>TOTAL</b>	<b>34</b>	<b>1</b>	<b>8</b>	<b>25</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

To fulfill faculty requirements, Table 10.6.5.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.6.5.E: Total Study Abroad Needs | Physician: Radiology

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General Radiology	0	0	0	0	0	0	0	0	0	0	0
Radiological Anatomy	2	0	1	1	0	0	0	0	0	0	0
Emergency Radiology	1	0	1	0	1	0	0	0	0	0	0
Pediatric Radiology	2	0	0	1	0	0	0	0	1	0	0
Neuroradiology	2	0	0	0	0	1	0	0	1	0	0
Musculoskeletal (MSK) Radiology	2	0	0	0	0	1	0	0	1	0	0
Abdominal Radiology	2	0	0	0	0	1	0	0	0	0	0
Head and Neck Imaging	2	0	0	0	0	0	0	1	1	1	0
Interventional/Vascular Radiology	2	0	0	0	0	1	0	0	0	1	0
Nuclear imaging and Radiotherapy	2	0	0	0	0	1	0	0	0	0	0
Cardiothoracic Imaging	2	0	0	0	0	1	0	0	0	0	1
Radiological Physics	2	0	0	0	0	0	0	0	2	0	0
Urogenital Imaging	2	0	0	0	0	0	0	2	0	0	1
Breast Imaging	2	0	0	0	0	0	0	1	1	0	0
Research methodology	2	0	0	0	0	0	0	0	0	0	1
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>4</b>	<b>7</b>	<b>2</b>	<b>3</b>

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.6.5.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.6.5.F: Total Visiting Faculty Needs (FTE) | Physician: Radiology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	7	12	17	24	30	34	35	37	37	37
General Radiology	0	0	0	0	0	0	0	0	0	0
Radiological Anatomy	0.3	0.3	0.3	0	0	0	0	0	0	0
Emergency Radiology	0.3	0.3	0.3	0	0	0	0	0	0	0
Pediatric Radiology	0.3	0.3	0.3	0.3	0	0.3	0.3	0.3	0.3	0
Neuroradiology	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.3	0
Musculoskeletal (MSK) Radiology	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.3	0
Abdominal Radiology	0	0	0	0	0	0.3	0	0	0	0
Head and Neck Imaging	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.3	0
Interventional/Vascular Radiology	0.2	0	0	0	0	0.2	0	0	0	0
Nuclear imaging and Radiotherapy	0	0	0	0	0	0.1	0	0	0	0
Cardiothoracic Imaging	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0
Radiological Physics	0.04	0.04	0.04	0.04	0.04	0.08	0.08	0.08	0.08	0
Urogenital Imaging	0	0	0	0	0	0	0	0	0	0
Breast Imaging	0	0	0	0	0	0	0	0	0	0
Research methodology	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>2.14</b>	<b>1.94</b>	<b>1.94</b>	<b>1.34</b>	<b>1.04</b>	<b>2.58</b>	<b>1.48</b>	<b>1.48</b>	<b>1.28</b>	<b>0</b>

## 10.7 ORAL HEALTH

### 10.7.1 Objectives & Workforce Targets

The program aims to improve the availability and coverage of 2 services in Rwanda by increasing the availability of qualified and competent providers in this service area.

Table 10.7.1.A National Health Workforce Targets | Oral Health

Cadre	National Health Workforce Target 2030
Dental Therapist (A0)	1244
Dental Surgeon (A0)	124

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

### 10.7.2 Dental Therapist (A0)

#### 10.7.2.1 Objective & Workforce Targets

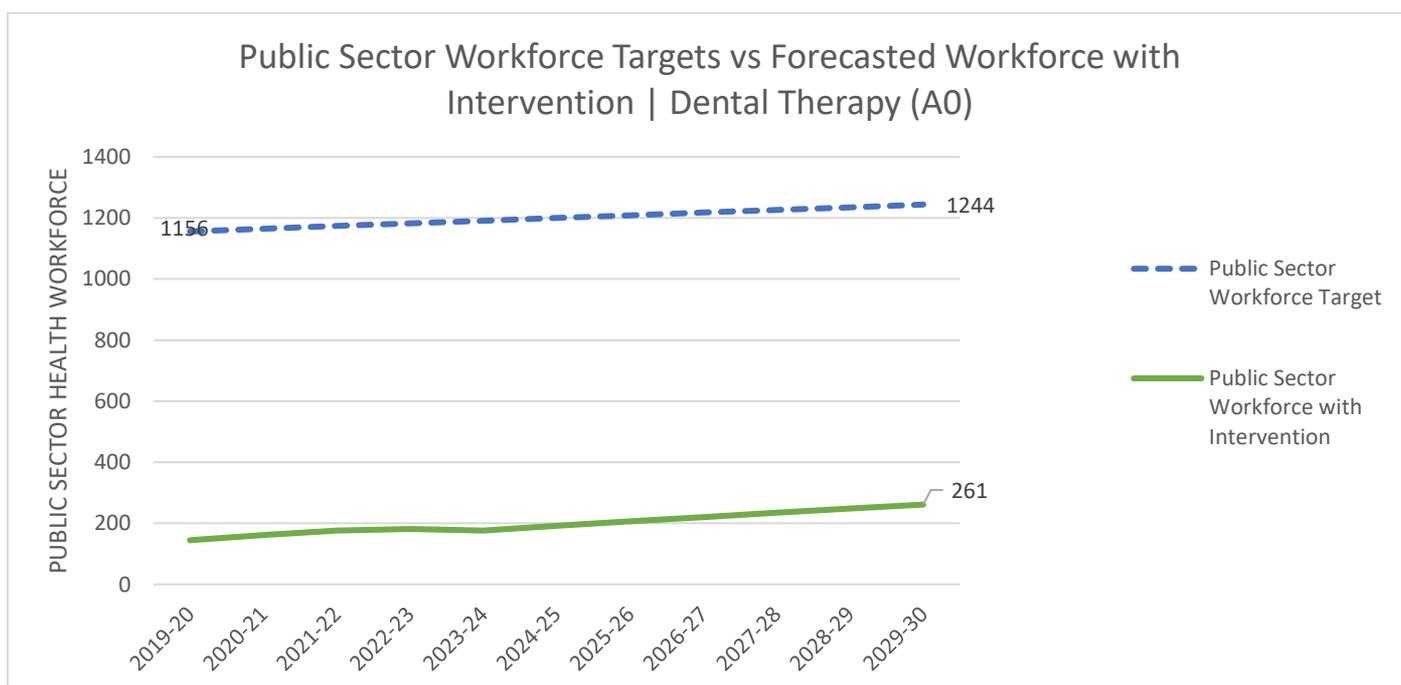
As of January 2020, Rwanda had 113 dental therapists working in the public sector health workforce—an increase from 105 in 2011 as a result of the HRH Program 2012-19. Over the next 10 years, MOH aims to have 1244 dental therapists in the public sector by deploying them according to the facility staffing norms described below in Table 10.7.2.A.

Table 10.7.2.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Dental Therapist (A0)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
	<i>n/a</i>	2	540	1080
District Hospital	3	4	40	160
Provincial Hospital	4	1	4	4
Referral Hospital	2	0	3	0
Teaching Hospital	4	0	4	0
<b>TOTAL</b>				<b>1244</b>

The dental therapist program aims to contribute to achieving 21% of this public sector workforce target (261 health workers out of a target of 1244); the expected contribution of the program toward achieving the national target is indicated in Figure 10.7.2.1.

Figure 10.7.2.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Dental Therapist (A0)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.7.2.2 Training Targets

In order to achieve the programmatic target of 261 dental therapists in the public sector and achieve sustainability of the Dental Therapist training program, the following enrollment and graduation scenario is planned (Table 10.7.2.B). The program aims to enroll 30 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 119 students and yield roughly 30 graduates per year.

Table 10.7.2.B: Enrollment & Graduation Targets to Achieve Objectives | Dental Therapist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	73	76	90	119	119	119	119	119	119	119	
Year 1 Intake	30	30	30	30	30	30	30	30	30	30	<b>Total</b>
Expected Graduates*	30	27	16	0	29	29	29	30	30	30	<b>250</b>

\*figures are rounded to match total as needed

### 10.7.2.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.7.2.C.

Table 10.7.2.C: Faculty Gaps and Requirements | Dental Therapist (A0)

Faculty	Required	Currently Available	Gap
Dental Therapy (A0)	15	13	2
Dental Surgery (A0)	3	0	3
Oral Microbiology	2	0	2
Oral Biology	2	0	2
Pediatric Dentists	2	0	2
Orthodontists	2	0	2
Dental Public Health	2	0	2
Oral Pathologist	2	0	2
Periodontist	2	0	2
Prosthodontics	2	0	2
Restorative and Endodontics	2	0	2
Maxillofacial Surgeon	2	1	1
Community Dentistry	0	0	0
<b>TOTAL</b>	<b>38</b>	<b>14</b>	<b>24</b>

It is proposed that 8 of the total gap of 24 faculty (Table 10.7.2.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.7.2.D: Immediate Faculty Hiring Targets | Dental Therapist (A0)

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Dental Therapy (A0)	15	13	2	0
Dental Surgery (A0)	3	0	3	0
Oral Microbiology	2	0	0	2
Oral Biology	2	0	0	2
Pediatric Dentists	2	0	0	2
Orthodontists	2	0	2	0
Dental Public Health	2	0	0	2
Oral Pathologist	2	0	0	2
Periodontist	2	0	0	2
Prosthodontics	2	0	1	1
Restorative and Endodontics	2	0	0	2
Maxillofacial Surgeon	2	1	0	1
Community Dentistry	0	0	0	0
<b>TOTAL</b>	<b>38</b>	<b>14</b>	<b>8</b>	<b>16</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications. To fulfill faculty requirements, Table 10.7.2.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.7.2.E: Total Study Abroad Needs | Dental Therapist (A0)

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Dental Therapy (A0)	4	0	0	0	0	0	0	0	0	0	0
Dental Surgery (A0)	0	0	0	0	0	0	0	0	0	0	0
Oral Microbiology	2	0	2	0	0	0	0	0	0	0	0
Oral Biology	2	0	2	0	0	0	0	0	0	0	0
Pediatric Dentist	3	0	0	0	0	0	0	0	0	0	0
Orthodontist	0	0	0	0	0	0	0	0	0	0	0
Dental Public Health	3	0	2	0	0	0	0	0	0	0	0
Oral pathologist	3	0	0	0	0	0	0	0	0	0	0
Periodontist	3	0	2	0	0	0	0	0	0	0	0
Prosthodontics	3	0	1	0	0	0	0	0	0	0	0
Restorative and endodontics	3	0	0	0	0	0	0	0	0	0	0
Maxillofacial Surgeon	3	0	0	0	0	0	0	0	0	0	0
Community dentistry	3	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>9</b>	<b>0</b>							

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.7.2.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.7.2.F: Total Visiting Faculty Needs (FTE) | Dental Therapist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	73	76	90	119	119	119	119	119	119	119
Dental Therapy (A0)	0	0	0	0	0	0	0	0	0	0
Dental Surgery (A0)	0	0	0	0	0	0	0	0	0	0
Oral Microbiology	0.3	0.3	0.3	0	0	0	0	0	0	0
Oral Biology	0.3	0.3	0.3	0	0	0	0	0	0	0
Pediatric Dentist	0.3	0.3	0.3	0.5	0	0	0	0	0	0
Orthodontist	0	0	0	0	0	0	0	0	0	0
Dental Public Health	0.3	0.3	0.3	0.5	0	0	0	0	0	0
Oral pathologist	0.3	0.3	0.3	0.5	0	0	0	0	0	0
Periodontist	0.3	0.3	0.3	0.5	0	0	0	0	0	0
Prosthodontics	0	0	0	0.3	0	0	0	0	0	0
Restorative and endodontics	0.3	0.3	0.3	0.5	0	0	0	0	0	0
Maxillofacial Surgeon	0	0	0	0	0	0	0	0	0	0
Community dentistry	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>2.1</b>	<b>2.1</b>	<b>2.1</b>	<b>2.8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### 10.7.3 Dental Surgeon (A0)

#### 10.7.3.1 Objective & Workforce Targets

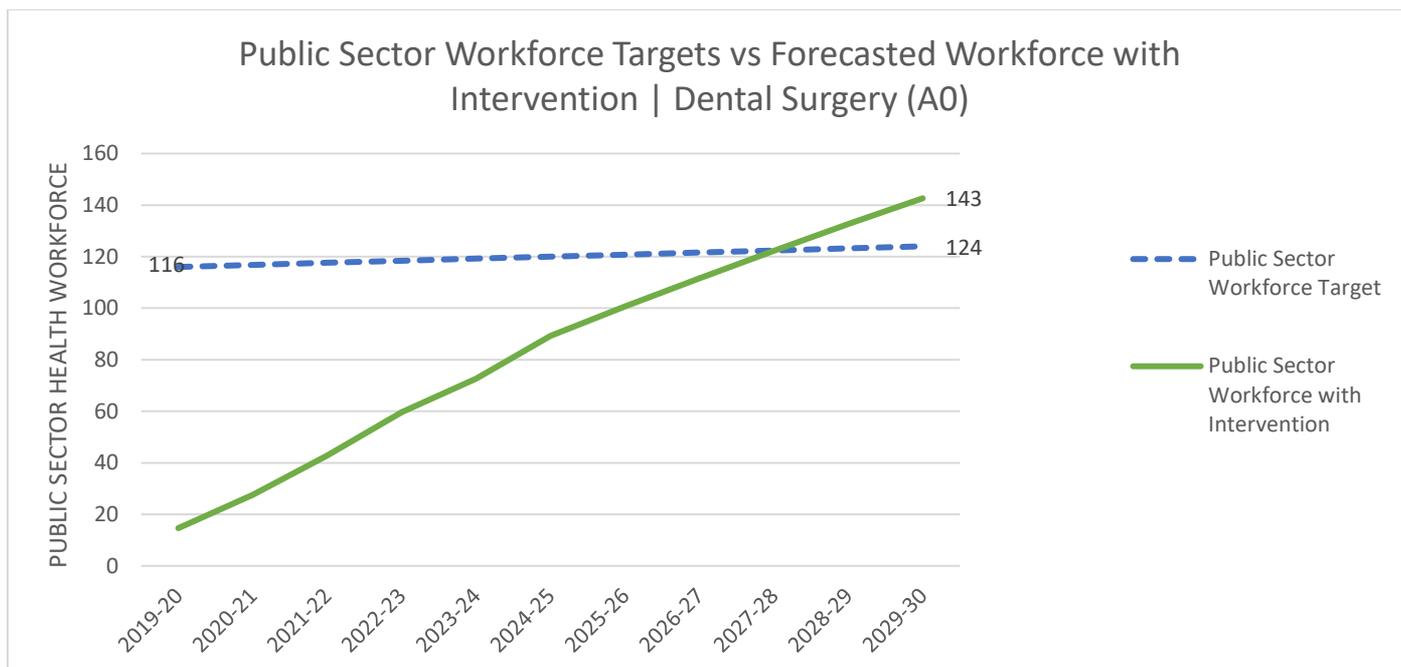
As of January 2020, Rwanda had 5 dental surgeons working in the public sector health workforce—a decrease from 11 in 2011 (the first class of Dental Surgeon graduates entered the workforce after the end of the HRH Program 2011-2019). Over the next 10 years, MOH aims to have 124 dental surgeons in the public sector by deploying them according to the facility staffing norms described below in

Table 10.7.3.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Dental Surgeon (A0)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	2	40	80
Provincial Hospital	<i>n/a</i>	2	4	8
Referral Hospital	<i>n/a</i>	4	3	12
Teaching Hospital	<i>n/a</i>	6	4	24
<b>TOTAL</b>				<b>124</b>

The dental surgery program aims to contribute to achieving 115% of this public sector workforce target (143 health workers out of a target of 124); the expected contribution of the program toward achieving the national target is indicated in Figure 10.7.3.1.

Figure 10.7.3.1: Public Sector Health Workforce Targets vs. Forecasted Production | Dental Surgeon (A0)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.7.3.2 Training Targets

In order to achieve the programmatic target of 143 dental surgeons in the public sector and achieve sustainability of the Dental Surgery (A0) training program, the following enrollment and graduation scenario is planned (Table 10.7.3.B). The program aims to enroll 20 new trainees every year, starting in academic year 2020-21. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 100 students and yield roughly 20 graduates per year.

Table 10.7.3.B: Enrollment & Graduation Targets to Achieve Objectives | Dental Surgeon (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	114	108	107	100	100	100	100	100	100	100	
Year 1 Intake	20	20	20	20	20	20	20	20	20	20	<b>Total</b>
Expected Graduates*	26	21	27	20	20	20	20	20	20	20	<b>214</b>

\*figures are rounded to match total as needed

### 10.7.3.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.7.3.C.

Table 10.7.3.C: Faculty Gaps and Requirements | Dental Surgeon (A0)

Faculty	Required	Currently Available	Gap
General Dental Surgery	10	0	10
Periodontist	2	0	2
Prosthodontics	2	1	1
Oral Maxillofacial Surgery	2	1	1
Restorative Dentist /endodontics	2	2	0
Oral Pathology	2	2	0
Oral Medicine	2	0	2
Pediatric Dentistry	2	0	2
Orthodontist	2	1	1
Community Dentist	2	0	2
<b>TOTAL</b>	<b>28</b>	<b>7</b>	<b>21</b>

Given there are no available specialists in Rwanda with the requisite expertise to fill these positions, it is proposed that 0 of the total gap of 21 faculty (Table 10.7.2.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. One of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.7.3.D: Immediate Faculty Hiring Targets | Dental Surgeon (A0)

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General Dental Surgery	10	0	0	10
Periodontist	2	0	0	1
Prosthodontics	2	1	0	0
Oral Maxillofacial Surgery	2	1	0	0
Restorative Dentist /endodontics	2	2	0	0
Oral Pathology	2	2	0	0
Oral Medicine	2	0	0	1
Pediatric Dentistry	2	0	0	1
Orthodontist	2	1	0	0
Community Dentist	2	0	0	1
<b>TOTAL</b>	<b>28</b>	<b>7</b>	<b>0</b>	<b>14</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications.

To fulfill faculty requirements, Table 10.7.2.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.7.3.E: Total Study Abroad Needs | Dental Surgeon (A0)

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
General Dental Surgery	0	0	0	0	0	0	0	0	0	0	0
Periodontist	3	0	2	0	0	0	0	0	0	0	0
Prosthodontics	3	0	0	0	0	0	0	0	0	0	0
Oral Maxillofacial Surgery	3	0	1	0	0	0	0	0	0	0	0
Restorative Dentist / endodontics	3	0	2	0	0	0	0	0	0	0	0
Oral Pathology	3	0	2	0	0	0	0	0	0	0	0
Oral Medicine	3	0	1	0	0	0	0	0	0	0	0
Pediatric Dentistry	3	0	3	0	0	0	0	0	0	0	0
Orthodontist	3	0	0	0	0	0	0	0	0	0	0
Community Dentist	3	0	1	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>12</b>	<b>0</b>							

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.7.2.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.7.3.F: Total Visiting Faculty Needs (FTE) | Dental Surgeon (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	114	108	107	100	100	100	100	100	100	100
General Dental Surgery	0	0	0	0	0	0	0	0	0	0
Periodontist	1	1	1	1	0	0	0	0	0	0
Prosthodontics	0	0	0	0	0	0	0	0	0	0
Oral Maxillofacial Surgery	1	1	0	0	0	0	0	0	0	0
Restorative Dentist / endodontics	0	0	0	0	0	0	0	0	0	0
Oral Pathology	0	0	0	0	0	0	0	0	0	0
Oral Medicine	1	1	1	1	0	0	0	0	0	0
Pediatric Dentistry	1	1	1	1	0	0	0	0	0	0
Orthodontist	0	0	0	0	0	0	0	0	0	0
Community Dentist	1	1	1	1	0	0	0	0	0	0
<b>TOTAL</b>	<b>5</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.8 SENSORY SERVICES

### 10.8.1 Cluster Objectives & Workforce Targets

The program aims to improve the availability and coverage of 3 services in Rwanda by increasing the availability of qualified and competent providers in this service area.

Table 10.8.1.A National Health Workforce Targets | Sensory Services

Program Areas	National Health Workforce Target 2030
Audiologist (A0)	121
Speech Therapist (A0)	121
Physician: Ophthalmology	44

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

### 10.8.2 Audiologist (A0)

#### 10.8.2.1 Objective & Workforce Targets

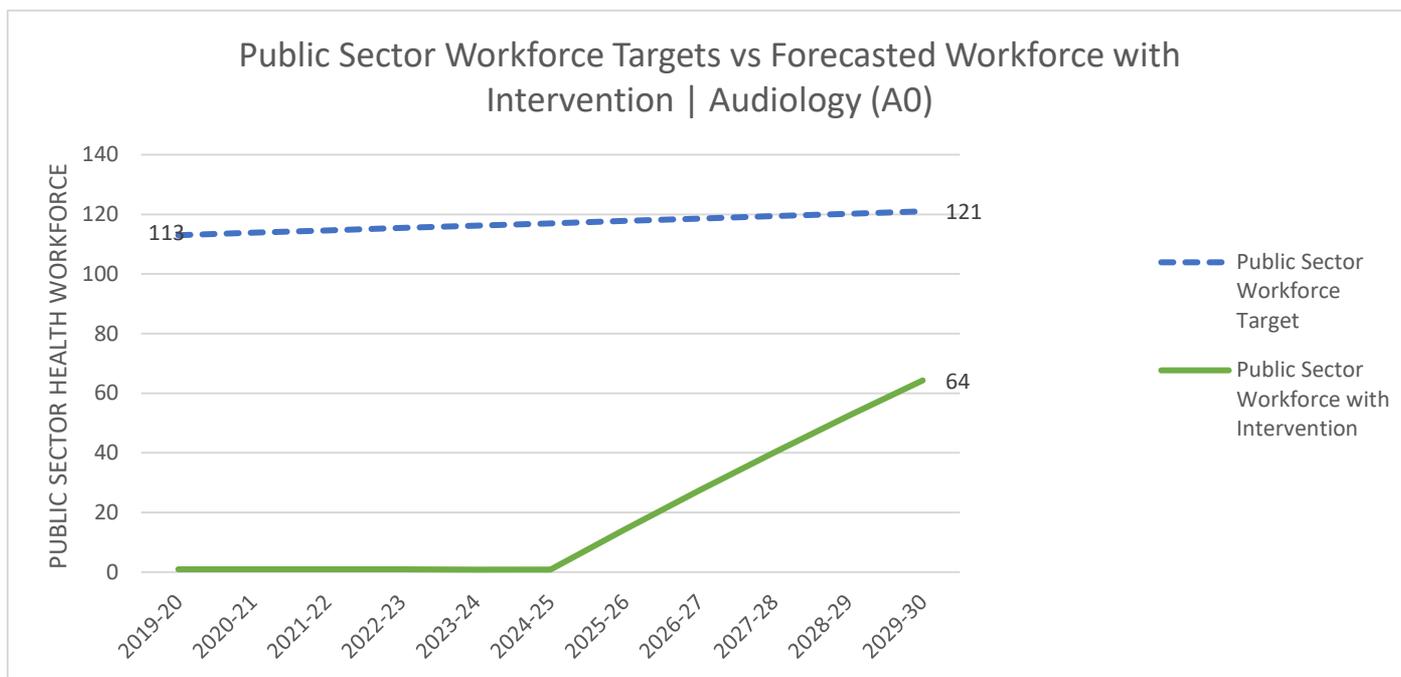
As of January 2020, Rwanda had 1 audiologist working in the public sector health workforce. Over the next 10 years, MOH aims to have 121 audiologists in the public sector by deploying them according to the facility staffing norms described below in Table 10.8.2.A.

Table 10.8.2.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Audiologist (A0)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	2	40	80
Provincial Hospital	<i>n/a</i>	3	4	12
Referral Hospital	<i>n/a</i>	3	3	9
Teaching Hospital	<i>n/a</i>	5	4	20
<b>TOTAL</b>				<b>121</b>

The Audiologist program aims to contribute to achieving 53% of this public sector workforce target (64 health workers out of a target of 121; the expected contribution of the program toward achieving the national target is indicated in Figure 10.8.2.i.

Figure 10.8.2.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Audiologist (A0)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.8.2.2 Training Targets

In order to achieve the programmatic target of 64 audiologists in the public sector and achieve sustainability of the Audiology (A0) training program, the following enrollment and graduation scenario is planned (Table 10.8.2.B). The program aims to enroll 15 new trainees every year, starting in academic year 2020-21. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 60 students and yield roughly 15 graduates per year.

Table 10.8.2.B: Enrollment & Graduation Targets to Achieve Objectives | Audiologist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	0	15	30	45	60	60	60	60	60	60	
Year 1 Intake	0	15	15	15	15	15	15	15	15	15	<b>Total</b>
Expected Graduates*	0	0	0	0	0	15	15	15	15	15	<b>75</b>

\*figures are rounded to match total as needed

### 10.8.2.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.8.2.C.

Table 10.8.2.C: Faculty Gaps and Requirements | Audiologist (A0)

Faculty	Required	Currently Available	Gap
Audiology (A0)	2	0	2
Audiology with masters	3	0	3
<b>TOTAL</b>	<b>5</b>	<b>0</b>	<b>5</b>

Given there are no available specialists in Rwanda with the requisite expertise to fill these positions, it is proposed that 0 of the total gap of 5 faculty (Table 10.8.2.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.8.2.D: Immediate Faculty Hiring Targets | Audiologist (A0)

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Audiology	2	0	0	2
Audiology with masters	3	0	0	3
<b>TOTAL</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>5</b>

Rwanda will have to send individuals abroad to gain the necessary qualifications to become faculty.

To fulfill faculty requirements, Table 10.8.2.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.8.2.E: Total Study Abroad Needs | Audiologist (A0)

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Audiology	0	0	0	0	0	0	0	0	0	0	0
Audiology with Masters	2	0	0	0	0	0	0	0	3	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>						

\*A comprehensive data analysis will be carried out during the implementation of the NSHPD to determine the full scope of need in terms of leveraging abroad opportunities for students pursuing Audiology

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees.

Table 10.8.2.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.8.2.F: Total Visiting Faculty Needs (FTE) | Audiologist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	0	15	30	45	60	60	60	60	60	60
Audiology	0.0	1.0	1.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0
Audiology with masters	0.0	1.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	0.0
<b>TOTAL</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>0</b>

### 10.8.3 Speech Therapist (A0)

#### 10.8.3.1 Objective & Workforce Targets

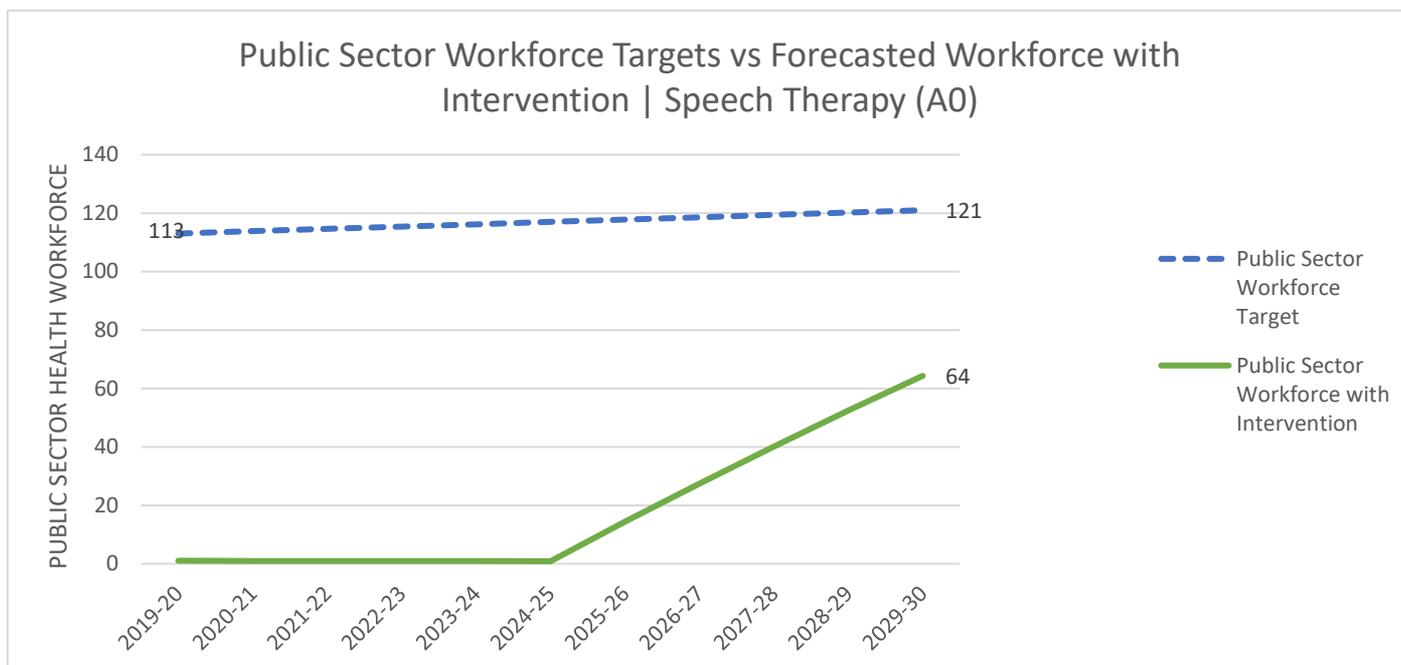
As of January 2020, Rwanda had 1 speech therapist working in the public sector health workforce. Over the next 10 years, MOH aims to have 121 speech therapists in the public sector by deploying them according to the facility staffing norms described below in Table 10.8.3.A.

Table 10.8.3.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Speech Therapist (A0)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	2	40	80
Provincial Hospital	<i>n/a</i>	3	4	12
Referral Hospital	<i>n/a</i>	3	3	9
Teaching Hospital	<i>n/a</i>	5	4	20
<b>TOTAL</b>				<b>121</b>

The speech therapist program aims to contribute to achieving 53% of this public sector workforce target (64 health workers out of a target of 121); the expected contribution of the program toward achieving the national target is indicated in Figure 10.8.3.1.

Figure 10.8.3.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Speech Therapist (A0)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.8.3.2 Training Targets

In order to achieve the programmatic target of 64 speech therapists in the public sector and achieve sustainability of the Speech Therapy (A0) training program, the following enrollment and graduation scenario is planned (Table 10.8.3.B). The program aims to enroll 15 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 60 students and yield roughly 15 graduates per year.

Table 10.8.3.B: Enrollment & Graduation Targets to Achieve Objectives | Speech Therapist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	0	15	30	45	60	60	60	60	60	60	
Year 1 Intake	0	15	15	15	15	15	15	15	15	15	<b>Total</b>
Expected Graduates*	0	0	0	0	0	15	15	15	15	15	<b>75</b>

\*figures are rounded to match total as needed

### 10.8.3.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.8.3.C.

Table 10.8.3.C: Faculty Gaps and Requirements | Speech Therapist (A0)

Faculty	Required	Currently Available	Gap
Speech Therapist	2	0	2
Speech Therapist with Masters	3	0	3
<b>TOTAL</b>	<b>5</b>	<b>0</b>	<b>5</b>

Given there are no available specialists in Rwanda with the requisite expertise to fill these positions, it is proposed that 0 of the total gap of 5 faculty (Table 10.8.3.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.8.3.D: Immediate Faculty Hiring Targets | Speech Therapist (A0)

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Speech Therapist	2	0	0	2
Speech Therapist with masters	3	0	0	3
<b>TOTAL</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>5</b>

Rwanda will need to send individuals abroad to gain the necessary qualifications to become faculty. To fulfill faculty requirements, Table 10.8.3.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.8.3.E: Total Study Abroad Needs | Speech Therapist (A0)

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Speech Therapist	0	0	0	0	0	0	0	0	0	0	0
Speech Therapist with masters	2	0	0	0	0	0	0	0	3	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>						

\*A comprehensive data analysis will be carried out during the implementation of the NSHPD to determine the full scope of need in terms of leveraging abroad opportunities for students pursuing Speech Therapy

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.8.3.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.8.3.F: Total Visiting Faculty Needs (FTE) | Speech Therapist (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	0	15	30	45	60	60	60	60	60	60
Speech Therapist	0	0	0	0	0	0	0	0	0	0
Speech Therapist with Masters	0	5	5	5	5	5	3	3	3	0
<b>TOTAL</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>0</b>

## 10.8.4 Physician: Ophthalmology

### 10.8.4.1 Objective & Workforce Targets

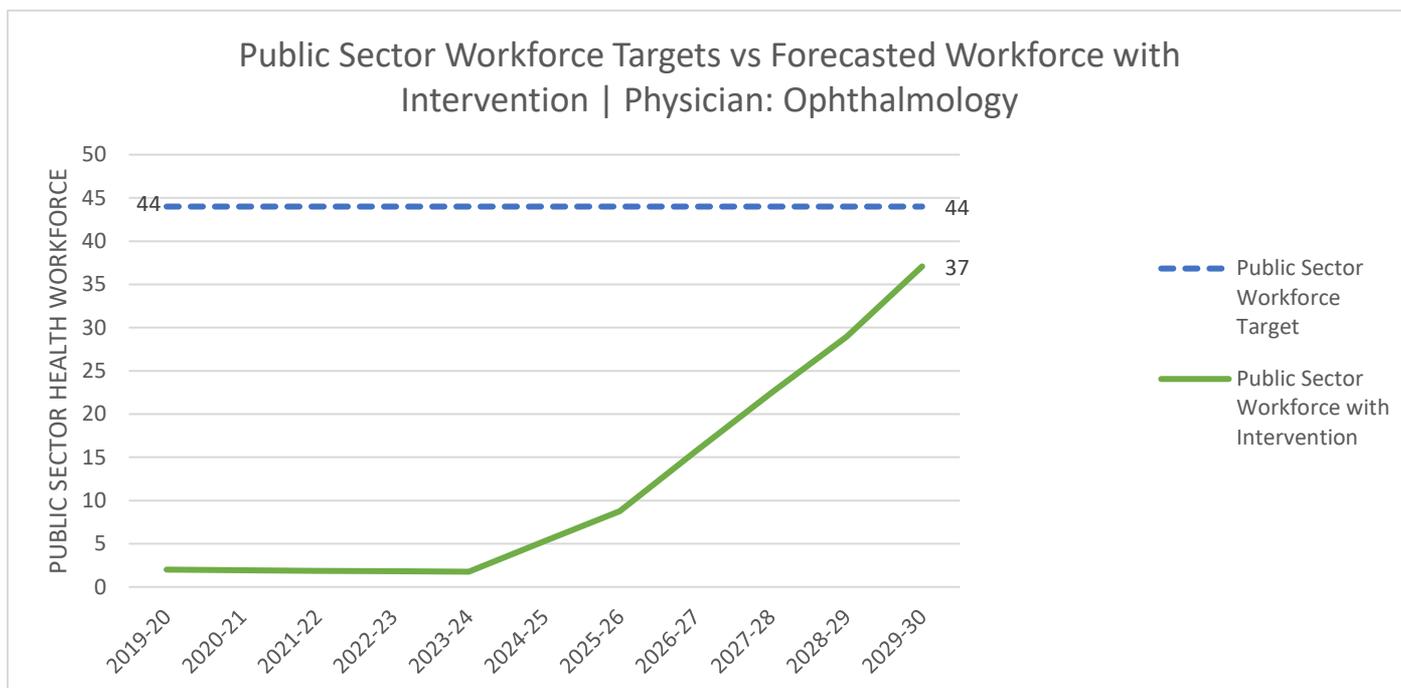
As of January 2020, Rwanda had 2 ophthalmologists working in the public sector health workforce. Over the next 10 years, MOH aims to have 44 ophthalmologists in the public sector by deploying them according to the facility staffing norms described below in Table 10.8.4.A.

Table 10.8.4.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Physician: Ophthalmology

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	0	40	0
Provincial Hospital	<i>n/a</i>	2	4	8
Referral Hospital	<i>n/a</i>	4	3	12
Teaching Hospital	<i>n/a</i>	6	4	24
			<b>TOTAL</b>	<b>44</b>

The Physician: Ophthalmology program aims to contribute to achieving 84% of this public sector workforce target (37 health workers out of a target of 44); the expected contribution of the program toward achieving the national target is indicated in Figure 10.8.4.1.

Figure 10.8.4.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Physician: Ophthalmology



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.8.4.2 Training Targets

In order to achieve the programmatic target of 37 ophthalmologists in the public sector and achieve sustainability of the Ophthalmology training program, the following enrollment and graduation scenario is planned (Table 10.8.4.B). The program aims to enroll 10 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 30 students and yield roughly 10 graduates per year.

Table 10.8.4.B: Enrollment & Graduation Targets to Achieve Objectives | Physician: Ophthalmology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	4	8	16	20	24	26	28	30	30	30	
Year 1 Intake	4	4	8	8	8	10	10	10	10	10	<b>Total</b>
Expected Graduates*	0	0	0	0	4	4	8	8	8	10	<b>42</b>

\*figures are rounded to match total as needed

### 10.8.4.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.8.4.C.

Table 10.8.4.C: Faculty Gaps and Requirements | Physician: Ophthalmology

Faculty	Required	Currently Available	Gap
Generalist Ophthalmologist	4	1	3
Cornea and Anterior segment	2	1	1
Paediatric ophthalmology	2	0	2
Oculoplastic and reconstruction	2	0	2
Glaucoma	2	0	2
Vitreo-retinal surgeon	2	0	2
Medical retina specialist	2	1	1
<b>TOTAL</b>	<b>16</b>	<b>3</b>	<b>13</b>

It is proposed that 4 of the total gap of 13 faculty (Table 10.8.4.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.8.4.D: Immediate Faculty Hiring Targets | Physician: Ophthalmology

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Generalist Ophthalmologist	4	1	4	0
Cornea and Anterior segment ophthalmology	2	1	0	1
Paediatric ophthalmology	2	0	0	2
Oculoplastic and reconstructive ophthalmology	2	0	0	2
Glaucoma	2	0	0	2
Vitreo-retinal surgeon	2	0	0	2
Medical retina specialist	2	1	0	1
<b>TOTAL</b>	<b>16</b>	<b>3</b>	<b>4</b>	<b>10</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to sub-specialize.

No study abroad interventions have been planned for Ophthalmology.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.8.4.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.8.4.E: Total Visiting Faculty Needs (FTE) | Physician: Ophthalmology

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	4	8	16	20	24	26	28	30	30	30
Generalist Ophthalmologist	0	0	1	1	2	2	2	2	2	2
Cornea and Anterior segment	1	1	2	2	2	2	2	2	2	2
Paediatric ophthalmology	0	0	0	0	0	0	0	0	0	0
Oculoplastic and reconstructive	0	0	0	0	0	0	0	0	0	0
Glaucoma	0	0	0	0	0	0	0	0	0	0
Vitreo-retinal surgeon	1	1	2	2	2	2	2	2	2	2
Medical retina specialist	1	1	2	2	2	2	2	2	2	2
<b>TOTAL</b>	<b>3</b>	<b>3</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>

## 10.9 LEADERSHIP AND MANAGEMENT

### 10.9.1 Objectives & Workforce Targets

The program aims to improve the availability and coverage of 2 services in Rwanda by increasing the availability of qualified and competent providers in this service area.

Table 10.9.1.A National Health Workforce Targets | Leadership and Management

Program Areas	National Health Workforce Target 2030
Master of Hospital and Healthcare Administration	172
Nurse: Education, Leadership, and Management	79

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

### 10.9.2 Master of Nursing: Education, Leadership, and Management

#### 10.9.2.1 Objective & Workforce Targets

As of January 2020, Rwanda had 14 education, leadership, and management nurses working in the public sector health workforce. Over the next 10 years, MOH aims to have 79 education, leadership, and management nurses in the public sector by deploying them according to the facility staffing norms described below in Table 10.9.2.A

Table 10.9.2.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Master of Nursing: Education, Leadership, and Management

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	n/a	0	540	0
District Hospital	n/a	1	40	40
Provincial Hospital	n/a	1	4	4
Referral Hospital	n/a	1	3	3
Teaching Hospital	n/a	8	4	32
<b>TOTAL</b>				<b>79</b>

\*MoH has not previously indicated norms or targets for specialized nurses

The Education, Leadership, and Management program aims to contribute to achieving 99% of this public sector workforce target (78 health workers out of a target of 79); the expected contribution of the program toward achieving the national target is indicated in Figure 10.9.2.1.

Figure 10.9.2.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Master of Nursing: Education, Leadership, and Management



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.9.2.2 Training Targets

In order to achieve the programmatic target of 78 education, leadership, and management nurses in the public sector and achieve sustainability of the Master of Nursing: Education, Leadership, and Management training program, the following enrollment and graduation scenario is planned (Table 10.9.2.B). The program aims to enroll 16 new trainees every other year, starting in academic year 2020-21. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 16 students and yield roughly 14 graduates per year.

Table 10.9.2.B: Enrollment & Graduation Targets to Achieve Objectives | Master of Nursing: Education, Leadership, and Management

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	11	16	15	16	15	16	15	16	15	16	
Year 1 Intake	0	16	0	16	0	16	0	16	0	16	<b>Total</b>
Expected Graduates*	0	11	0	14	0	14	0	15	0	15	<b>69</b>

\*figures are rounded to match total as needed

### 10.9.2.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.9.2.C.

Table 10.9.2.C: Faculty Gaps and Requirements | Master of Nursing: Education, Leadership, and Management

Faculty	Required	Currently Available	Gap
ELM Masters	3	3	0
ELM PhD	1	0	1
<b>TOTAL</b>	<b>4</b>	<b>3</b>	<b>1</b>

At this time there are no available providers to fill through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions (see Table 10.9.2.D. for further explanation.) To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions.

Table 10.9.2.D: Immediate Faculty Hiring Targets | Master of Nursing: Education, Leadership, and Management

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
ELM Masters	3	3	0	0
ELM PhD	1	0	0	1
<b>TOTAL</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>1</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications.

To fulfill faculty requirements, Table 10.9.2.E indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full time faculty and progress toward achieving sustainability for educational programs.

Table 10.9.2.E: Total Study Abroad Needs | Master of Nursing: Education, Leadership, and Management

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
ELM Masters	0	0	0	0	0	0	0	0	0	0	0
ELM PhD	4	1	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>1</b>	<b>0</b>								

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.9.2.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.9.2.F: Total Visiting Faculty Needs (FTE) | Master of Nursing: Education, Leadership, and Management

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	11	16	15	16	15	16	15	16	15	16
Visiting ELM Masters	0	0	0	0	0	0	0	0	0	0
Visiting ELM PhD	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>0</b>									

### 10.9.3 Master of Hospital and Healthcare Administration

#### 10.9.3.1 Objective & Workforce Targets

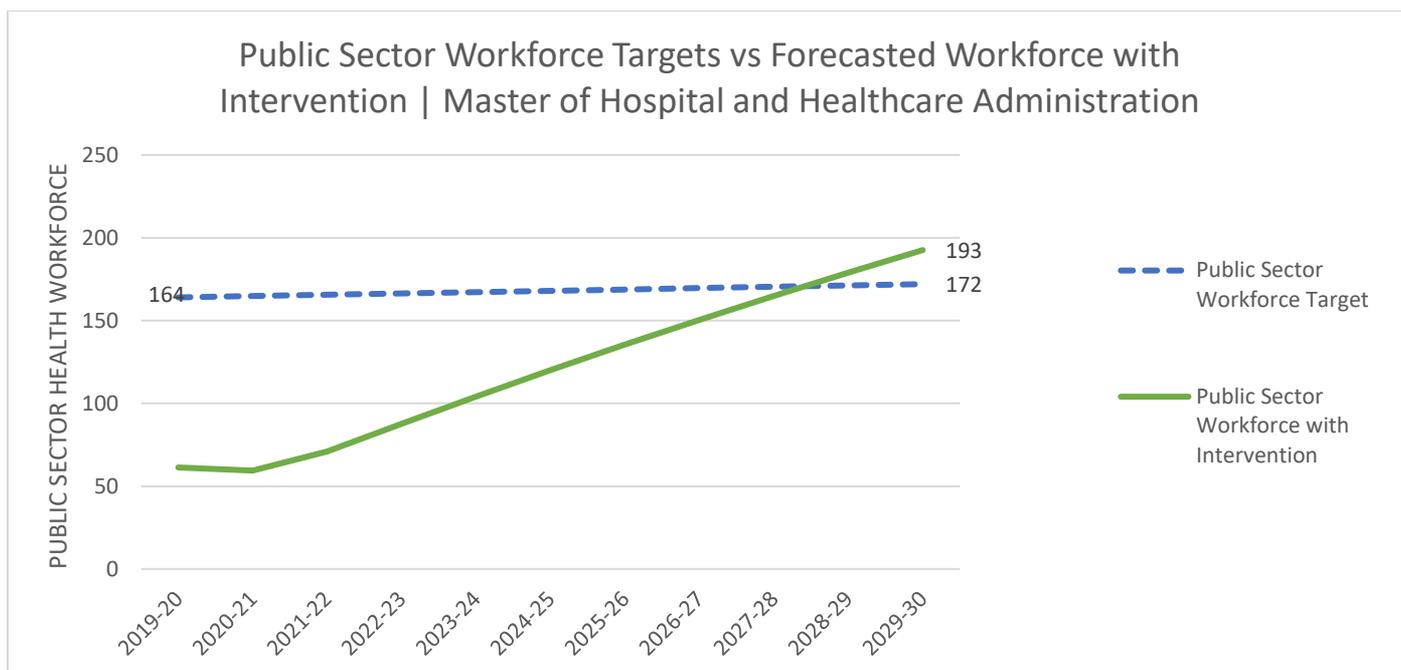
As of January 2020, Rwanda had 58 masters of hospital and healthcare administrators working in the public sector health workforce. Over the next 10 years, MOH aims to have 172 masters of hospital and healthcare administrators in the public sector by deploying them according to the facility staffing norms described below in Table 10.9.3.A.

Table 10.9.3.A: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Master of Hospital and Healthcare Administration

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
Health Center	<i>n/a</i>	0	540	0
District Hospital	<i>n/a</i>	2	40	80
Provincial Hospital	<i>n/a</i>	2	4	8
Referral Hospital	<i>n/a</i>	4	3	12
Teaching Hospital	<i>n/a</i>	18	4	72
<b>TOTAL</b>				<b>172</b>

The Master of Hospital and Healthcare Administration program aims to contribute to achieving 112% of this public sector workforce target (193 health workers out of a target of 172); the expected contribution of the program toward achieving the national target is indicated in Figure 10.9.3.1.

Figure 10.9.3.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Master of Hospital and Healthcare Administration



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.9.3.2 Training Targets

In order to achieve the programmatic target of 193 masters of hospital and healthcare administrators in the public sector and achieve sustainability of the Master of Hospital and Healthcare Administration training program, the following enrollment and graduation scenario is planned (Table 10.9.3.B). The program aims to enroll 20 new trainees every year, starting in academic year 2021-22. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 40 students and yield roughly 19 graduates per year.

Table 10.9.3.B: Enrollment & Graduation Targets to Achieve Objectives | Master of Hospital and Healthcare Administration

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	34	40	40	40	40	40	40	40	40	40	
Year 1 Intake	14	20	20	20	20	20	20	20	20	20	<b>Total</b>
Expected Graduates*	0	13	19	19	19	19	19	19	19	19	<b>165</b>

\*figures are rounded to match total as needed

### 10.9.3.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.9.3.C.

Table 10.9.3.C: Faculty Gaps and Requirements | Master of Hospital and Healthcare Administration

Faculty	Required	Currently Available	Gap
General MHA	2	1	1
Health Policy	0	0	0
Health Economist/Health Financing	0	0	0
Biostatistician/Epidemiologist/Researcher	0	0	0
Public Health (health system leadership, management, governance)	2	0	2
<b>TOTAL</b>	<b>4</b>	<b>1</b>	<b>3</b>

It is proposed that 3 of the total gap of 3 faculty (Table 10.9.3.D) will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required faculty positions.

Table 10.9.3.D: Immediate Faculty Hiring Targets | Master of Hospital and Healthcare Administration

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
General MHA	2	1	1	0
Health Policy	0	0	0	0
Health Economist/Health Financing	0	0	0	0
Biostatistician/Epidemiologist/Researcher	0	0	0	0
Public Health (health system leadership, management, governance)	2	0	2	0
<b>TOTAL</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>0</b>

While Rwanda has many generalists who can be hired or recaptured, or generalist graduates who could serve as faculty, some will have to be sent abroad to gain the necessary qualifications. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.9.3.E: Total Study Abroad Needs | Master of Hospital and Healthcare Administration

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
MHA PhD	4	0	1	0	0	0	0	0	0	0	0
Health Policy	4	0	0	0	0	0	0	0	0	0	0
Health Economist/Health Financing	4	0	0	0	0	0	0	0	0	0	0
Biostatistician/Epidemiologist/ Researcher	2	0	0	0	0	0	0	0	0	0	0
Public Health (health system leadership, management, governance)	4	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>1</b>	<b>0</b>							

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.9.3.F indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.9.3.F: Total Visiting Faculty Needs (FTE) | Master of Hospital and Healthcare Administration

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	34	40	40	40	40	40	40	40	40	40
General MHA	1	1	1	1	1	0	0	0	0	0
Health Policy	0	0	0	0	0	0	0	0	0	0
Health Economist/Health Financing	0	0	0	0	0	0	0	0	0	0
Biostatistician/Epidemiologist/ Researcher	0	0	0	0	0	0	0	0	0	0
Public Health (health system leadership, management, governance)	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 10.10 UNDERGRADUATE MEDICAL EDUCATION (A0)

### 10.10.1 Undergraduate Medical Education (A0)

The program aims to improve the availability and coverage of General Practitioners (graduates of the Undergraduate Medical Education (A0) program) in Rwanda by increasing the availability of qualified and competent providers in this service area.

In addition to increasing the number of General Practitioners available for service delivery coverage, improving the quality of providers has been highlighted as a critical need by stakeholders. Not only are General Practitioners on the front lines of health care delivery at all hospital levels, but they are also the pipeline for all the physician specialist and subspecialist training programs in the country. It is critical that all students who enter the medical field with the

intention of becoming a physician are trained to the highest standards of professionalism and quality care delivery. Some of the strategies to achieve this objective are detailed in the section “Implementation Strategies – Professionalism and Quality of Care” below.

Table 10.10.1.A National Health Workforce Targets | Undergraduate Medical Education (A0)

Program Area	National Health Workforce Target 2030
Undergraduate Medical Education (A0)	1018

The norms underlying the public sector workforce target for each cadre are detailed in the subsequent sections, as are corresponding training targets and intervention strategies.

#### 10.10.1.1 Objective & Workforce Targets

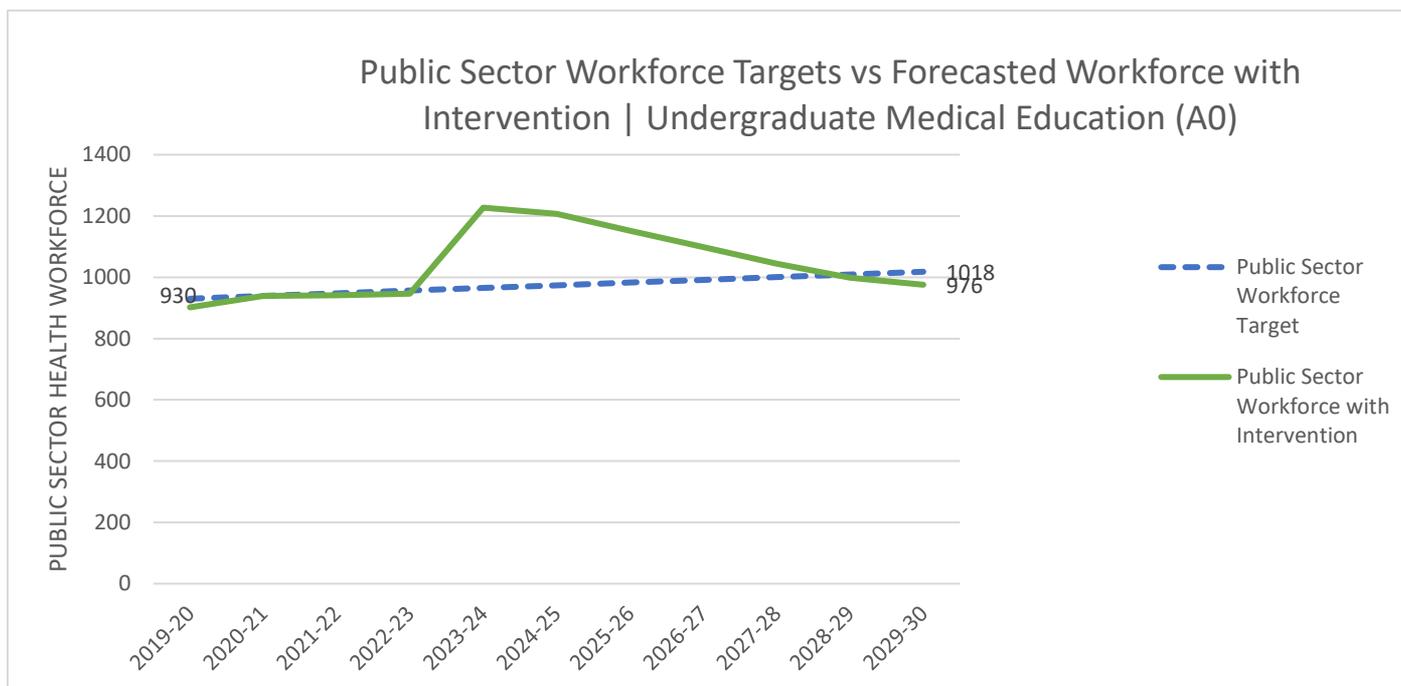
As of January 2020, Rwanda had 622 General Practitioners working in the public sector health workforce. Over the next 10 years, MOH aims to have 1018 General Practitioners in the public sector by deploying them according to the facility staffing norms described below in Table 10.10.1.B.

Table 10.10.1.B: National Health Workforce Targets 2030 by MOH Target Facility Staffing Norms | Undergraduate Medical Education (A0)

Facility Level	MOH Norm - Current	MOH Norm - Target	Expected Number of Facilities 2030	National Health Workforce Target 2030
District Hospital	10	22	40	880
Provincial Hospital	14	14	4	56
Referral Hospital	13	14	3	42
Teaching Hospital	2	10	4	40
<b>TOTAL</b>				<b>1018</b>

The Undergraduate Medical Education (A0) program aims to contribute to achieving 87% of this public sector workforce target by contributing 338 General Practitioners after adjusting for 1304 graduates who continue on to specialize; the expected contribution of the program toward achieving the national target is indicated in the below graph.

Figure 10.10.1.1: Public Sector Health Workforce Targets vs. Forecasted Workforce with Intervention | Undergraduate Medical Education (A0)



Note: forecasted workforce figures are estimated at close of fiscal year

### 10.10.1.2 Training Targets

In order to achieve the programmatic target of 976 General Practitioners in the public sector and achieve sustainability of the Undergraduate Medical Education (A0) training program, the following enrollment and graduation scenario is planned (Table 10.10.1.C). The program aims to enroll 200 new trainees every year, starting in academic year 2024-25. By 2030, assuming a 90% graduation rate, this will eventually lead to a total program enrollment of 1185 students and yield roughly 146 graduates per year.

Table 10.10.1.C: Enrollment & Graduation Targets to Achieve Objectives | Undergraduate Medical Education

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	
Total Enrollment	999	960	644	647	734	930	1014	1087	1136	1185	
Year 1 Intake	115	125	150	150	200	200	200	200	200	200	<b>Total</b>
Expected Graduates*	136	158	459	143	110	112	112	121	146	147	<b>1642</b>

\*figures are rounded to match total as needed

### 10.10.1.3 Faculty Interventions

According to departmental leadership, in order to sustain the planned program enrollment without the support of external visiting faculty, the program requires the faculty indicated in Table 10.10.1.D.

Table 10.10.1.D: Faculty Gaps and Requirements | Undergraduate Medical Education (A0)

Faculty	Required	Currently Available	Gap
Anatomy (I, II & III)	4	3	1
Biochemistry	3	1	2
Clinical Chemistry (I &II)	3	0	3
Embryology & Histology	2	0	2
Immunology, Microbiology & Parasitology	2	1	1
Hematology	4	0	2
Microbiology (I & II)	1	3	1
Nutrition & Dietetics	3	0	1
Pathology/ Systematic Pathology	1	3	0
Psychology	4	1	0
Physiology (I &II)	1	3	1
Pharmacology	2	0	1
Community Medicine	2	2	0
Genetics	2	2	0
<b>TOTAL</b>	<b>34</b>	<b>19</b>	<b>15</b>

Given there are no available specialists in Rwanda with the requisite expertise to fill these positions, it is proposed that 0 of the total gap of 15 faculty will be filled through immediate hiring or recapture of qualified providers who are currently practicing in the country and could be inclined and suited toward serving in academic positions. To fill remaining gaps, the program will implement an accelerated plan to retain high-performing graduates to serve as faculty. Some of these faculty will be retained as generalist faculty while others will be supported (primarily through study abroad) to further advance their qualifications and fill the required specialized faculty positions. The plan for immediate faculty hiring and graduate retention for faculty training is outlined in Table 10.10.1.E.

Table 10.10.1.E: Immediate Faculty Hiring Targets Undergraduate Medical Education (A0)

Faculty	Required	Currently Available	No. for Immediate Hiring or Recapture (2020)	Remaining Gap
Anatomy (I, II & III)	4	3	0	1
Biochemistry	3	1	0	2
Clinical Chemistry (I &II)	3	0	0	3
Embryology & Histology	2	0	0	2
Immunology, Microbiology & Parasitology	2	1	0	1
Hematology	4	0	0	2
Microbiology (I & II)	1	3	0	1
Nutrition & Dietetics	3	0	0	1
Pathology/ Systematic Pathology	1	3	0	0
Psychology	4	1	0	0
Physiology (I &II)	1	3	0	1
Pharmacology	2	0	0	1
Community Medicine	2	2	0	0
Genetics	2	2	0	0
<b>TOTAL</b>	<b>34</b>	<b>19</b>	<b>0</b>	<b>15</b>

While Rwanda has many General Practitioners who can be hired, recaptured, or could serve as faculty, some will have to be sent abroad to gain the necessary qualifications.

To fulfill faculty requirements, Table 10.10.1.F indicates the pace at which faculty will be sent abroad. Wherever possible, study abroad is prioritized in earlier years to accelerate the development of Rwandan full-time faculty and progress toward achieving sustainability for educational programs.

Table 10.10.1.F: Total Study Abroad Needs | Undergraduate Medical Education (A0)

Subspecialty Program*	Training Years	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Anatomy (I, II & III)	2	0	1	0	0	0	0	0	0	0	0
Biochemistry	2	0	2	0	0	0	0	0	0	0	0
Clinical Chemistry (I & II)	2	0	3	0	0	0	0	0	0	0	0
Embryology & Histology	2	0	2	0	0	0	0	0	0	0	0
Immunology, Microbiology & Parasitology	2	0	1	0	0	0	0	0	0	0	0
Hematology	2	0	2	0	0	0	0	0	0	0	0
Microbiology (I & II)	2	0	1	0	0	0	0	0	0	0	0
Nutrition & Dietetics	2	0	1	0	0	0	0	0	0	0	0
Pathology/ Systematic Pathology	2	0	0	0	0	0	0	0	0	0	0
Psychology	2	0	0	0	0	0	0	0	0	0	0
Physiology (I & II)	2	0	1	0	0	0	0	0	0	0	0
Pharmacology	2	0	1	0	0	0	0	0	0	0	0
Community Medicine	2	0	0	0	0	0	0	0	0	0	0
Genetics	2	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<i>n/a</i>	<b>0</b>	<b>15</b>	<b>0</b>							

\*Figures in study abroad table refer to year the individual left to study abroad.

While Rwandan faculty are being hired and trained to fill the total program faculty requirements, visiting faculty will be required in the interim to fill gaps and ensure that the complete curriculum is delivered to enrolled trainees. Table 10.10.1.G indicates visiting faculty needs to fill gaps. Where possible, volunteer options—including from the Rwandan diaspora—will be exhausted before recruiting paid visiting faculty.

Table 10.10.1.G: Total Visiting Faculty Needs (FTE) | Undergraduate Medical Education (A0)

	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Total Program Enrollment	999	960	644	647	734	930	1014	1087	1136	1185
Anatomy (I, II & III)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biochemistry	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Clinical Chemistry (I & II)	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Embryology & Histology	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Immunology, Microbiology & Parasitology	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematology	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Microbiology (I & II)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nutrition & Dietetics	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pathology/ Systematic Pathology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Psychology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physiology (I & II)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pharmacology	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Community Medicine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Genetics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>TOTAL</b>	<b>10</b>	<b>10</b>	<b>7</b>	<b>0</b>						

### 10.10.2 Teaching Apprenticeship Program for Preclinical Faculty

To meet the required number of preclinical sciences faculty, a CMHS Teaching Apprenticeship Program will be developed<sup>9</sup> is proposed to identify and mentor the medical school's future preclinical faculty. During the 2021-22 academic year (January - December), visiting preclinical faculty will be placed at CMHS and expected to provide mentorship to two Rwandan teaching apprentices. Apprentices will be graduates from sciences programs at BSc level who have an interest in developing expertise and teaching in biomedical science fields. Visiting preclinical faculty will supervise and mentor Rwandan teaching apprentices in the classroom and will also support apprentices' applications to graduate programs on the continent in areas of preclinical specialties, such as pharmacology, biochemistry, cell biology, histology, etc. Apprentices accepted for training will then remain linked to visiting faculty for mentorship for research projects and after the completion of graduate training will return to CMHS and co-teach with visiting faculty for an additional year.

CMHS plans to conduct this program with two cohorts of 17 Teaching Apprentices (a total of 34 apprentices). Upon completion of the Teaching Apprentice program, Rwandan masters-level biomedical science faculty will be available to serve as preclinical faculty members at CMHS. The Teaching Apprentice Program provides a pipeline both for developing Rwandan preclinical faculty and also for phasing out visiting faculty over five years. Participants in the Teaching Apprentice Program will be asked to sign a binding contract that will require their service as CMHS preclinical faculty for a set period, in exchange for a funded masters-level education in preclinical sciences. Even with some attrition (due to causes such as withdrawal from graduate programs or relocation of former apprentices), CMHS will have a qualified pool of more than the minimum number of 17 preclinical, Rwandan faculty within a six-year

<sup>9</sup> For a potential models and considerations, see *Talbert-Slagle, Kristina, Developing Permanent Medical School Preclinical Sciences Faculty | Transitioning Visiting Faculty for Long-Term Sustainability. New Haven & Monrovia. 2016.*

timeframe. Additional available biomedical sciences Masters trained individuals will be available to teach other health professionals' programs within CMHS and made available in future years as CMHS expands its enrollment.

Study abroad opportunities for MSc and PhD programs will be made available to apprentices as well as current degree holders relevant to preclinical sciences for further training. While trainees are engaged in study abroad, visiting faculty will be recruited to fill immediate gaps in order to achieve scale up of quality and quantity of the medical school pipeline.

Infrastructure planning and investments are required early on in the program. Development of a campus infrastructure master plan is proposed in early 2020 to guide investments for the construction of additional classrooms, laboratories, faculty offices, student housing, library, recreational areas and expanded cafeteria. Four education centers major teaching hospitals (simulation labs, classrooms, on-site libraries, meeting space and faculty offices. While teaching apprentices will be studying abroad construction activities will take place in order to time returned study abroad graduates, opening of facilities and scale-up of enrollment.

#### **10.10.3 Infrastructure and Equipment Investments to Expand the Undergraduate Medical Education (AO) program**

CMHS infrastructure was built in 1978 for an anticipated maximum capacity of 40 students. Today, CMHS enrolls over 100 undergrad medical students per year. However, to meet Rwanda's aggressive goal to specialize 1608 physicians in the health workforce by 2030, CMHS has to more than double its current enrollment rates to more than 200 new enrollments per year by 2025. Without significant investment in infrastructure expansion and the immediate training and hiring of 17 faculty in the core curriculum, capacity limitations for undergraduate classes in pre-clinical sciences will be the central bottleneck to meet the public sector demand for physician related services

Interventions in infrastructure, faculty and equipment are needed urgently in early phases of the National Strategy for Health Professions Development in order to produce a sufficient number of general practitioners and allow for a high rate of specialization.

### 10.11 DEVELOPMENT OF IN-COUNTRY FELLOWSHIP PROGRAMS BY SUB-SPECIALTY

Rwanda has developed a core base of medical specialist faculty, accelerated by the HRH Program over the past seven years. Over 108 Internal Medicine, 86 Obstetricians & Gynecologists, 63 Pediatricians and 23 Emergency Medicine physicians graduated as of 2018. These programs are now well positioned to develop in-country sub-specialization programs (also known as fellowship programs) to develop high-quality services in areas such as Cardiology, Neurology, Neonatology and other areas.

In order to commence an in-country sub-specialty program, two sub-specialist faculty are needed who can serve as mentors for the duration of training (usually two to three years depending on research requirements). Due to the close nature of mentorship required programs will initially start with one to two enrollees who are graduates of medical specialist programs. One cohort will enroll at a time. Short rotations abroad will be organized to maximize clinical knowledge and provide trainees with a broad range of knowledge to create further innovations in Rwanda’s teaching hospitals.

To commence fellowship training, curricula for each of the targeted sub-specialty programs (see list below) will need to be developed. Specialized medical equipment is required for each program in order for mentors and trainees to provide service and train. Table 10.11.A highlights prioritized program areas.

Table 10.11.A: Specialty Program Sub-Specializations

Subspecialty Program	Specialty Area	Launch Academic Year
1. Maternal Fetal Medicine	Obstetrics & Gynecology	2022/23
2. Gynecology Oncology	Obstetrics & Gynecology	2022/23
3. Neonatology	Pediatrics	2022/23
4. Pediatric Cardiology	Pediatrics	2022/23
5. Pediatric Emergency Medicine	Emergency Medicine	2024/25
6. Pediatric Anesthesia	Anesthesiology	2024/25
7. Neurology	Internal Medicine	2025/26
8. Endocrinology	Internal Medicine	2022/23
9. Nephrology	Internal Medicine	2023/24
10. Cardiology	Internal Medicine	2023/24

For each program, an academic partner will be engaged to provide visiting faculty for an initial two years to develop program standards, curricula and advise on service-delivery organization at teaching hospitals to start and expand services. Academic partners will also provide research mentorship throughout the life of each sub-specialty fellowship program.

## 10.12 CROSS-CUTTING: TRAINING SPONSORSHIP

To achieve scaled production of prioritized health workforce cadres, interventions must address not only the capacity of University of Rwanda to provide training but also demand for that training. To that end and to ensure that there is adequate demand for enrollment slots, MOH and MINEDUC will collaborate to ensure that training sponsorship is considered and distributed to prioritized cadres across disciplines and specializations as needed with consideration for equity across programs. This is a continuation of a policy under the Rwanda HRH Program (2012 – 2019).

## 10.13 EQUIPMENT AND INFRASTRUCTURE

The NSHPD calls for major increase in training capacity of existing and new training sites. Major equipment and infrastructure investments have been planned across thirty-three academic programs involving teaching, referral, provincial and district hospitals. In order to expand clinical teaching capacity at hospitals existing teaching hospitals will be strengthened while additional teaching sites at provincial and district level will be upgraded to accommodate select training programs (see summary Table 10.1310.10.3.A below and 14.2.A/B. in Appendix 14 for a detailed list). Additional infrastructure and equipment investments are planned at University of Rwanda’s School of Medicine to accommodate expansion as the precursor to all medical education interventions laid forth in this strategy.

Table 10.1310.10.3.A Proposed Upgrades for Select Teaching Sites

Hospital Level	Site Name	Proposed Upgrade(s)
Teaching Hospitals	CHUB, CHUK, KFH, KMH, Ndera	Immediately develop education centers, simulation labs, libraries, trainee education spaces. Procure required equipment.
Referral Hospitals	Kibungo, Kibuye, Ruhengeri	Over the next five years, upgrade to Teaching Hospitals according to national standards.
Provincial Hospitals	Bushenge, Kinyihira, Ruhango, Rwamagana	Over several years upgrade to teaching sites for selected training programs.
District Hospital	All	Over three to five years, upgrade sites against standards for Nursing, Midwifery, and Undergraduate Medical Education.
Health Centers	TBD	Over three to five years upgrade to teaching sites against standards for Nursing and Midwifery programs.

Heads of training programs and facilities were consulted to inform key lists of equipment and infrastructure needed to expand existing clinical services and prepare for new services (e.g. gynecologic oncology, pediatric cardiology, etc.) aimed to commence during the ten-year program period. Consideration has been given to expansion of clinical rotation sites of trainees to extend the reach of training programs to additional facilities.

Planning for infrastructure and equipment needs considered the East Africa Community’s *Regional Guidelines for Inspection and Recognition of Medical and Teaching Hospitals in EAC Partner States* as well as requirements outlined in similar clinical training programs in other countries.

At the four major teaching hospitals, the development of full education centers is planned for which will include classrooms, simulation labs, lecture halls, libraries, student common space, resource centers and faculty offices to ensure that teaching hospitals are provided with the necessary facilities to host educational activities. The establishment of education centers will allow each teaching hospital to meet benchmark requirements for accreditation. Facilities will be shared across programs.

The Rwandan health sector is still facing challenges of insufficient medical equipment in health facilities as well as their management. There are too few Medical Engineers and Technicians in Rwanda to deal with maintenance and management of all medical and hospital equipment, which includes electrical, civil, mechanical works and plants. In order to provide excellent healthcare, the health sector requires highly skilled biomedical engineers and technician to manage and maintain health sector equipment. These challenges are not unique to Rwanda, and neighboring countries would similarly benefit from high-quality training opportunities. To this end, the Government of Rwanda is establishing the East Africa Centre of Excellence for Biomedical Engineering and e-Health (CEBE). The CEBE seeks to offer professional trainings and three-master's programs in Biomedical Engineering, e-Health and in Rehabilitation and Mobility Sciences in the East African Region. The CEBE is expected to launch in 2021 and Rwanda Polytechnique (RP) recently started to train biomedical technicians. Nevertheless, the Rwandan health sector is still facing the challenge of biomedical engineering related services. The HRH secretariat will carry out a comprehensive analysis to determine the full scope of needs in terms of biomedical engineers at all levels. The majority of the CEBE project is currently funded by the African Development Bank with partial gaps for laboratory equipment, construction and supervision and start-up costs indicated in the NSHPD.

# 11 IMPLEMENTATION STRATEGIES – PROFESSIONALISM AND QUALITY OF CARE

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In addition to strengthening the scale and quality of pre-service training, this strategy proposes measures to ensure that health professionals receive high quality training and are prepared and supported to provide services that ensure the highest quality of care possible and in line with principles of professionalism. Multi-level interventions will address professionalism and quality across the lifecycle of a health worker: from pre-service selection through training to deployment.

## 11.1 PRE-SERVICE SELECTION

Currently, candidates are selected into health professions training in Rwanda based primarily on their performance on quantitative exams. There is a growing push to use qualitative interviews to select health professionals who not only demonstrate the academic aptitude for the profession but also possess qualities that are later associated with positive behaviors during deployment, including professionalism and retention in public sector positions.

The HRH secretariat will work with all relevant stakeholders to review and introduce a new selection process of candidates for all existing and upcoming public and private health professional training programs. The selection will focus on the attributes necessary to succeed as health care worker, rather than technical skills alone. Selection tools will be developed by an academic body that includes professionals from within the program, psychometric specialist and other relevant experts in the matter. The tools will be used during the identification and preselection stage. The HRH Secretariat and relevant health professionals will play a contributing role in the development of balanced selection mechanisms and to ensure these are implemented, evaluated and adjusted over the course of the 10 years. In addition, the Secretariat will support the University of Rwanda to develop materials and implement activities such as open days to orient and attract future health professional students.

## 11.2 EDUCATION

In order to enhance and promote professionalism in the health workforce, there must be an expectation, encouragement, and evaluation. Strategies are proposed below to improve professionalism and quality of care:

- A. Incorporate as part of the accreditation of each program a mentorship program where trained faculty are paired with students for the duration of their pre-service education to help guide the students in their career development and enforce soft skills required to provide high quality care.
- B. Enhance effective implementation of a mentorship program as part of the accreditation process of health professions training programs across all disciplines.
- C. Enforce mandatory training on professionalism, stress management, and competencies and skills that are essentials for students to acquire such as emotional intelligence, communication skills, listening skills, collaboration, civility, kindness, empathy, respect, trustworthiness, motivation, problem-solving skills, time management skills, the ability to work under pressure, leadership skills, teaching skills. Integrate formative and certificate assessment of student's professionalism and of these competencies as a requirement for graduation. Incorporating evaluation of professionalism and these soft skills that are essential to the providing high quality care and that should be learned and practiced like any other skills and integrated as a requirement for graduation.

- D. High quality education is primarily guaranteed by high quality of training staff.
  - A. Develop and provide program to improve the quality of teaching and the learning experience of students in all disciplines.
  - B. Develop and provide professionalism courses and ToT for professors and supervisors.
  - C. Incorporate expectation for professionalism for faculty and clinical supervisors as a requirement for contracting and promotion and implementing mechanism at each program and department level to measure and improve professionalism
  
- E. Professionalism includes the commitment to improving quality of care.
  - A. Integrate elements of quality improvement in each training program. Incorporate expectation for contribution to quality improvement projects not only for learners but also for faculty and clinical supervisors a requirement for contracting and promotion.
  - B. Implementing mechanism at each program and department level to measure and improve the ability to lead effective quality improvement projects
  
- F. Professionalism also includes a commitment to scientific knowledge.
  - A. Healthcare professionals will be expected to support the appropriate use and development of new scientific knowledge and perform research according to principles of ethics and professionalism.
  - B. ability to use organized evidence in everyday decision making will be taught and monitored for each level for learner and faculty at each department level.

### 11.3 QUALITY OVERSIGHT OF PRACTICING HEALTH PROFESSIONALS

To effectively institutionalize quality control, efforts will be divided into two management tiers: national level and facility level. The national level policy recommendations will be carried out by the Ministry of Health with proposed advisory role on professionalism and quality from health professional councils. Teaching Institutions and health facilities will carry out the implementation; the facility level recommendations will be led by a quality control committee established at each facility.

#### 11.3.1 National Level

To streamline quality oversight of health professionals, the Ministry of Health will work with health professional councils and necessary regulatory bodies to:

- Develop and endorse all guiding documents (Code of Ethics, Code of Conduct, Malpractice guidelines, Standard Operating Procedures) related to health professions behaviors and quality of care
- Ensure standards, monitoring activities, and responsive actions are integrated with MOH through routine platforms such as Integrated Supportive Supervision
- Articulate standards of professional practice and attitude, proposing sanctions if these practices are not met, and standardizing financial (or non-financial) recognition for excellence to incentivize positive behaviors
- Ensure health worker are licensed, re-licensed incorporating continuous professional development (CPD) schemes, and ensuring that aspects of professionalism are integrated into criteria for advancement

Immediate activities will include:

- Develop trainings on professionalisms and quality of care for all providers for dissemination through facility committees.
- Develop a pocketbook containing Code of Conduct and other key documents for all facility-based staff.

### 11.3.2 Facility Level

Currently, each facility has a Disciplinary Committee that is responsible for addressing violations of the Code of Conduct and other guidelines around health professions behavior. While sanctions are important, it is important for each institution and facility to also have mechanism to set expectations, measure performance and ensure positive re-enforcement mechanisms are implemented so that there is constant encouragement of positive behavior in addition to sanctions for negative behaviour. It is proposed to establish Professionalism and Quality Committees.

The facility level Professionalism and Quality Committee will be responsible for ensuring compliance with guiding documents (CoE, CoC, Malpractice guidelines, SOPs) and for implementing trainings and other activities to enforce positive behavior as well as propose sanction for negative behavior. The committee will implement interventions to create culture of professionalism and patient safety. The committee will put in place mechanism to measure all aspects of quality of care at each department.

The terms of reference and structure of the Professionalism and Quality Committee will be defined during early implementation of the strategy. The Committee will undertake activities such as convening for monthly meetings with supervisors to review complaints, implementing proactive process improvements, acknowledging high performing staff, and reinforcing stress management and soft skill training. Committee leaders will manage the delivery of soft skills training and refresher training on guiding documents. The committee will also be responsible for reviewing and addressing patient complaints and community feedback through the “Patient Voice” program, patients exit interviews, scorecards, and other citizen engagement mechanisms to be determined. These mechanisms for communication with patients foster a feedback loop to ensure quality care is being provided and upheld by healthcare providers across health facility levels and geographies. Partnerships with civil society organizations and other stakeholders will be nurtured to encourage innovative ways of fostering quality of care and professional at facility level, and enforcement of accountability mechanisms

Lastly, the Professionalism and Quality Committee will be responsible for managing the mentorship program (including implementing clear TOR for mentors and mentees, evaluating the efficiency of the mentorship and providing remediation measures when necessary to improve the quality of the mentorship) by which newly deployed health workers are paired with senior mentors. This will support seamless on boarding and continuity between health workers to ensure policy and standard alignment.

## 12 PROGRAM MANAGEMENT AND GOVERNANCE

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### 12.1 PROGRAM MANAGEMENT: HUMAN RESOURCES FOR HEALTH SECRETARIAT

A Human Resources for Health Secretariat will manage this bold and broad initiative. The Secretariat will commence with 15 full time staffs to ensure coverage of key functions related to health professional development.

The Human Resource for Health Secretariat has the following core responsibilities in addition to those outlined in this strategy document:

1. to oversee the health professional education and training in public and private institutions to ensure the quality of health professional training;
2. to build the capacity of higher learning public institutions providing health professional education and clinical teaching sites in order to sustain high quality education;
3. to advocate for adequate infrastructure and equipment for quality health professional education;
4. to coordinate faculty recruitment and management;
5. to put in place strategies to attract student's enrollment in health profession education;
6. to coordinate the teaching sites expansion;
7. to coordinate academic partnership in health sector at national, regional and international level;
8. to provide support in teaching hospital reforms;
9. to ensure the quality of health professional teaching;
10. to provide support in improvement of health professional skills through continuous professional development programs in the public and private health sectors;
11. to support training and sustain the role of health managers into the public sector health system.

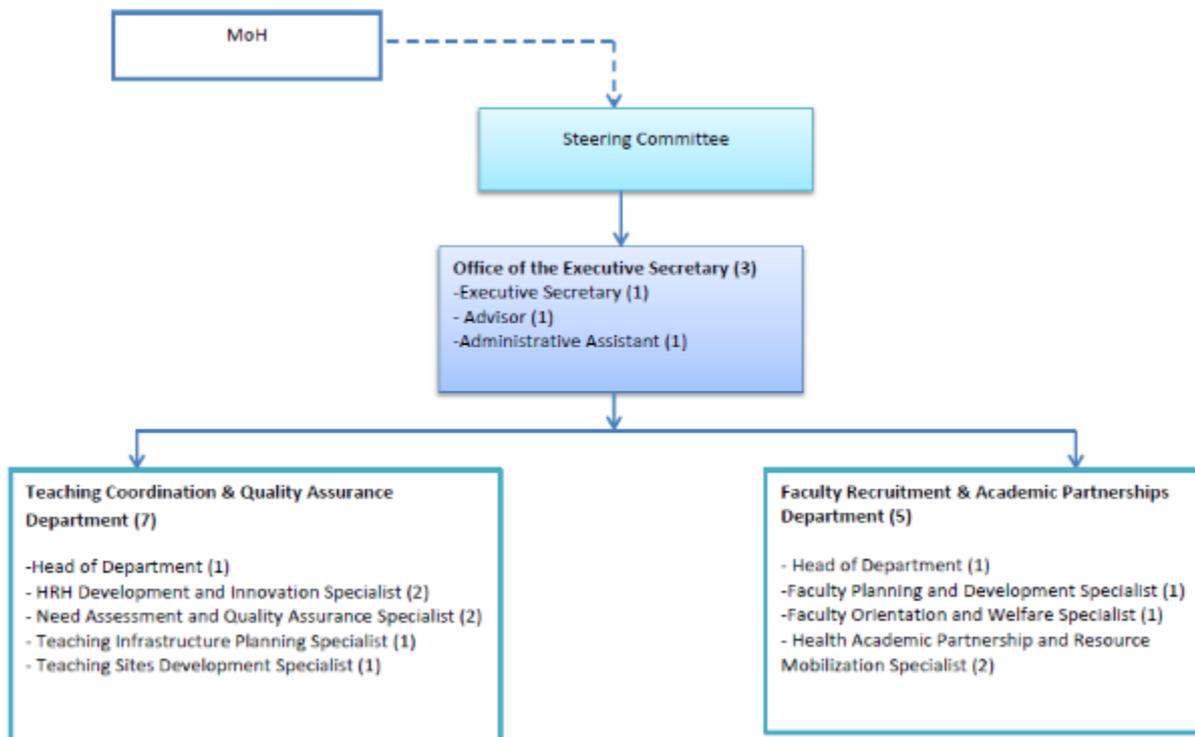
#### **Teaching Coordination & Quality Assurance Department**

The Teaching Coordination & Quality Assurance Department will oversee teaching quality in all programs in coordinating broader initiatives to strengthen professionalism and quality of care provided by health workers; oversee and support management of the undergraduate and postgraduate programs for public and private health professional teaching; coordinate the overall strategic management for the development, monitoring and evaluation for health professionals; Ensure quality research, research based education and exchange programs; coordinate the effort of public and private health professional education institutions;

#### **Faculty Recruitment & Academic Partnerships Department**

The Faculty Recruitment & Academic Partnerships Department is responsible for faculty recapture, faculty development (hiring and talent retention), and partnership management. The department will coordinate the implementation of interventions related to faculty recruitment and academic partnerships; coordinate faculty recapture and local expertise engagement in academia and research as well as faculty development; coordinate both existing and new academic partnership, coordinate stakeholder inputs and contributions; mobilize funds necessary for the implementation of these strategies; coordinate all activities related to orientation and welfare of local, visiting, volunteers and diaspora faculty.

Figure 11.3.2.1: Human Resources for Health Secretariat



## 12.2 GOVERNANCE

### 12.2.1 Governance

The Human Resource for Health Secretariat fulfils its responsibilities under the supervision of the Ministry of Health. The Office of the Executive Secretary will directly report to a Steering Committee to ensure necessary coordination across sectors and key institutions.

## 12.3 MONITORING & EVALUATION

The HRH Secretariat will lead monitoring and evaluation efforts of the strategy. Routine monitoring will track primarily quantitative output and outcome indicators, while mixed-methods methods and qualitative studies will be employed to examine outcomes related to quality of training and quality and organization of care in teaching sites.

In addition to annual program reviews, a comprehensive mid-term review is proposed to not only assess progress toward targets but to examine whether the program is moving toward the *right* targets—a necessary step for a long-term health systems strengthening initiative that takes place in a dynamic service delivery environment with changing population needs. A series of applied studies—including a workforce optimization analysis and health labor market analysis—is proposed in advance of the mid-term review so that the review may examine and revise as necessary programmatic targets based on an assessment of service provision goals and health system demand.

### 12.3.1 Routine monitoring

Twice annual data collection and verification will be conducted against primarily output and process indicators. Indicators that are collected will be analyzed in advance of the annual review, so that results may be reviewed and course correction applied ahead of each budgeting cycle and program planning cycle.

Table 12.3.11.A: Routine Monitoring

Result	Indicator	Frequency	Target/Analysis	Means of verification
<b>Outcomes</b>	Doctor (GP and specialist) to population ratio	Annual	1/7,000 by 2024 (HSSPIV) Target to be set for 2030 during mid-term review	HMIS – MOH Annual Report; RHPC information system (proposed)
	Midwife to population ratio (women aged 15-49)	Annual	1/2,500 by 2024 (HSSPIV) Target to be set for 2030 during mid-term review	HMIS – MOH Annual Report; RHPC information system (proposed)
	Lab technicians to population ratio	Annual	1/7,500 by 2024 (HSSPIV) Target to be set for 2030 during mid-term review	HMIS – MOH Annual Report; RHPC information system (proposed)
	No. of providers in the public sector for targeted categories of provider	Annual	Analyze against expected public sector workforce growth from pipeline	HMIS – MOH Annual Report; RHPC information system (proposed)
<b>Outputs</b>	No. of graduates from targeted academic programs	Annual	Analyze against expected graduation targets from pipeline	HMIS – MOH Annual Report; CMHS registrar; RHPC information system (proposed)
	No. of Rwandan faculty with required qualifications	Twice annual	Analyze against total requirements and expected faculty growth per strategy	CMHS records
<b>Process</b>	No. of first year enrollees in targeted academic programs	Twice annual	Analyze against first year enrollment targets from pipeline	CMHS registrar; RHPC information system
	No. of faculty sent abroad for advanced qualifications	Twice annual	Analyze against plans indicated in strategy document	PMU documentation
	Visiting faculty FTEs recruited	Twice annual	Analyze against planned visiting faculty FTEs by school and program	PMU documentation

### 12.3.2 Evaluation

Evaluation for this large and complex program will take several forms:

- The **baseline, midline and endline evaluations** will be mixed methods. In addition to collecting and verifying quantitative data related to key output and outcome indicators (numbers of trainees and workforce), these studies will focus on quality of training in the targeted academic programs within scope. Quality will be assessed through primarily qualitative measures with an emphasis on structure and process. The baseline evaluation will be conducted in 2020; data collection for the midline shall commence in 2024 to prepare for the midterm review in 2025; and the endline evaluation is planned for 2030.
- **Evaluation of teaching hospital reform:** Included in the program strategy is a complex systems intervention to reform teaching hospital governance and management. Examining the impact of this reform will require a dedicated study with fit-for-purpose methods. The study will be embedded in the baseline and midline evaluations, but will employ an implementation research lens, examining the contextual and organizational factors influencing the organization and quality of care and training in teaching hospitals. The study will examine quantitative measures such as wait times and infection rates; it will also qualitatively examine cross department referral, integration of clinical and academic functions, etc.
- **Process evaluation:** The strategy proposes several process innovations as compared to its predecessor program, including a revised program management and governance scheme and a novel approach to seeking and remunerating visiting faculty. To ensure that these process innovations serve the overall goals of the program and that design assumptions are upheld, a mixed methods process evaluation will be conducted in 2022. The results of the process evaluation should be used to adjust implementation strategies and mechanisms as required. Process evaluation questions will also be embedded in the midline evaluation planned for 2024.
- **Micro-evaluation fund:** A program as large as the NSHPD runs the risk of assessing and reporting only aggregate level results, without diving into the results that are emerging in each of the program's many components. To address this challenge while also building the capacity of CMHS faculty and other program participants, the strategy will provide for a pot of applied research funding for research that explores results of program activities—increased hiring of Rwandan faculty, increased qualifications of Rwandan faculty, teaching hospital reform, and infrastructure and equipment upgrades—on the quality of teaching, access to care and clinical outcomes. This funding could be accessed by Rwandan faculty and their academic partners to examine specific changes occurring within their domains, such as nursing education or specific postgraduate training programs.

### 12.3.3 Reviews and learning

#### 12.3.3.1 Annual Reviews

Reviews will be conducted each year. The purpose of the reviews will be to analyze primarily quantitative data associated with process and output indicators, including number of trainees, number of graduates, numbers of faculty sent abroad, and numbers (FTEs) of visiting faculty procured. All of these measures will be evaluated against the targets outlined in this proposal, which indicate the numbers required to reach program objectives, so that progress against the strategy can be assessed and mitigation or course correction measures implemented as required.

Reviews will be organized by the Human Resources for Health Secretariat and attended by the Steering Committee, who are empowered to provide strategic direction to the Human Resources for Health Secretariat. Course corrective actions identified in the annual reviews shall be incorporated into annual operational planning and budgeting.

#### 12.3.3.2 Mid-term review

A mid-term review shall be conducted in 2025. The mid-term review will present the results of the midline evaluation (described above) and additionally shall answer such questions as:

Table 12.3.33.A: Mid-term Review

Question	Source/Analysis
<b>Are the workforce targets set by the program appropriate? Do they need to be revised to reflect evolving service provision goals, service demand or absorption capacity?</b>	<ul style="list-style-type: none"> <li>- Rwanda Specialty and Sub-specialty Services Road Map (2022)</li> <li>- Health workforce optimization analysis (2023)</li> <li>- Health labor market analysis (2024)</li> <li>- Analysis of forecasted specialist and sub-specialist workforce targets as share of total doctors</li> </ul>
<b>Are program processes and structures effect in achieving program objectives?</b>	<ul style="list-style-type: none"> <li>- Qualitative interviews with key stakeholders</li> <li>- Examination of procurement and infrastructure processes and records</li> <li>- Examination of processes and records related to academic partnership and visiting faculty recruitment and deployment</li> <li>- Examination of processes and records related to development of Rwandan faculty, including study abroad</li> </ul>

### 12.3.3.3 Applied studies

In order to achieve the objectives outlined in the mid-term review, a series of applied studies will be conducted to provide the information required for reflection on programmatic targets:

- A **Specialty and Sub-specialty Services Road Map** (see Section 8.4) will be developed in 2022 outlining the MOH’s vision for conferral of services across all levels. The Road Map will indicate the types of providers required at each level to provide the indicated services.
- Based on the road map, workforce requirements will be analyzed using a **Workload Indicators of Staffing Need (WISN) analysis** to be conducted in 2023. The results of the analysis will indicate workforce requirements for all types of providers within scope at all relevant facility levels.
- In 2024, a **health labor market analysis** will be conducted to ensure that Rwanda has the fiscal space required to absorb the workforce requirements indicated in the workforce optimization analysis.

The results of these analyses will together inform an examination of what the program’s targets workforce targets should be through 2030.

### 12.3.4 Information system strengthening

To track program results and also to strengthen availability of quality of data for routine planning and management, stronger health workforce information systems are required. Specifically, an information system will be developed to link health professionals from the point of entry into pre-service training through deployment.

Health professions councils will manage and monitor licensure and re-licensure of health professions in Rwanda, which in turn will requires comprehensive databases of practicing health professionals and their licensure. The database will be extended to the point of entry into pre-service training (i.e. not just in-service professionals) so that councils may monitor the pipeline and collaborate with the HRH Secretariat to plan and manage the pre-service pipeline. This data source will be critical for tracking the contribution of the program to growth in the public sector workforce.

## 13 PROGRAM COSTS

Investment costs are organized into four thematic areas—policy actions to implement teaching hospital reform; faculty recapture and job levels harmonization; the expansion of teaching sites; and interventions to address professionalism and quality—as well as investments by academic program for each of the 37 academic programs plus 10 new sub-specialty fellowship programs. Interventions by academic program include targeted infrastructure and equipment investments by service delivery cluster and program; and study abroad, visiting faculty and academic partnerships to develop Rwandan faculty and ensure immediate high quality of training as institutional capacity is built. Equipment is the biggest driver of costs by academic program, followed by visiting faculty and infrastructure.

Table 13.A Total Program Investment Costs

INVESTMENT COSTS	Feb 2020 - June 2030
	Grand Total Cost (USD)
Program Governance and Teaching Hospital Reform	\$2,448,675
Faculty Recapture & Job Levels Harmonization	\$5,000
Teaching Site Improvement and Expansion	\$37,036,624
Professionalism, Attitude and Quality of Care	\$11,646,667
M & E	\$4,805,980
Interventions by Program - Faculty	\$101,243,222
Interventions by Program - Equipment	\$48,298,456
Interventions by Program - Infrastructure	\$41,312,839
Academic Partnerships, Fellowships, Other Academic Programs	\$27,158,275
<b>Total</b>	<b>\$273,955,738</b>

Full estimated strategy costing details are available from the HRH Secretariat upon request.

Investment costs for the program are summarized in Table 13.A above. Investments across the ten-year strategy timeframe are significantly frontloaded, with 90% of costs occurring in the first five years of the program. Approximately 46% of total investment costs are for infrastructure and equipment, including expanding and upgrading teaching sites to enable high quality training.

In the strategy, total costs to realize program strategies have been provided, agnostic to potential budget source; some of these costs may be covered by ongoing or planned investments by the Government of Rwanda, such as improvements to teaching hospitals or other budget commitments, with complementary investments from other sources. At present the Government of Rwanda contributes roughly USD 12M to health sector infrastructure, and this is expected to grow 10% per year. At this rate, over the ten-year strategy period the government may expect to contribute over USD 31M to infrastructure investments which may be shaped against the needs defined in this strategy.

A total of 476 visiting faculty full time equivalents (FTEs) are estimated as needed across the 37 academic programs over ten years. Visiting faculty will fill gaps while Rwanda faculty are sent abroad in large numbers to gain the advanced qualifications that they need to deliver high quality training programs. The strategy prioritizes recruiting volunteers to fill these positions.

To sustain the program and its results, estimated Government of Rwanda costs include costs to remunerate the expanded workforce, more than double current faculty numbers for targeted programs, and cover salary for all public sector trainees.

Currently the MOH total wage bill is estimated at USD 50M with an expectation of 10% growth each year; at this rate the total 2030 wage bill is forecasted to reach about USD 129M by 2030. The costing exercise has indicated that the associated wage bill growth is within a reasonable share of the overall forecasted wage bill. The M&E plan for the program proposes that a health labor market analysis be conducted ahead of the mid-term review to ensure that targets are assessed and potentially revised in view of financial feasibility.

Full estimated strategy costing details are available from the HRH Secretariat upon request.

## 14 APPENDIX/FIGURES/TABLES

### 14.1 APPENDIX: HEALTH WORKFORCE TARGETS BY FACILITY LEVEL AND ASSOCIATED ACADEMIC PROGRAM

#### 14.1.1 Workforce Targets

Table 14.1.1.A. Workforce Targets by Facility Level and Associated Academic Program

	Health Center	District Hospital	Provincial Hospital	Referral Hospital	Teaching Hospital
<b>Women and Children's Health</b>					
Midwifery (A0)	540	200	40	90	160
Midwifery (A1)	1415	1000	76	30	100
Master of Midwifery	0	0	4	15	20
Master of Nursing: Pediatrics	0	80	8	45	40
Master of Nursing: Neonatal	0	80	8	30	40
Physician: Obstetrics & Gynecology	0	160	16	30	64
Physician: Pediatrics	0	120	12	27	80
<b>Medicine and Non-Communicable Diseases</b>					
Master of Nursing: Nephrology	0	0	0	6	32
Master of Nursing: Oncology	0	40	8	12	24
Physician: Internal Medicine	0	80	24	18	64
<b>Emergency Medicine</b>					
Master of Nursing: Critical Care/Trauma	0	160	40	36	100
Physician: Emergency Medicine	0	0	8	18	48
<b>Surgery/Anesthesia</b>					
Non-Physician Anesthetist (A0)	0	320	40	36	160
Master of Nursing: Medical Surgical	0	160	32	30	80
Master of Nursing: Perioperative	0	120	24	30	80
Physician: Anesthesiology	0	80	16	18	92
Physician: Otorhinolaryngology (ENT)	0	80	8	12	24
Physician: Surgery-General	0	80	16	12	32
Physician: Surgery-Neuro	0	0	0	6	24
Physician: Surgery-Orthopedic	0	0	8	12	40

	Health Center	District Hospital	Provincial Hospital	Referral Hospital	Teaching Hospital
Physician: Surgery-Urology	0	0	8	6	112
Mental Health					
Physician: Psychiatry	0	0	8	12	24
Diagnostics and Support Services					
Biomedical Laboratory Scientist (A0)	0	600	52	54	120
Physician: Pathology	0	0	8	6	40
Physician: Radiology	0	0	8	6	40
Oral Health					
Dental Therapist (A0)	1080	160	4	0	0
Dental Surgeon (A0)	0	80	8	12	24
Sensory Services					
Audiologist (A0)	0	80	12	9	20
Speech Therapist (A0)	0	80	12	9	20
Physician: Ophthalmology	0	0	8	12	24
Leadership and Management					
Nurse: Education, Leadership, and Management	0	40	4	3	32
Master of Hospital and Healthcare Administration	0	80	8	12	72
Undergraduate Medical Education					
Undergraduate Medical Education	0	880	56	42	40

Table 14.1.1.B: Workforce Target Norms by Facility Level and Associated Academic Program

	Health Center	District Hospital	Provincial Hospital	Referral Hospital	Teaching Hospital
<b>Women and Children's Health</b>					
Midwifery (A0)	1	5	10	30	40
Midwifery (A1)	3	25	19	10	25
Master of Midwifery	0	0	1	5	5
Master of Nursing: Pediatrics	0	2	2	15	10
Master of Nursing: Neonatal	0	2	2	10	10
Physician: Obstetrics & Gynecology	0	4	4	10	16
Physician: Pediatrics	0	3	3	9	20
<b>Medicine and Non-Communicable Diseases</b>					
Master of Nursing: Nephrology	0	0	0	2	8
Master of Nursing: Oncology	0	1	2	4	6
Physician: Internal Medicine	0	2	6	6	16
<b>Emergency Medicine</b>					
Master of Nursing: Critical Care/Trauma	0	4	10	12	25
Physician: Emergency Medicine	0	0	2	6	12
<b>Surgery/Anesthesia</b>					
Non-Physician Anesthetist (A0)	0	8	10	12	40
Master of Nursing: Medical Surgical	0	4	8	10	20
Master of Nursing: Perioperative	0	3	6	10	20
Physician: Anesthesiology	0	2	4	6	12
Physician: Otorhinolaryngology (ENT)	0	2	2	4	6
Physician: Surgery-General	0	2	4	4	8
Physician: Surgery-Neuro	0	0	0	2	6
Physician: Surgery-Orthopedic	0	0	2	4	10
Physician: Surgery-Urology	0	0	2	2	6
<b>Mental Health</b>					
Physician: Psychiatry		0	2	4	6
<b>Diagnostics and Support Services</b>					

	Health Center	District Hospital	Provincial Hospital	Referral Hospital	Teaching Hospital
Biomedical Laboratory Scientist (A0)	0	15	13	18	30
Physician: Pathology	0	0	2	2	10
Physician: Radiology	0	0	2	2	10
Oral Health					
Dental Therapist (A0)	2	4	1	0	0
Dental Surgeon (A0)	0	2	2	4	6
Sensory Services					
Audiologist (A0)	0	2	3	3	5
Speech Therapist (A0)	0	2	3	3	5
Physician: Ophthalmology	0	0	2	4	6
Leadership and Management					
Nurse: Education, Leadership, and Management	0	1	1	1	8
Master of Hospital and Healthcare Administration	0	2	2	4	18
Undergraduate Medical Education					
Undergraduate Medical Education	0	22	14	14	10

## 14.2 APPENDIX: TEACHING SITE EXPANSION INFRASTRUCTURE AND EQUIPMENT

### 14.2.1 Teaching Site Expansion

Major equipment and infrastructure investments have been planned across thirty-three academic programs involving teaching, referral, provincial and district hospitals. In order to expand clinical teaching capacity at hospitals existing teaching hospitals will be strengthened while additional teaching sites at provincial and district level will be upgraded to accommodate select training programs.

Teaching sites will be upgraded according to infrastructure and equipment national and regional (Regional Guidelines for Inspection and Recognition of Medical and Teaching Hospitals in EAC Partner States) standards.

Table 14.2.1.A. Summary of Teaching Sites Proposed Upgrades

Hospital Level	Site Name	Proposed Upgrade(s)
Teaching Hospitals	CHUB, CHUK, KFH, KMH, Ndera	Immediately develop education centers, simulation labs, libraries, trainee education spaces. Procure required equipment.
Referral Hospitals	Kibungo, Kibuye, Ruhengeri	Over the next five years, upgrade to Teaching Hospitals according to national standards.
Provincial Hospitals	Bushenge, Kinyihira, Ruhango, Rwamagana	Over several years upgrade to teaching sites for select training programs.
District Hospital	All	Over three to five years, upgrade sites against standards for Nursing, Midwifery, and Undergraduate Medical Education.
Health Centers	TBD	Over three to five years upgrade to teaching sites against standards for Nursing and Midwifery programs.

Table 14.2.1.B. Detailed List of Sites Proposed for Upgrades

Province	District	Hospital Name	Type of Hospital
East	Bugesera	Nyamata	District Hospital
East	Gatsibo	Kiziguro	District Hospital
East	Gatsibo	Ngarama	District Hospital
East	Kayonza	Gahini	District Hospital
East	Kayonza	Rwinkwavu	District Hospital
East	Kirehe	Kirehe	District Hospital
East	Nyagatare	Nyagatare	District Hospital
Kigali City	Gasabo	Kibagabaga	District Hospital
Kigali City	Kicukiro	Masaka	District Hospital
Kigali City	Nyarugenge	Muhima	District Hospital
North	Burera	Butaro	District Hospital
North	Gakenke	Nemba	District Hospital
North	Gakenke	Ruli	District Hospital
North	Gicumbi	Byumba	District Hospital
North	Rulindo	Rutongo	District Hospital
South	Gisagara	Kibilizi	District Hospital

Province	District	Hospital Name	Type of Hospital
South	Gisagara	Gakoma	District Hospital
South	Huye	Kabutare	District Hospital
South	Kamonyi	Remera Rukoma	District Hospital
South	Muhanga	Kabgayi	District Hospital
South	Nyamagabe	Kigeme	District Hospital
South	Nyamagabe	Kaduha	District Hospital
South	Nyanza	Nyanza	District Hospital
South	Nyaruguru	Munini	District Hospital
South	Ruhango	Gitwe	District Hospital
West	Karongi	Mugonero	District Hospital
West	Karongi	Kirinda	District Hospital
West	Ngororero	Kabaya	District Hospital
West	Ngororero	Muhororo	District Hospital
West	Nyabihu	Shyira	District Hospital
West	Nyamasheke	Kibogora	District Hospital
West	Rubavu	Gisenyi	District Hospital
West	Rusizi	Mibilizi	District Hospital
West	Rusizi	Gihundwe	District Hospital
West	Rutsiro	Murunda	District Hospital
East	Rwamagana	Rwamagana	Provincial Hospital
North	Rulindo	Kinihira	Provincial Hospital
South	Ruhango	Ruhango	Provincial Hospital
West	Nyamasheke	Bushenge	Provincial Hospital
East	Ngoma	Kibungo	Referral Hospital
Kigali City	Gasabo	Kacyiru Police Hospital	Reference Hospital
Kigali City	Gasabo	King Faisal Hospital	Teaching Hospital
Kigali City	Gasabo	Caraes Ndera	Teaching Hospital
Kigali City	Kicukiro	Rwanda Military Hospital/Kanombe	Teaching Hospital
Kigali City	Nyarugenge	Chk/Chuk	Teaching Hospital
Norh	Musanze	Ruhengeri	Referral Hospital
South	Huye	Butare Chu	Teaching Hospital
West	Karongi	Kibuye	Referral Hospital

# 14.3 APPENDIX: SAMPLE ENROLLMENT, GRADUATION, AND WORKFORCE PIPELINE TOOL

## KEY

Input
Calculation
Output
Data

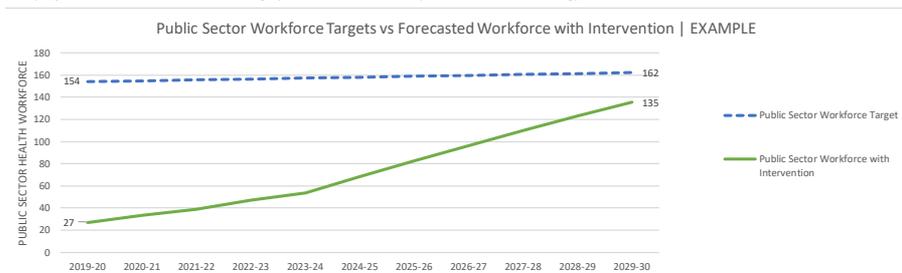
## ASSUMPTIONS

4	Training Duration
90%	Graduation Rate (%)
90%	Percent of Graduates Entering Public Workforce
10%	Other (private sector, leave WF, etc.)
27	Current Workforce Number (Jan 2020)
3%	Workforce Attrition for Newly Trained Specialists (Aggregated)
10	What is the current first year new student intake/enrollment capacity given current post-HRH faculty availability?
20	What is the maximum first year new student intake/enrollment capacity if all required faculty for the program are available?

## PUBLIC SECTOR HEALTH WORKFORCE FACILITY STAFFING NORMS AND AGGREGATE TARGETS

Facility Level	Facility Staffing Norms					2019 No. Facilities	2030 No. Facilities
	Gazette 2016	WISN 2019	NSOAP 2019	MOH Target Norm	Production-Adjusted Norm 2020		
Health Center	n/a	n/a	n/a	0	0.0	504	540
District Hospital	6*	n/a	1	2	0.4	36	40
Provincial Hospital	10*	n/a	1	4	0.7	3.3	4
Referral Hospital	11*	n/a	1	6	1.1	5.0	3
Teaching Hospital	n/a	n/a	n/a	12	2.1	10.0	4

\*Unspecified distribution between General Surgery, Internal Medicine, Ob-Gyn, Pediatrics, Anesthesiology



## ENROLLMENT, GRADUATION, FACULTY, AND WORKFORCE PIPELINE

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	TOTAL
<b>ENROLLMENT &amp; GRADUATION</b>													
Total Enrollment	39	37	48	59	68	77	77	77	77	77	77	77	77
Year 1	11	10	20	20	20	20	20	20	20	20	20	20	20
Year 2	9	11	10	20	20	20	20	20	20	20	20	20	20
Year 3	9	8	11	10	19	19	19	19	19	19	19	19	19
Year 4	10	8	8	10	9	19	19	19	19	19	19	19	19
Graduates (from previous academic year)	0	10	8	8	10	9	18	18	18	18	18	18	143
<b>PUBLIC SECTOR HEALTH WORKFORCE</b>													
Projected Additional Workforce Available	0	9	7	7	9	8	16	16	16	16	16	16	20
Graduates/Workforce to be trained as faculty	0	0	15	5									
Projected Additional Workforce Available	0	9	7	7	9	8	16	16	16	16	16	16	
Public Sector Workforce with Intervention	27	33	39	47	54	68	83	96	110	123	135		
Public Sector Workforce Target		154	155	156	156	157	158	159	160	160	161	162	

## FACULTY REQUIREMENTS

Mandatory faculty specialties required for program	required for the basic operation*	Other faculty available	Permanent Rwandan faculty available (2019-20)	Current Gap	Additional in-country	Clinicians who could be hired as faculty at UR	Policy-resolved Gap	Training required	notes	priority	In country fellowship potential order	VF needs per year	train
[Generalist]	15	1:5	2	13	25	20	0	MMed	The five lists	0			
[Subspecialist 1]	4	1:20	1	3	2	1	2	1-2-year fellow	basic needs	1	1	2mo	21(x2)
[Subspecialist 2]	2	1:40	0	2	3	2	0	1-2-year fellow	addtl clinicia	2	1	3mo	
[Subspecialist 3]	2	1:40	0	2	1	1	1	1-2-year fellow	addtl clinicia	3		need contin	21
[Subspecialist 4]	2	1:40	0	2	1	0	2	1-2-year fellow	addtl clinicia	4		2 weeks	21(x2)
<b>TOTAL</b>	<b>25</b>		<b>3</b>	<b>22</b>	<b>33</b>	<b>25</b>	<b>5</b>						

\*Based on 80 total trainees enrolled

## FACULTY DEVELOPMENT PIPELINE

	VF FTE/yr	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
<b>TOTAL PROGRAM ENROLLMENT</b>												
[Generalist] Faculty		11	48	59	68	77	77	77	77	77	77	77
Required		7	9	11	13	14	14	14	14	14	14	14
Available		7	15	15	15	15	15	15	15	15	15	15
Permanent		2	15	15	15	15	15	15	15	15	15	15
Visiting	1.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[Subspecialist 1] Faculty												
Required		2	2	3	3	4	4	4	4	4	4	4
Available		2	2	3	3	4	4	4	4	4	4	4
Permanent		1	2	2	2	4	4	4	4	4	4	4
Visiting	0.17	0.17	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[Subspecialist 2] Faculty												
Required		1	1	1	2	2	2	2	2	2	2	2
Available		1	2	2	2	2	2	2	2	2	2	2
Permanent		0	2	2	2	2	2	2	2	2	2	2
Visiting	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[Subspecialist 3] Faculty												
Required		1	1	1	2	2	2	2	2	2	2	2
Available		1	1	1	2	2	2	2	2	2	2	2
Permanent		0	1	1	1	2	2	2	2	2	2	2
Visiting	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[Subspecialist 4] Faculty												
Required		1	1	1	2	2	2	2	2	2	2	2
Available		1	1	1	2	2	2	2	2	2	2	2
Permanent		0	0	0	0	2	2	2	2	2	2	2
Visiting	0.04	0.04	0.04	0.04	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00