Ministry of Health and Sanitation
Government of Sierra Leone

Human Resources for Health Country Profile

Sierra Leone Country Profile

Updated December 2016
Directorate of Human Resources for Health

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Assumed Currency Conversion

1 US Dollar = 6,000 SLL

Acronyms

CHC – Community Health Centre

CHP – Community Health Post

CHO – Community Health Officer

CHW – Community Health Worker

CMO – Chief Medical Officer

CNO – Chief Nursing Officer

COMAHS – College of Medicine and Allied Health Sciences

CPD – Continuous Professional Development

CR – Cost Recovery Programme

DHIS – District Health Information System

DHMT – District Health Management Team

DHRH – Directorate of Human Resources for Health

DSA – Daily Service Allowance

EVD – Ebola Virus Disease

FHCI – Free Health Care Initiative

FBC – Fourah Bay College

FBO – Faith-based Organization

HRH – Human Resources for Health

HRMO – Human Resource Management Office

HSC – Health Service Commission

iCCM – Integrated Community Case Management

IPAM – Institute of Public Administration and Management

MCHP – Maternal Child Health Post

MEST – Ministry of Education, Science and Technology

MoFED – Ministry of Finance and Economic Development

MoHS - Ministry of Health and Sanitation

NGO – Non-governmental Organization

OOP – Out-of-Pocket

PBF – Performance-Based Financing

PHU – Peripheral Health Unit

PS – Permanent Secretary

SECHN – State Enrolled Community Health Nurse

SRN – State Registered Nurse

TBA – Traditional Birth Attendant

TEC – Tertiary Education Commission

Acknowledgments

The Directorate of Human Resource for Health remains committed in its objective to develop a well-resourced workforce that provides adequate, sustainable healthcare service delivery for the people of Sierra Leone. In fulfillment of this commitment, efforts to update the human resources for health (HRH) country profile for Sierra Leone began in mid-2016 so that the document could be used as a reference in developing the updated HRH Policy and the HRH Strategy for 2017-2021.The HRH Strategy and Policy will serve to guide the government, partners and other stakeholders to address critical HRH issues through feasible activities by streamlining planning and mobilizing resources.

This country profile is the result of three main activities to improve HRH data availability and accuracy undertaken by the Directorate over the past year, including a payroll cleaning exercise, a data collection effort to populate and operationalize a human resource information system and an effort to update to the MoHS attendance monitoring tool. These activities have made workforce planning and management more evidence-based, and have contributed to an increased understanding of the HRH situation in Sierra Leone.

I first must thank all stakeholders in the Sierra Leone health sector who contributed their time and knowledge toward the production of this country profile. This document is culmination of a number of data sources, including interviews with central-level government actors, district and hospital leadership, regulatory bodies, professional associations, partners and individual health workers from every public facility across the country. I particularly thank the leadership of the Ministry of Health and Sanitation, including the Honourable Minister of Health and Sanitation, the Permanent Secretary and the Chief Medical Officer and his team, for their support and guidance throughout the numerous activities that culminated in this country profile.

I also thank key technical partners of the HRH Directorate, the Clinton Health Access Initiative (CHAI) and the World Health Organization (WHO), who have supported the Directorate with data collection, meeting coordination, analysis, and final compilation of this country profile. I also thank our partners at Nestbuilders International, who made tremendous efforts in visiting over 1,300 facilities to collect the health worker data presented throughout this document.

I also thank our donors, the UK Department for International Development (DFID), the World Bank and the Global Fund to Fight HIV, TB and Malaria, for their commitment to funding activities to strengthen the health workforce in Sierra Leone.

Finally, I thank the staff of the Directorate of HRH for their commitment to improving HRH in Sierra Leone.

Samuel Coker
Director of Human Resources for Health
Ministry of Health and Sanitation

Executive summary

This Country Profile was updated in 2016 to provide a comprehensive overview of the human resources for health (HRH) situation in Sierra Leone to be used in development of the HRH Strategy for 2017-2021. The policy and strategy are designed to guide government, partners and other stakeholders in prioritizing, developing and implementing activities for improving HRH.

Persistent gaps in human resource capacity exist across all cadres, districts and health care levels within Sierra Leone's public sector health workforce. While the availability of accurate health workforce data has historically been low, the Directorate of Human Resources for Health (DHRH) of the Ministry of Health and Sanitation (MoHS) recently led a nation-wide data collection effort as part of the post-Ebola recovery process in early 2016. The public sector health workforce overview provided in this document thus describes the number of health workers receiving salary from the Government of Sierra Leone (GoSL) as of February 2016.

As of February 2016, the GoSL employed 9,910 health workers. This number includes all administrative and support staff, with 7,107 (or 72 percent) of employed health professionals providing patient services. The majority of the public sector health workforce provides services in government operated health facilities; however, a small number of government-employed health workers are posted in private facilities. As of 2016, the government health workforce is distributed across 1,323 work stations, including hospitals, peripheral health units (PHUs), clinics and administrative offices. The majority of health services are provided by public sector health workers, and very little data on the private sector workforce exists (Ministry of Health and Sanitation, 2013).

Close to half of the health workforce in Sierra Leone is made up of unsalaried workers, who work in government facilities, but do not receive GoSL salary. Recent data collection suggests as many as 9,120 unsalaried health workers are active in Sierra Leone's government health facilities, bringing the total number of public sector health workers to 19,030. Of the 9,120 unsalaried health workers surveyed as part of the 2016 MoHS payroll audit, 3,690 (40%) are serving as health professionals providing patient services, primarily in the lower-skilled cadres.

It is important to note that neither Community Health Workers (CHWs), Traditional Birth Attendants (TBAs) nor Traditional Healers are part of the Sierra Leone Civil Service, and are thus not included in this document. However, recent geo-mapping conducted by MoHS and UNICEF identified nearly 15,000 CHWs (UNICEF & Ministry of Health and Sanitation, 2016). The Directorate of Primary Health Care and its partners are currently in the process of finalizing a national CHW policy and strategy. Given the substantial number of CHWs and TBAs working in health at the community level, harmonizing the ongoing CHW Strategy development within the larger HRH Strategy development will be necessary.

Beyond highlighting the overall shortage of health professionals and the significant number of unsalaried health workers, this HRH Country Profile reviews critical challenges in HRH, including the uneven distribution of existing health workers, the need for improved coordination for both pre-service and in-service training and the need for additional attention to regulation. This profile also highlights the possibilities for using improved data availability to update information systems to enable more evidence-based health workforce planning and management.

1. Introduction

Purpose

This Country Profile was updated in 2016 to provide a comprehensive overview of the Human Resources for Health (HRH) situation and its challenges in Sierra Leone. This information served to inform the MoHS and its partners in the process of developing a new HRH policy and strategy for 2017 to 2021. The HRH policy and strategy were designed to guide the government, partners and other stakeholders in prioritizing, developing and implementing activities geared toward improving HRH.

Scope

This document describes key topics for understanding the current state of HRH in Sierra Leone, including management, educational and financing structures and descriptions of both the current and projected health workforce. The *health workforce* consists of both *health professionals* and *administrative and support staff*; the term health professionals describes health workers who provide patient services, while administrative and support staff provide non-clinical support services. This document does not include information on quality of clinical services or HRH challenges in the private sector.

Persistent gaps in human resource capacity exist across all cadres, districts and health care levels within Sierra Leone's public sector health system. While the availability of accurate health workforce data has historically been challenging, the Directorate of Human Resources for Health of the MoHS recently led a nation-wide data collection effort as part of the post-Ebola recovery process. The analyses presented in this country profile use health workforce data collected in February 2016 as part of a facility-level enumeration effort to audit the MoHS payroll (see Annex C for details on methodology). The public sector health workforce is thus described using the number of health workers receiving salary from the Government of Sierra Leone (GoSL) as of February 2016 who were found to be active during the payroll audit.[1] Additionally, a large number of health workers were found to be working at public health facilities without receiving government salary; these workers are included where indicated.

2. Country Context

Geography and demography

Sierra Leone is divided into four provinces, namely Northern, Southern and Eastern provinces, and the Western Area, which includes the capital city of Freetown. The regions are divided into 14 districts, which are subdivided into 152 chiefdoms, governed by local paramount chiefs. The country is located on the western coast of Africa, bordered by Guinea to the north and northeast, Liberia to the south and southeast and the Atlantic Ocean to the west. Sierra Leone has a total area of 71,740 km^2 (27,699 sq. mi), which is slightly larger than the Republic of Ireland or slightly smaller than the US state of South Carolina.

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[1] This excludes 754 health workers classified as unverified as a result of the audit and 316 health workers removed from payroll in June 2016 as part of the government's right-sizing program. These two categories were excluded from analysis in order to most accurately represent the active public sector health workforce currently practicing in facilities. However, it should be noted that changes to the workforce have occurred in the period of March to December 2016.

The climate is tropical with two distinct seasons: the rainy season from May to November, and the dry season from December to May. According to preliminary results from the 2015 Census, Sierra Leone has a total population of 7,075,241. English is the official language of Sierra Leone, and there are about 15 ethnic groups.

Socio-economic context

Sierra Leone's civil war (1991-2002) eroded infrastructure and human capacity throughout the country. Over a decade after the war ended, the effect of the conflict on the health infrastructure and HRH remained prominent. Efforts made in the post conflict phase to improve the health sector suffered a major blow in the more recent, Ebola crisis (2014-2015), which created an additional burden on the health sector and the country as a whole. These two crises resulted in a range of social and economic challenges. As a result, real gross domestic product (GDP) growth in 2014 was 7.0%, compared to the pre-Ebola forecast of 11.3% (World Bank Group, 2016) (Government of Sierra Leone, 2014).

As of 2015, GDP per capita in Sierra Leone was USD 653 (World Bank, 2015). The 2015 United Nations' Human Development Index rank for Sierra Leone is 181 out of 187 countries (United Nations Development Programme, 2015).

Political context

Sierra Leone is a constitutional republic with a directly elected President and a unicameral legislature. The 1991 Constitution established three main branches of Government, namely an Executive, a Legislature and a Judiciary.

The President, who is the head of state, the head of Government and the Commander-in-Chief of the Sierra Leone Armed Forces and the Sierra Leone Police, leads the executive branch. The President appoints and leads a cabinet of ministers, which Parliament approves. Popular vote elects the President for one or a maximum of two five-year terms.

The Parliament of Sierra Leone has 124 seats and is Sierra Leone's legislature. Parliament includes representatives from all 14 districts, with 112 members elected for four-year terms through proportional representation; there are also twelve Paramount chiefs in Parliament. There are various parliamentary committees responsible for the main sectors including a health sector committee.

Sierra Leone's highest court, the Supreme Court, leads the judicial branch. The President appoints judges on the advice of the Judicial and Legal Service Commission with the approval of Parliament.

Beyond the 14 districts and 149 chiefdoms mentioned above, the 2004 Local Government Act established 19 local councils, five city councils and 14 district councils, including Freetown, the capital.

The current President is Ernest Koroma, who was elected in 2007 and re-elected to a second-term in 2012. There will be both presidential and parliamentary elections in 2018.

Health status

Sierra Leone has some of the poorest health indicators in the world, with a life expectancy of 50 years at birth and under-five mortality and maternal mortality rates that are among the highest in the world (World Health Organization, 2016). The figure below outlines the health situation in Sierra Leone.

Figure 1: Health situation in Sierra Leone.
Data for life expectancy and disease burden data from World Health Organization (2016), for health outcomes from Evans, Goldstein and Popova (2015) and for Ebola outbreak from Centers for Disease Control and Prevention (2016).
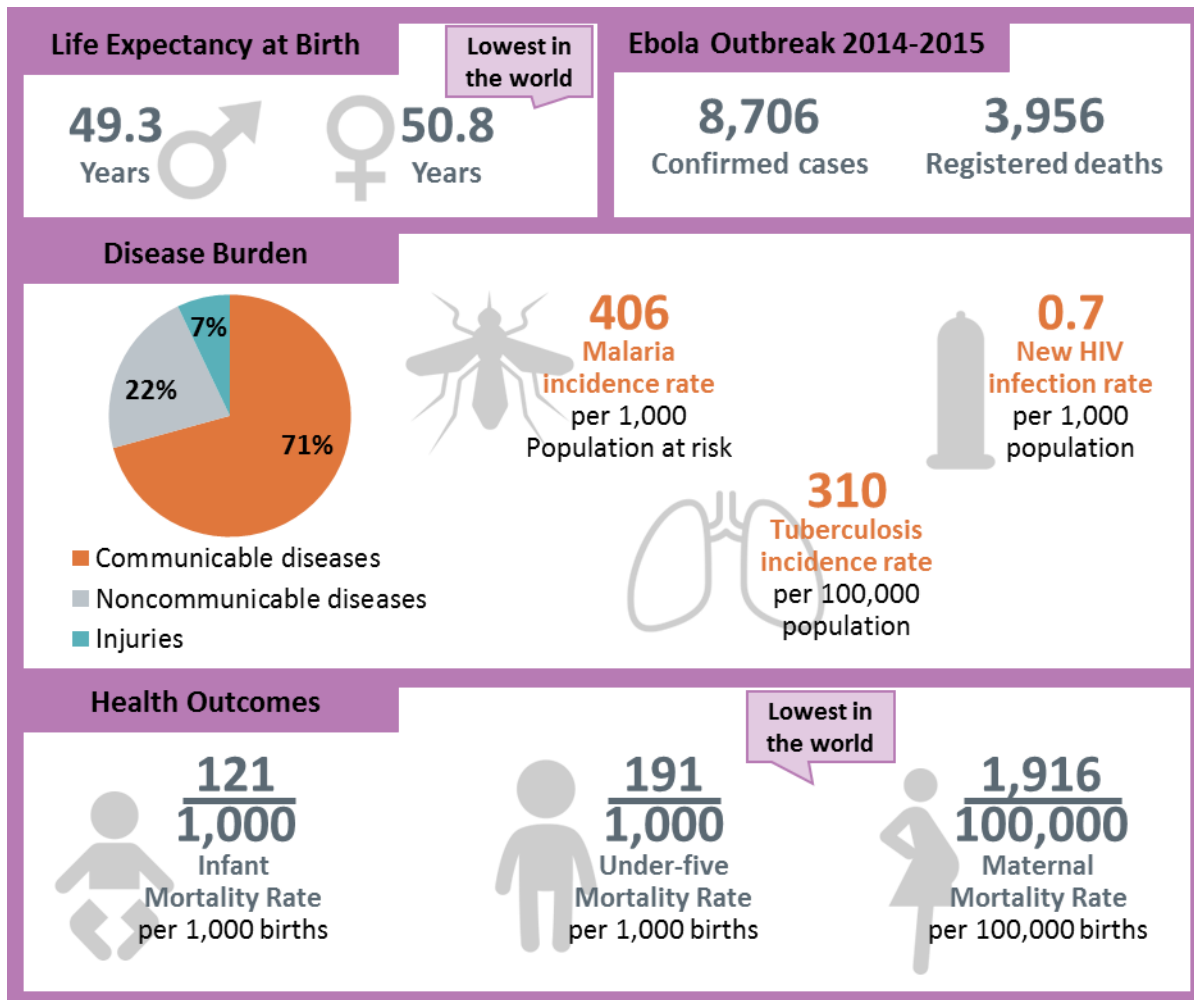
3. Country Health Services

Regulation

Sierra Leone's *Public Health Ordinance of 1960* is the legislative framework that defines the powers of the state to regulate areas concerned with the public health such as sanitation, housing, infectious disease control and food safety. While there have been numerous amendments to the *Public Health Ordinance 1960*, the most recent being the inclusion of Ebola in the "notified disease" category in 2014, efforts are underway to contextualize the Ordinance to public health best practices and modern trends.

 The other notable regulations on health and sanitation in Sierra Leone include:

(i) The *Medical Practitioners and Dental Surgeons Act 2008*
(ii) The *Nurses Act 1960*, which defines regulations for the training, registration, enrolment and the practice of nurses and also defines penalties for non-compliance
(iii) The *Midwives Act 1960*, which regulates the training, registration, enrolment and practice of midwives or persons engaged in midwifery and defines penalties for non-compliance.
(iv) The *Pharmacy and Drugs Act 2001*, which controls the supply, manufacture, storage and transportation of drugs, including nutritional agents and cosmetics; and regulates the practice of the pharmacists in the country.
(v) The *Sierra Leone Health Service Commission Act 2011*, which established the Health Service Commission as an independent body created to assist the MoHS to provide quality, affordable, and accessible healthcare services to the people of Sierra Leone
(vi) The *West Africa Health Examination Board Act 1986*, which ratifies and establishes the West Africa Health Examination Board in Sierra Leone which conducts examinations for entry into various healthcare training programmes.
(vii) The *National Pharmaceutical Procurement Unit Act 2012*, which establishes the National Pharmaceutical Procurement Unit as an autonomous body responsible for the procurement, storage, distribution and management of drugs and medical supplies, for and on behalf of all public health facilities throughout Sierra Leone.

At the time of publishing of this document, the *Community Health Professionals Act 2016* and the *Nurses and Midwives Act 2015* were being considered for ratification in order to strengthen and upgrade the regulatory ecosystem.

Health policy

The MoHS has developed several policies to guide health service delivery in the country post conflict including the *National Health Policy* in 2002 that was subsequently revised in 2009, as well as the *Reproductive Health Policy and Child Health Policy* in 2008 that was subsequently used to develop the *Reproductive, Newborn, and Child Health Strategy for 2011-2015*. In addition to these policies, the Government enacted the *Local Council Act (2004)* as a means of enhancing the participation in and the ownership of the health care system by the local councils and their communities and the *Hospital Boards Act (2003)* to address the management of all hospitals nationwide.

The *National Health Sector Strategic Plan (NHSSP) 2010-2015* provides a common strategic framework to guide interventions by all actors at all levels of the health system in Sierra Leone. The NHSSP shapes strategic and operational plans of the MoHS, formalizes coordination mechanisms for the participation of all stakeholders and implementers in the health sector, and informs the development of long-and medium-term expenditure frameworks as well as the annual budget. The *Basic Package for Essential*

Health Services (BPEHS) 2010 is the operational plan for the policy objectives of the NHSSP. The BPEHS was intended to be a high impact, cost-effective primary care service delivery mechanism to scale up health services, with a focus on maternal, child and sexual and reproductive health. While the NHSSP was designed specifically for a five-year time frame, the BPEHS continues inform policy with the introduction of the revised *BPEHS for 2015-2020*, which is closely aligned to the *post-Ebola Health Sector Recovery Plan 2015-2020* and the drafting of the *Health Sector Strategic Plan for 2015-2020*.

In 2010, the MoHS launched the *Free Health Care Initiative (FHCI)* to increase access to health services and provide free maternal and child health services to pregnant women, lactating mothers and children under five years. The FHCI also provides malaria testing and treatment services free to the entire population.

Given the significant involvement of donors and partners in the health sector in Sierra Lone, development partners working in the country signed a Health Compact with the Government of Sierra Leone in April 2011 which outlined the rules of engagement for partners who wanted to contribute to the health sector in Sierra Leone. In 2015, the GoSL introduced the Service Level Agreement (SLA) mechanism, in addition to the Health Compact, as an approach to enable the MoHS to set health priorities and ensure a more equitable distribution of partners and types of interventions.

HRH Polices

The *Human Resources for Health Development Plan 2004-2008*, was first developed in 2004 and subsequently revised in 2006. This was the pre-cursor to Sierra Leone's first post conflict *Human Resources for Health Policy* in 2006. This was followed by a revision of the Scheme of Service between 2006 and 2007, which was again revised in March 2010 (Bertone, Samai, Edem-Hotah, & Witter, 2013).

Following the launch of FHCI in 2010 In March 2011, the Performance Based Financing (PBF) Scheme was introduced in March 2011 as form of incentivizing performance of healthcare workers in the country. The *Human Resource for Health Strategic Plan 2012-2016*, which is currently in place, was also guided by the FHCI.[2]

A time-line of key post-conflict polices is shown below:

Figure 2: Timeline of HRH policies from 2002 to 2012.
Figure adapted from Bertone, Samai, Edem-Hotah, & Witter (2013).
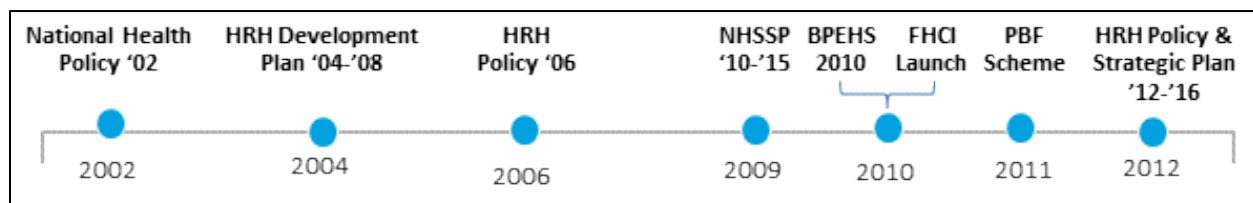
Governance of the health sector

At the national level, a Minister and two Deputy Ministers lead the MoHS. The Ministry has two different divisions: a professional division and an administrative division. The professional division is led by the Chief Medical Officer (CMO) and has nine directorates, including:

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[2] As of December 2016

- Disease Prevention and Control
- Reproductive and Child Heath
- Primary Health Care
- Training, Hospital and Laboratories, Nursing, Policy, Planning and Information
- Research and Non-communicable Disease
- Teenage Pregnancy
- Drugs and Medical Supplies

A Director who coordinates health programmes and activities leads each directorate.

A Permanent Secretary (PS) leads the administrative division and coordinates four directorates, which include:

- Information Communication Technology
- Support Services (e.g. stores, transport, facilities and other activities)
- Financial Resources (the Accounting Officer)
- Human Resources for Health
- Donor and NGO Coordination

A separate Directorate of Internal Audit reports directly to the Minister of Health and Sanitation.

At the district level, a District Health Management Team (DHMT) is responsible for the overall health planning, implementation, coordination, monitoring and evaluation of health services under the leadership of the District Medical Officer (DMO) across the country's 14 health districts. The DMO is responsible for overseeing all primary care services, while the Medical Superintendent of each district government hospital is responsible for overseeing care provided at hospital level. The DHMTs are an extension of the MoHS, but as established by the *Local Government Act of 2004*, work under the local council. The *Local Government Act (2004)* describes the extent of decentralization for different levels of care: primary and secondary care falls under the jurisdiction of the local council, while tertiary hospitals remain under the jurisdiction of central level MoHS. The local council receives yearly budget allocations to ensure provision of primary and secondary care at district level. However, the decentralization has only been partially implemented; important functions such as the supply chain and HRH remain largely managed from central level.

The management structure specific to HRH is further described in chapter 6.

Health system and services

The country's health service delivery system is pluralistic. The central government, faith-based organizations (FBOs), local and international non-governmental organizations (NGOs), voluntary organizations and the private sector all provide health services. The private sector is, within the region, comparatively under developed and provides mainly curative care for inpatients and outpatients on a fee-for-service basis. Private health facilities operate under the authority of individual owners and a board of directors, mainly in urban areas.

In Sierra Leone, Peripheral Health Units (PHUs) provide access for primary care, which include the facility types described below and further depicted in For secondary care, district hospitals provide technical support to the PHUs and serve as secondary level referral facilities for primary health care. Secondary care facilities provide the following health services: outpatient services for referred cases from PHUs; primary care services for the local population within its immediate environs; inpatient (admission) health facilities; diagnostic services; and management of accidents and emergencies (Figure 3).

For tertiary care, three major government hospitals located in Freetown provide specialist health services including general surgery, internal medicine, obstetrics and gynecology and pediatrics. There also a number of private hospitals and clinics that provide specialist health services and are at least partially staffed by government health workers, including Sierra Leone-China Friendship Hospital, Emergency Surgical Centre and Aberdeen Women's Centre.

Figure 3.

- Maternal and Child Health Posts (MCHPs): Situated at village level, MCHPs serve populations of less than 5,000. These units are intended to be staffed by Maternal and Child Health Aides (MCH Aides) who are trained to provide services including: antenatal care; supervised deliveries; postnatal care; family planning; growth monitoring and promotion for under-five children; immunization; health education; management of minor ailments and referral of cases to the next level. Community health workers (CHWs), Traditional Birth Attendants (TBAs), community-based motivators, community volunteers and others support MCH Aides.

- Community Health Posts (CHPs): CHPS are situated in small towns serving populations between 5,000 and 10,000 and are staffed by State-Enrolled Community Health Nurses (SECHNs) and MCH Aides. They provide the same types of services provided at MCHPs, but they also include prevention and control of communicable diseases and rehabilitation. Cases that are more complicated are referred to Community Health Centres.

- Community Health Centres (CHCs): CHCs are located at chiefdom level. They usually cover a population ranging from 10,000 to 20,000 and include the following staff: Community Health Officers (CHOs), SECHNs, MCH Aides, an Epidemiological Disease Control (EDCU) Assistant and an Environmental Health Assistant. They provide all services provided at the CHP level, with the addition of environmental sanitation, and supervise the CHPs and MCHPs within each chiefdom.

Across Sierra Leone's 14 districts, there are 1,196 PHUs, including: 451 in Northern Province, 357 in Southern Province, 281 in Eastern Province and 107 in Western Province, of which the vast majority (~90%) belong to the GoSL, while roughly ten percent belong to FBOs, the private sector and NGOs.

For secondary care, district hospitals provide technical support to the PHUs and serve as secondary level referral facilities for primary health care. Secondary care facilities provide the following health services: outpatient services for referred cases from PHUs; primary care services for the local population within its immediate environs; inpatient (admission) health facilities; diagnostic services; and management of accidents and emergencies (Figure 3).

For tertiary care, three major government hospitals located in Freetown provide specialist health services including general surgery, internal medicine, obstetrics and gynecology and pediatrics. There also a number of private hospitals and clinics that provide specialist health services and are at least partially staffed by government health workers, including Sierra Leone-China Friendship Hospital, Emergency Surgical Centre and Aberdeen Women's Centre.
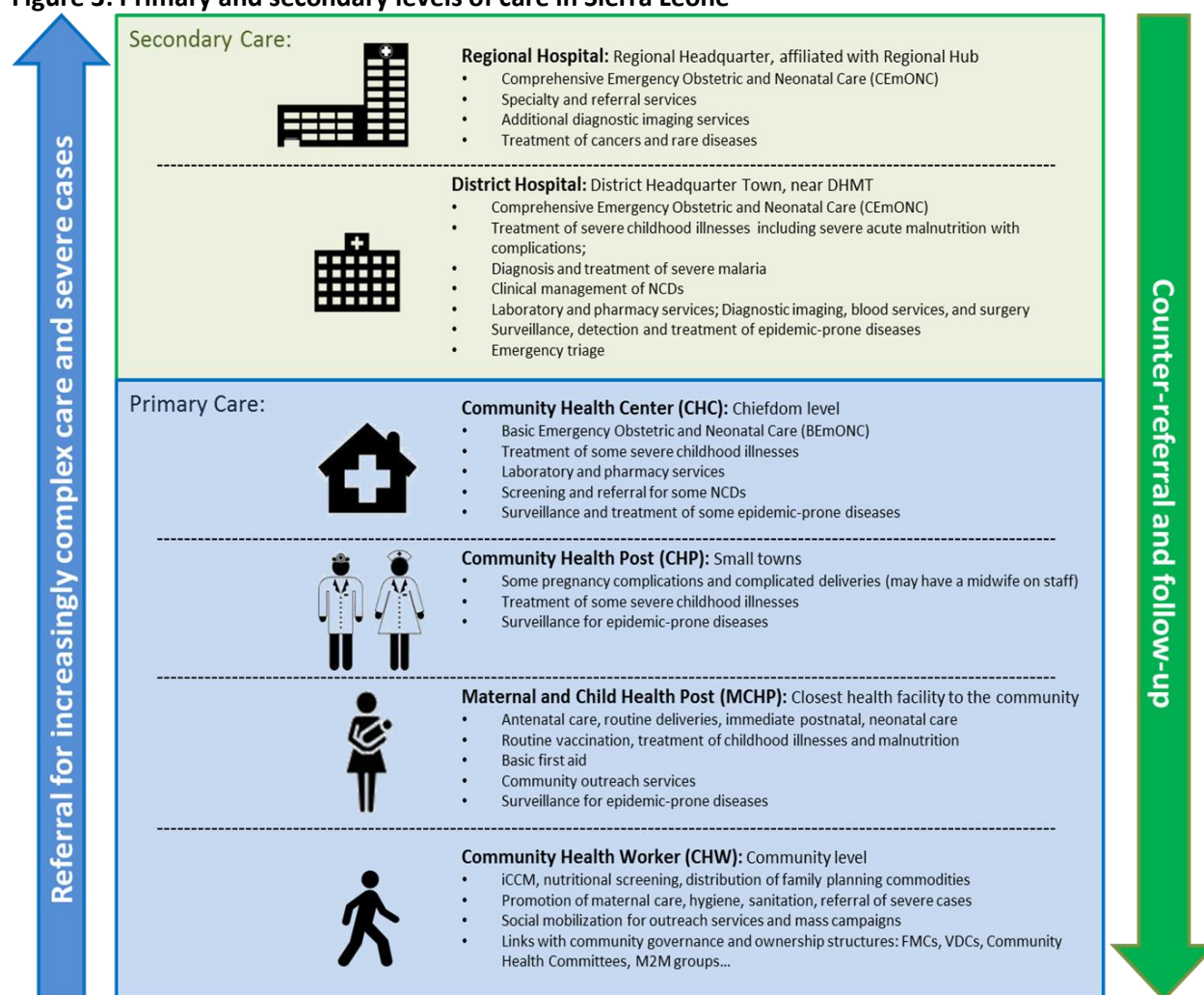
Figure 3: Primary and secondary levels of care in Sierra Leone

Financing

Total health expenditure is approximately USD 590 million, or USD 95 per capita, which is broken down by expenditure type in the table below (Ministry of Health and Sanitation, 2013).

Table 1: Total Health Expenditure by Expenditure Type

Expenditure type	Percent of Total Health Expenditure
Out-of-pocket spending	61.6%
Development partners	24.4%
Non-governmental organizations	7.2%
Government	6.8%

Government expenditure on health as a percentage of total government expenditure is 11%, approaching the 15% target of the Abuja Declaration. Personnel salaries make up close to 60% of government health spending. The other major category of spending is central-level services, which account for more than 25% of spending. However, the share of resources for local councils is lower than

10%, and resources for PHUs range between 2.8% to 4.7% of government spending on health (Ministry of Health and Sanitation, 2013).

There is no explicit health financing strategy. The Government introduced the FHCI in April 2010, which sought to abolish healthcare costs for pregnant women, new mothers and children under five at the point of service delivery. The FHCI was accompanied by performance-based financing, but a long term strategy and plan for increasing domestic resource mobilization, reducing both out of pocket (OOP) spending and external dependence, as well as mechanisms to enhance resource efficiency and effectiveness, are not yet in place.

Health information systems

Sierra Leone has adopted and implemented the District Health Management Information System (DHIS) nationally, with the goal of integrating and improving the quality and efficiency of data capture, data storage, transfer, analysis and dissemination.

As part of this system, health service provision data is reported through paper-based forms at the health facility level, via the Monitoring and Evaluation officer at the DHMT to the national level MoHS on a monthly basis. While data reported through the DHIS captures overall staffing numbers, there are known limitations to the quality and level of detail. A rapid assessment of the effect of Ebola on the DHIS also assessed the data consistency between the facility registers, monthly forms and electronic data. The report found high levels of inconsistencies between all sources of data, with higher inconsistencies between the monthly summary forms and the electronic data (DHIS) than between the facility registers and monthly forms. For example, in October 2014, more than a third of the analyzed indicators were showing variation of more than 50% between the summary forms and the electronic database. There were also differences in quality depending on which indicator and which district was analyzed. In summary, the health management data quality was reported to be low with no significant over- or underreporting to be found (Options & Ministry of Health and Sanitation, 2015).

In addition to the DHIS, there are health information systems specific to human resources, all managed by the DHRH. These information systems are outlined in section 6.

Medical products and technologies

Sierra Leone's supply chain prior to Ebola faced a number of challenges which led to the creation of the NPPU in 2012, an autonomous body whose mandate is to consolidate procurement and streamline distribution of commodities across the health sector.

The NPPU was responsible for distribution of commodities under the FHCI and the Cost Recovery (CR) programme, and was also been involved in the distribution of Ebola commodities to treatment facilities, holding centres and PHUs during the outbreak. Parallel supply chains exist for an assortment of programmatic areas, including HIV, TB, malaria, nutrition, neglected tropical disease (NTD) and others.

In March 2016, the GoSL initiated a restructuring exercise to re-evaluate the governance and management of the NPPU. The reform process is currently ongoing, and FHCI commodities are largely funded by donors and distributed via a parallel system at the time of writing.

4. HRH Situation

Overview

At present, the GoSL employs 9,910 health workers nationwide.[3] This number includes all administrative and support staff, with 7,107 (72%) health professionals providing patient services.[4] The majority of the public sector health workforce provides services in government operated health facilities. However, a small number of government-employed health workers are posted in private facilities (1.4%), while an additional 2.0% of the GoSL-employed workforce is active in facilities governed through a public-private partnership, such as Emergency Hospital and China-Sierra Leone Friendship Hospital. As of 2016, the government health workforce is distributed across 1,323 work stations, including hospitals, PHUs, clinics and administrative offices. The majority of health services are provided by public sector health workers and very little data on the private sector workforce exists (Ministry of Health and Sanitation, 2013).

An additional 48% of the health workforce in Sierra Leone is made up of unsalaried workers, who work in government facilities but do not receive formal GoSL salary. Recent data collection activities carried out by the DHRH and partners suggest that as many as 9,120 unsalaried health workers are active in Sierra Leone's government health facilities, bringing the total number of public sector health workers to 19,030. Of the 9,120 unsalaried health workers surveyed as part of the 2016 MoHS payroll audit, 3,690 (40%) are serving as health professionals providing patient services, primarily in the lower-skilled cadres. Further details on this segment of the workforce are provided in **The Unsalaried Workforce** fact box later in this section.

It is important to note that neither Community Health Workers (CHWs), Traditional Birth Attendants (TBAs) nor Traditional Healers are part of the Sierra Leone Civil Service, and are thus not included in the health workforce analyses described in this document. However, recent geo-mapping conducted by MoHS and UNICEF identified nearly 15,000 CHWs (UNICEF & Ministry of Health and Sanitation, 2016). The Directorate of Primary Health Care and its partners are currently in the process of finalizing a national CHW policy and strategy. Given the substantial number of CHWs and TBAs working in health at the community level, harmonizing the ongoing CHW Strategy development within the larger HRH Strategy development will be necessary to ensure distinct scopes of practice are defined and implemented at every level of service and that training and data management efforts are harmonized and aligned.

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[3] This number excludes health workers removed from payroll as a result of the 2016 MoHS payroll audit and health workers granted early retirement from the civil service in June 2016. The number includes a small number of active health workers employed by other ministries than MoHS.

[4] Classification of health professionals as defined by the International Standard Classification of Occupations (ISCO); does not include Nursing Aide, Support Staff, or Administrative Staff cadres

Staffing Requirements

As part of the development of Sierra Leone's *BPEHS 2015*, staffing norms by cadre were defined for each facility type (See Annex A). Based on the number of government-owned facilities of each type, as counted as part of the 2016 payroll audit, and the average number of wards per hospital, this amounts to the following national-level aggregated staffing requirement:

Table 2: Nationally aggregated staffing requirements by cadre and facility type as per BPEHS

Cadre	Number of staff required per cadre by facility type				
	MCHP n= 596	CHP n=359	CHC n=229	Hospital n=24	Total n=1,208
Administrative staff	0	0	0	336	**336**
Community Health Officer/Assistant	0	359	687	72	**1,118**
Dentistry	0	0	0	120	**120**
Environmental/Public Health	0	0	458	72	**530**
Laboratory Staff[5]	0	0	458	192	**650**
MCH Aide	1,788	718	916	0	**3,422**
Medical Officer	0	0	0	312	**312**
Medical Specialist	0	0	0	144	**144**
Midwifery	0	359	458	192	**1,009**
Nurse (Higher cadres)	0	0	0	2,592	**2,592**
Nurse (SECHN)	0	359	458	1,752	**2,569**
Nurse Specialist	0	0	0	360	**360**
Nursing Aide	0	0	0	1,728	**1,728**
Other Allied Health Professional	0	0	229	408	**637**
Pharmacist	0	0	0	72	**72**
Pharmacy Technician	0	0	229	144	**373**
Support staff	2,980	2,154	1,603	1,656	**8,393**
Total	**4,768**	**3,949**	**5,496**	**10,152**	**24,365**

As the *BPEHS 2015* focuses on primary and secondary care, staffing norms are not available for tertiary level hospitals, or for health workers providing administrative functions requiring clinical skills.[6]

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[5] Including Medical Laboratory Scientific Officers, Laboratory Technicians, Laboratory Assistants, and Laboratory Aides
[6] Tertiary hospitals are included among other hospitals in the table, implying that the total target calculation does not differentiate staffing norms between secondary and tertiary hospitals. Additionally, there are certain administrative offices that use clinical staff (e.g. the Pharmacy Board).

Health workforce growth trends

Insufficient staffing levels have been long recognized as a key barrier to a resilient and responsive health system in Sierra Leone. The gap between staff needed and staff practicing has historically been most critical in higher cadres, particularly doctors and midwives. However, since the introduction of the FHCI in 2010, the health workforce has grown significantly, effectively doubling by 2011 (Oxford Policy Management, 2015). The figure below shows the change in ratio of clinical health workers to population over time and illustrates the significant increase in the relative number of doctors and nurses in 2010, the year the FHCI was introduced (Witter, Wurie, & Bertone, 2014).

Figure 4: Population data analysis of doctors and nurses in Sierra Leone (2005 to 2011)
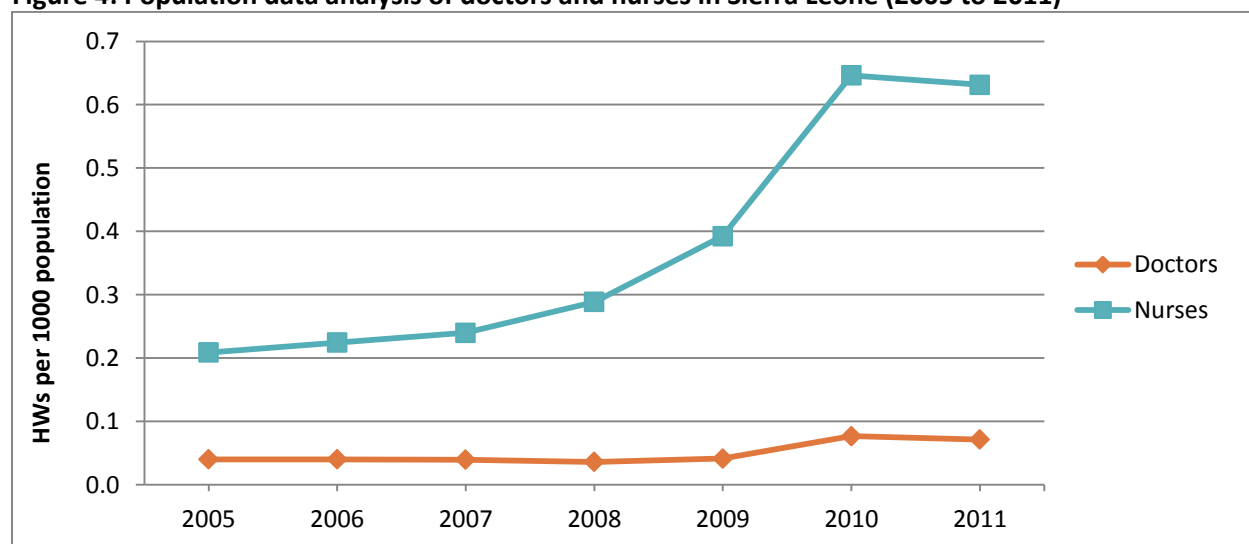
Although national attrition data is poor, health worker attrition rates seem to have declined in the years since introduction of the FHCI (Wurie, Samai, & Bertone, 2014). Attrition estimates for the health professional workforce ranged between 3% and 41% in 2011, and generally increase with skill level, as health workers become qualified for higher paying opportunities in other sectors or countries (Witter, Wurie, & Bertone, 2014). This trend is consistent with attrition estimates in other countries.

The overall positive trend in health workforce numbers since 2009 was interrupted by the recent Ebola crisis. The Ebola epidemic claimed the lives of at least 257 health workers in Sierra Leone, and caused many others to temporarily leave the workforce.[7] However, the President's Post-Ebola Recovery Plan recognizes this and emphasizes the importance of HRH in strengthening Sierra Leone's health system.

Though the health workforce has been growing overall, it is interesting to note that a significant number of health workers are nearing the national retirement age of 60 (Figure 5). Approximately 24% of all health workers are currently over the age of 50, while 394 health workers are already over 60.

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[7]Directorate of Human Resources for Health, MoHS

Figure 5: Age distribution of the health workforce (n=9,910)
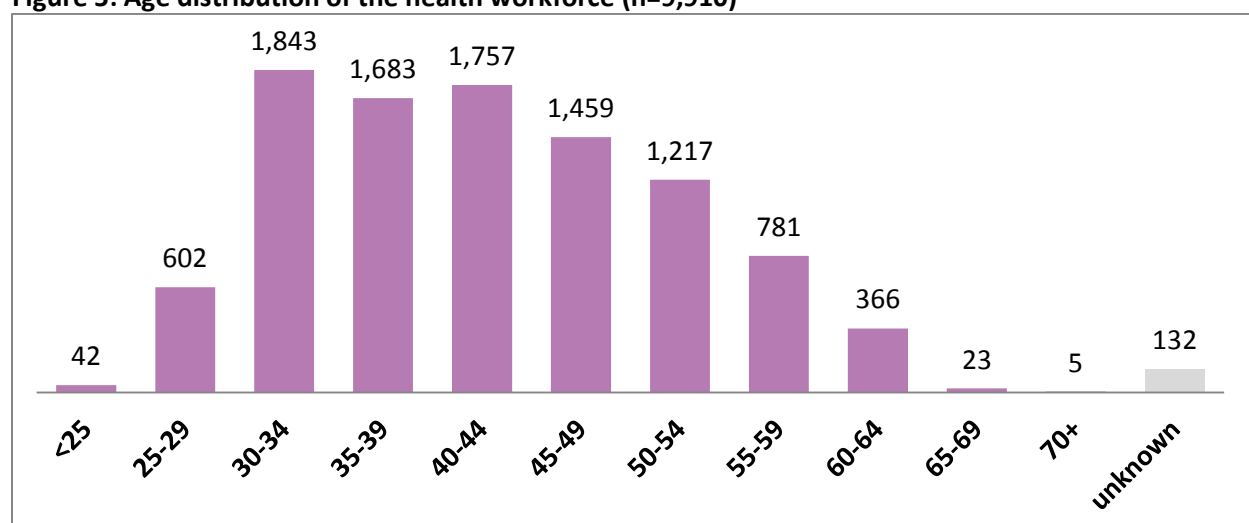
Health workers by cadre, skill level and gender

Overall, the workforce is largely built around nursing cadres, with a high proportion of the lower-skilled nurses, SECHNs. There is also a large number of MCH Aides, who are trained to provide safe motherhood and under-five services at the community level, and nursing aides (Sierra Leone Health Service Commission, 2015). In contrast, Sierra Leone has a low proportion of higher-skilled nurses, midwives and doctors. The shortage of medical officers is even more critical when taking into account that 26% of all medical officers and 37% of medical specialists are serving in administrative roles or studying rather than practicing as clinicians in facilities.[8] Sierra Leone also has a higher-skilled clinical cadre called Community Health Officers (CHOs), which are equivalent to physician assistants in other countries. A full breakdown of the GoSL health workforce by cadre is provided below.

In the unsalaried worker population, the distribution of health workers by cadre is even more skewed toward lower-skilled workers, with 46% being support staff, 25% SECHNs and 8% MCH Aides (see unsalaried workforce fact box).

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[8] Medical officers and specialists serving in administrative roles are defined as those posted to administrative offices and health training institutions, rather than health facilities.

Figure 6: GoSL-employed health workers by cadre (n=9,910) in 2016

Cadre	Count (%)
Nurse (SECHN)	2,659 (27%)
MCH Aide	1,677 (17%)
Support staff	1,388 (14%)
Nursing Aide	829 (8%)
Community Health Officer/Assistant	621 (6%)
Administrative staff	546 (6%)
Environmental/Public Health	351 (4%)
Nurse (Higher cadres)	344 (3%)
Midwife	313 (3%)
Laboratory Staff	305 (3%)
Other Allied Health Professional	191 (2%)
Pharmacy Technician	159 (2%)
Medical Officer	156 (2%)
Nurse Specialist/ Tutor	155 (2%)
Pharmacist	82 (1%)
Dentistry	53 (1%)
Medical Specialist	41 (<1%)
Unknown	40 (<1%)

Overall, the MoHS-employed health workforce is 62% female and 37% male.[9] The high percentage of females is due to the health workforce being largely nursing based, as the majority of nurses are female. In fact, typically only women are permitted to train as maternal child health aides and midwives. The gender distribution is reversed for cadres requiring higher levels of education, such as medical officers and pharmacists, in which health workers are over 70% male (Figure 7).

[9] Does not include 119 health workers (1%) for whom gender is unknown

Figure 7: Gender breakdown of MoHS-employed health workers by cadre
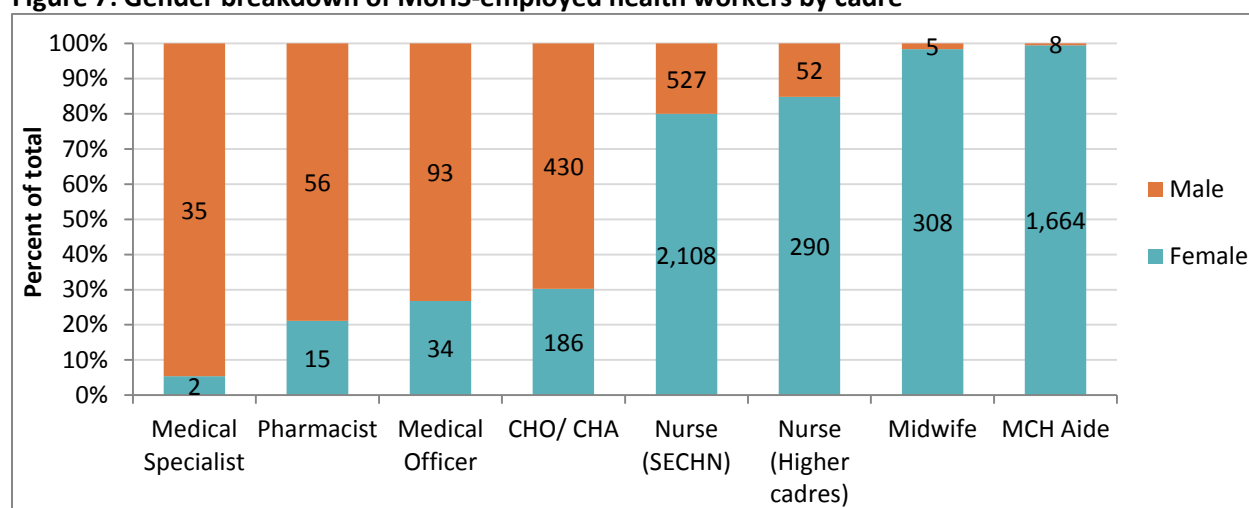
There is also a clear pattern when looking at the gender distribution across the salary pay scale, which can be used to indicate a combination of skill level and seniority (See Annex B for further analysis of the health workforce distribution by salary scale). Lower paid positions tend to be mainly female, while the highest paid positions are filled by males (Figure 8). This can also partially be explained by the high percentage of lower-skilled female nurses in the workforce, while the most senior level MoHS positions are often filled by doctors, of which the majority are male.

Figure 8: Gender breakdown of MoHS-employed health workers by seniority level[10]
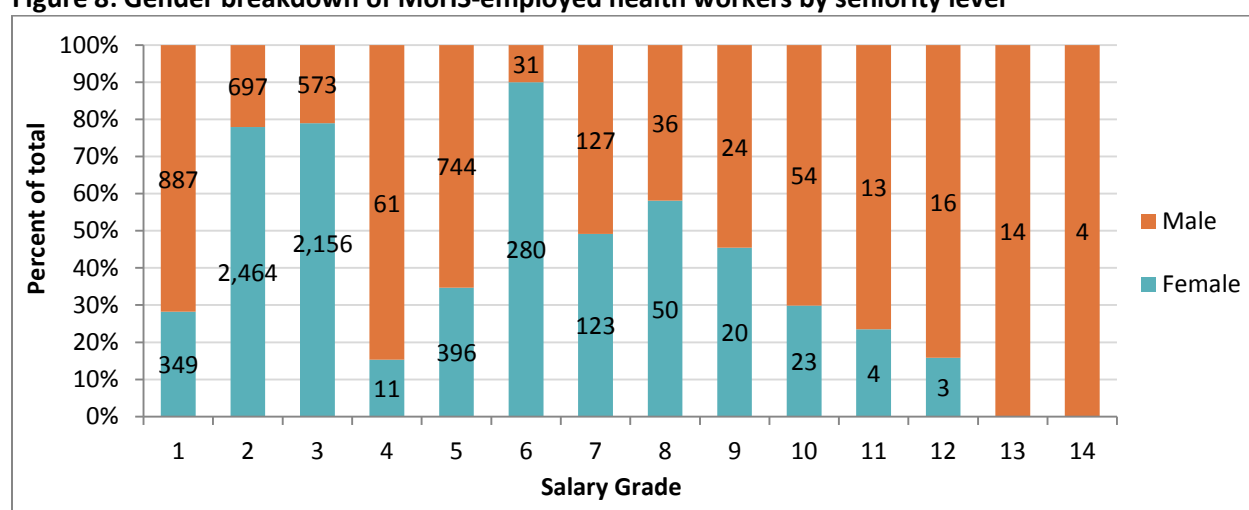
Outside of the civil service, there are up to 15,000 CHWs and TBAs, as well as traditional healers. There was a geomapping census completed by the MoHS and UNICEF in 2016, which showed that almost all of the country's CHWs (91%) are within a 5 km radius of a PHU, over half (53%) are within 3 km and nearly a third (30%) are serving within 1 km. In 2016, CHWs contributed an additional 10% to geographic access beyond what is covered within 5km of a functioning PHU. Thirty-five percent of CHWs identified were female, and most (78%) are literate (UNICEF & Ministry of Health and Sanitation, 2016).

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[10] Does not include 119 health workers for whom gender is unknown

UNICEF, with the support of the MOHS, began piloting implementation of Integrated Community Case Management (iCCM) by CHWs through implementing partners in 2010. By 2015, this approach was used in seven districts, reaching nearly half the country. In 2012, the country developed its first *National Community Health Workers Policy and Strategy*, taking a step towards uniting these diverse and valuable community members under one umbrella. While CHWs were still considered to be volunteers, the 2012 policy outlines standardized services, training materials, job aids, and other support that CHWs need to serve and improve the health of their communities.

CHWs in Sierra Leone played critical roles during the 2014-2016 Ebola outbreak. Many acted as community mobilizers, community-event based surveillance volunteers, contact tracers and members of burial teams. Following this, the National CHW Programme launched a review and updating of the national CHW policy and strategy in 2015.

Distribution across districts and facility types

Geographic distribution

Recent data collection revealed the concentration of the health workforce to a few districts to be more pronounced than previously understood. Approximately 42% of the workforce currently employed by the MoHS is active in Western Area and 10% in Bo district, where the country's second largest city is located, while the remaining 47% of health workers are spread throughout the rest of the country.

Even after accounting for relative district populations, the concentration of health workers in Freetown (Western Area Urban) remains noticeable. The density map below (Figure 9) shows the clinical health worker to population ratio by district, with the highest ratio being in Western Area Urban hospitals and PHUs, at 20.8 clinical health workers per 10,000 people (Statistics Sierra Leone, 2016).

Figure 9: Clinical health workforce density (per 10,000 population)[11]
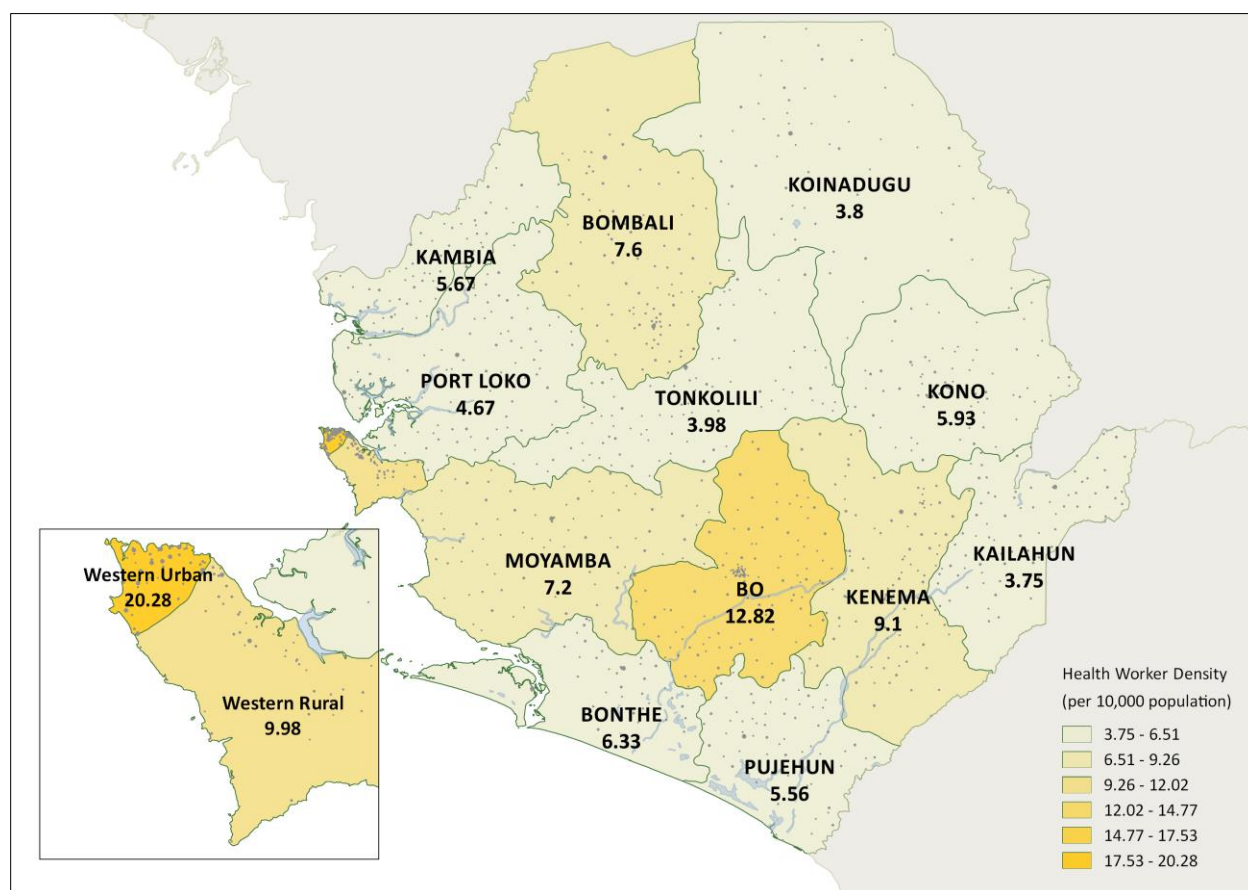
The uneven distribution of the health workforce is most pronounced in highly-skilled cadres more likely to be found in large tertiary hospitals or administrative offices in Freetown, such as medical officers, higher cadre nurses and pharmacists. The health worker-to-population ratio for these cadres is between eight and thirteen times higher in Western Area Urban than in other districts (Figure 10A). In contrast, cadres needed in both PHUs and hospitals, such as midwives and community health officers and assistants, are more evenly distributed across districts, though a slight shift toward Western Area Urban persists (Figure 10B).

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[11] Includes all health professional cadres and excludes administrative staff, support staff and nursing aides

Figure 10: Health worker density by cadre (per 10,000 population)[12]

A	Medical Officers/ Specialists	Nurses (higher cadres)	Pharmacists
Northern			
Bombali	0.10	0.38	0.03
Kambia	0.06	0.29	0.06
Koinadugu	0.05	0.17	0.05
Port Loko	0.10	0.20	0.03
Tonkolili	0.06	0.11	0.02
Eastern			
Kailahun	0.08	0.06	0.04
Kenema	0.08	0.18	0.07
Kono	0.08	0.12	0.00
Southern			
Bo	0.10	0.45	0.03
Bonthe	0.20	0.20	0.05
Moyamba	0.13	0.28	0.06
Pujehun	0.06	0.38	0.03
Western			
Western Area Rural	0.27	0.25	0.02
Western Area Urban	1.10	1.92	0.50

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[12] Does not include 26 health workers from these cadres on study leave

B

Region	District	Midwives	CHOs/CHAs
Northern	Bombali	0.41	0.56
	Kambia	0.44	0.84
	Koinadugu	0.32	0.44
	Port Loko	0.39	0.52
	Tonkolili	0.26	0.68
Eastern	Kailahun	0.15	0.69
	Kenema	0.34	0.93
	Kono	0.26	0.42
Southern	Bo	0.47	2.40
	Bonthe	0.30	1.05
	Moyamba	0.50	1.01
	Pujehun	0.35	0.95
Western	Western Area Rural	0.32	0.63
	Western Area Urban	1.00	0.96
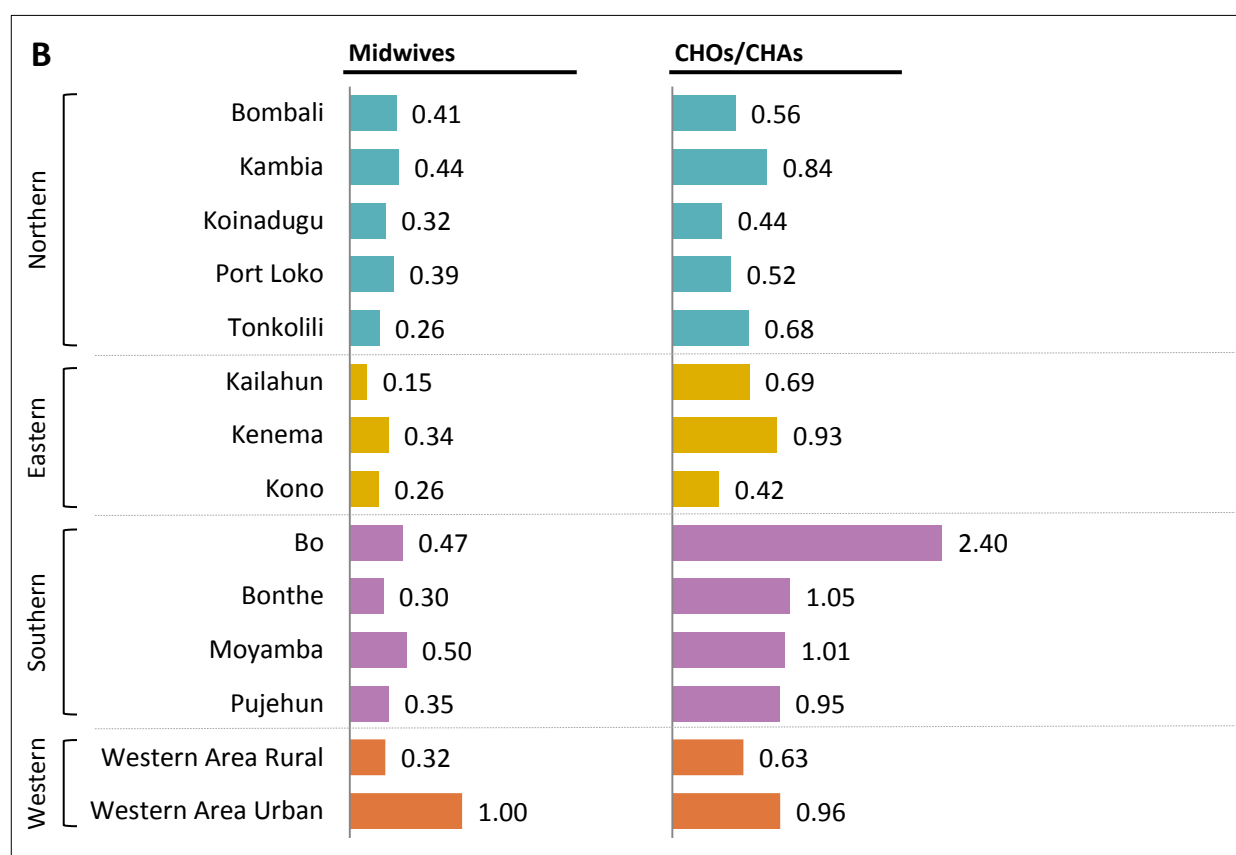
In aggregate, the concentration of the health workforce in urban areas is significantly more prominent in comparison with the concentration of the total population in urban areas as shown below in Figure 11.

Figure 11: Urban vs. rural distribution of the health workforce compared to population[13]
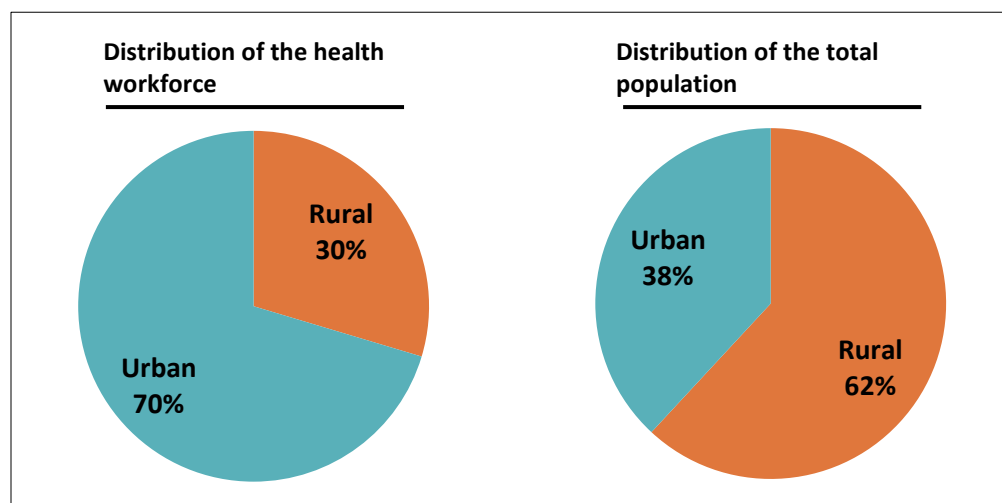
The concentration of health workers, particularly highly-skilled clinical staff, in urban areas corresponds with the general availability of advanced care, as all tertiary referral hospitals are located in Freetown and all secondary hospitals are in urban district capitals. Given the limited scope and efficiency of the current referral system, however, this distribution implies a disparity of access to health care throughout the country.

Facility type/service level

The majority of the health workforce is facility-based, with 83% working at facilities and 17% at administrative offices and training institutions. More than half of facility-based health workers are working in hospitals, as shown below.

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[13] Urban/rural distribution of the total population is from the 2004 Population and Housing Census by Statistics Sierra Leone, as the preliminary results of the 2015 census do not include the urban vs. rural breakdown

Figure 12: Distribution of the health workforce by facility type (n=9,910)
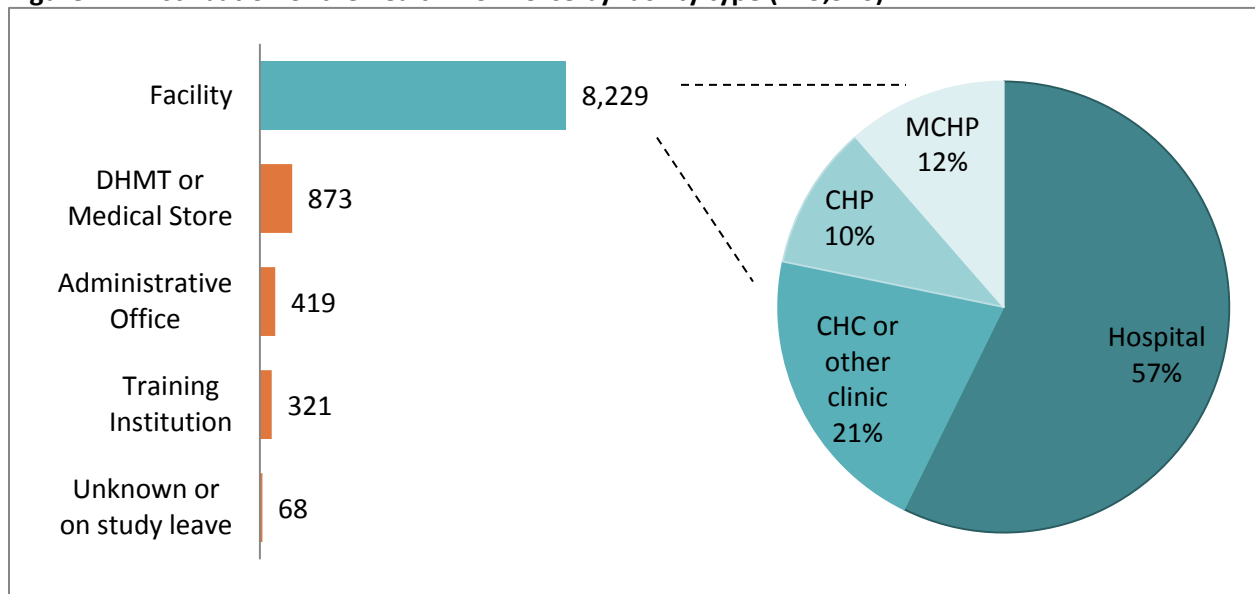
At the facility level, nearly three quarters of the total health workforce is distributed across only 10% of facilities (Figure 13). Further, 12% of the workforce is active in only three hospitals in Freetown: Connaught, Princess Christian Maternity Hospital (PCMH) and Ola During Children's Hospital (ODCH). The concentration of health workers in large, urban hospitals again points to a disparity of access to care for Sierra Leoneans living in rural areas that cannot travel to Freetown to seek health services.

Figure 13: Distribution of the health workforce across facilities
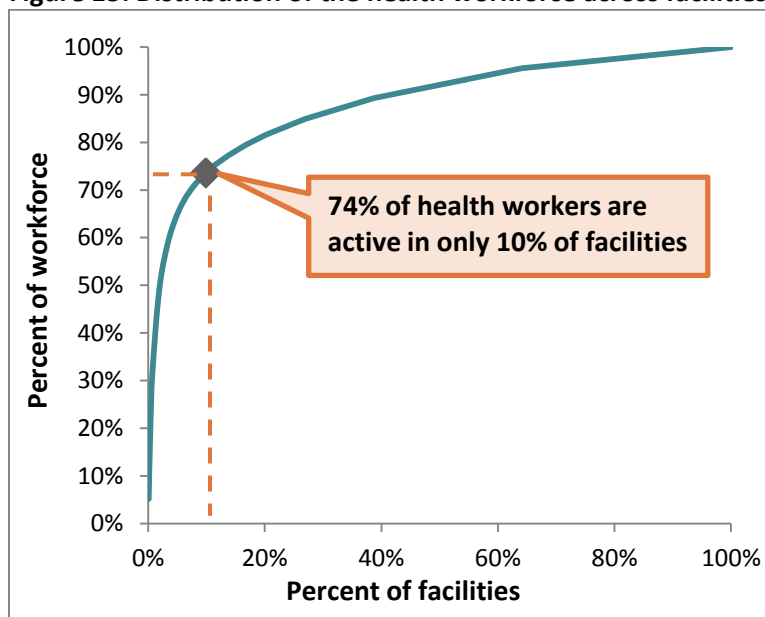
The concentration of health workers in hospitals is most pronounced in medical officers and specialists. However, this skew toward hospitals exists even for SECHNs, a cadre primarily intended to provide nursing services at the community level. The high proportion of SECHNs working in hospitals supports anecdotal claims that lower-skilled nurses often fill staffing gaps created by a shortage of higher-skilled nurses. Similarly, MCH Aides are defined in the *BPEHS 2015* to work only at the community level in PHUs, yet five percent are practicing in hospitals (Figure 14). This shift of community-based cadres to

hospitals has been difficult to address due to workforce management challenges further discussed in section 6.

Figure 14: Distribution of the health workforce across facility type by cadre
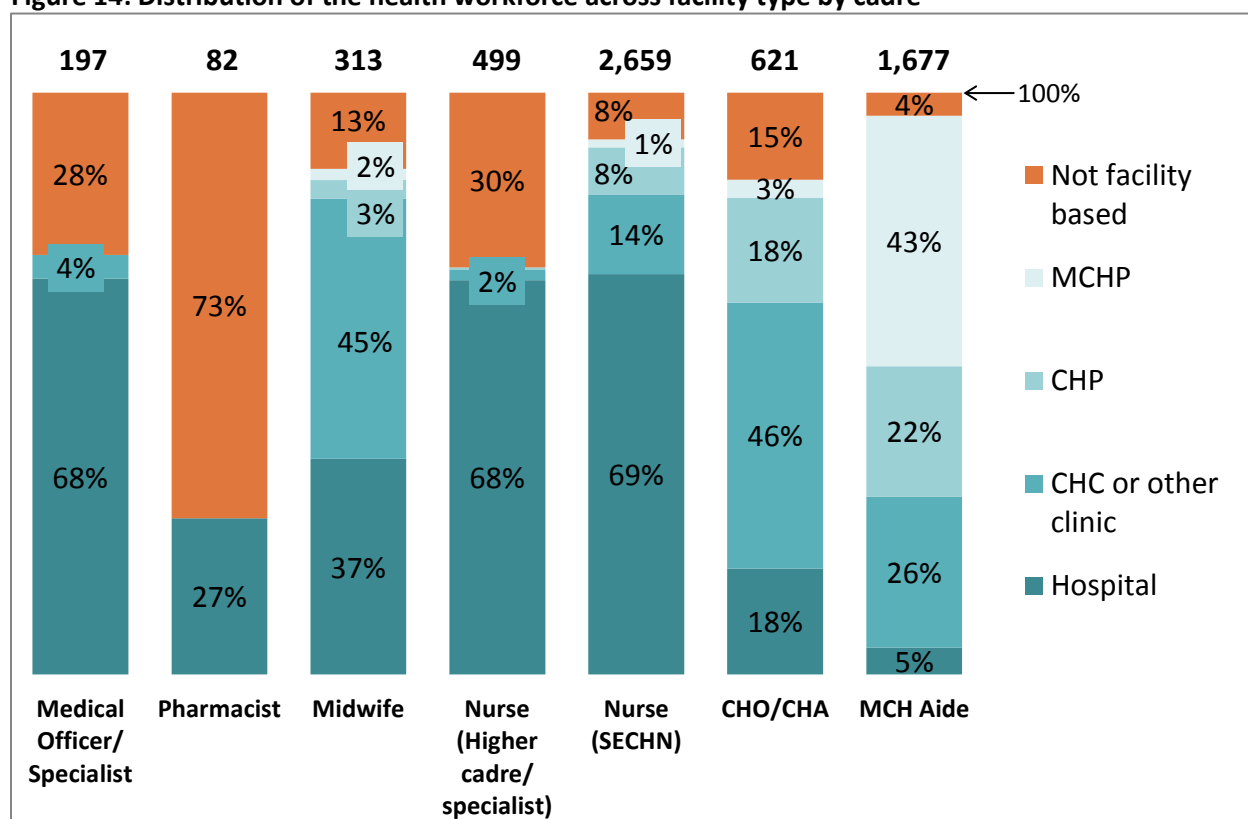
In addition to the overall concentration of health workers in hospitals, staffing gaps, defined as difference between currently active health workers and BPEHS staffing norms, are greater for PHUs than for hospitals. The staffing gaps also greatly vary between cadres, with the highest gaps seen for highly-skilled cadres across all facility types. Since there are no staffing norms for administrative offices or medical stores, gaps for cadres that are often active in such workstations, such as pharmacists, are higher at the facility level than aggregated to the national level. The average percentage of facility staffing norms met by cadre for each facility type is presented in the figure below.

Figure 15: Percentage of staffing norms met at government facilities, by cadre

	SRN	SECHNs	CHO/CHA	Midwife	Med. Officer	MCH Aide	Pharmacist/ Pharm Tech	Lab Tech/ Assistants	Total staffing as % of norm
MCHP	0	0	0	0	0	◑	0	0	**17%**
CHP	0	◕	◕	◔	0	◑	0	0	**18%**
CHC	0	◕	◕	◔	0	◑	○	◔	**25%**

	SRN	SECHNs	CHO/CHA	Midwife	Med. Officer	MCH Aide	Anesthetist	
Secondary Hospital	◔	●	● (>100%)	◕	◔	● (>100%)	◔	**48%**

	Pharmacist/ Pharm Tech	Specialist Nurse	Nursing Officer	X-ray technician	Radiology Assistant	General Surgeon	Lab Tech/ Assistants	
	◕	◔	◔	◕	◔	◔	● (>100%)	
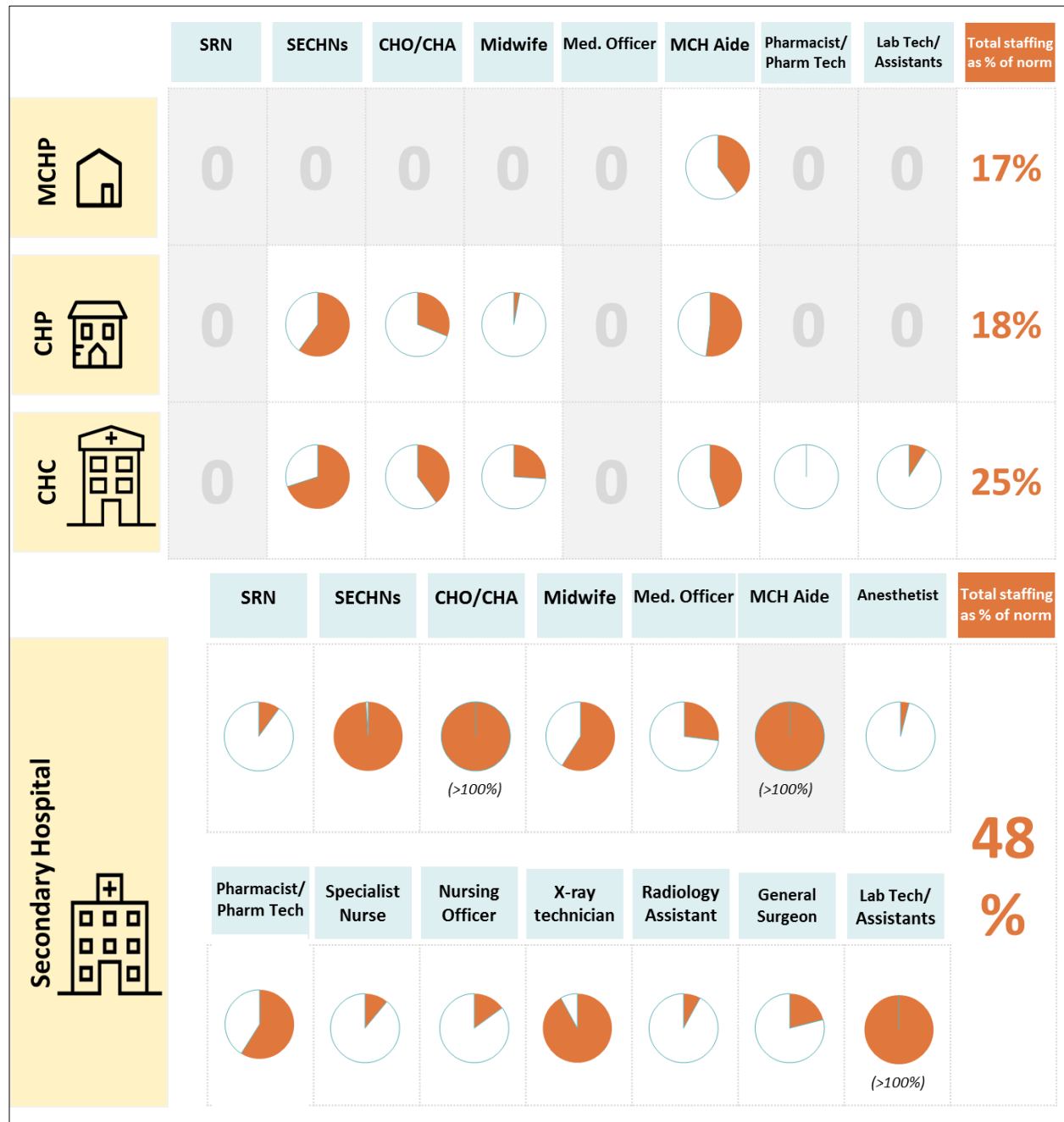
The Unsalaried Workforce

The unsalaried workforce is roughly the same size as the MoHS-employed workforce (9,120), but consists of a higher proportion of untrained support staff and lower skilled clinical workers, such as SECHNs and MCH Aides. The geographic distribution of the unsalaried workforce is roughly equal to the MoHS workforce, with 25% concentrated in Freetown and the majority active in facilities.

Breakdown by cadre *(based on self-reported designations)*

Cadre	Count
Support staff	4,221 (46%)
Nurse (SECHN)	2,261 (25%)
MCH Aide	774 (8%)
Nursing Aide	678 (7%)
Administrative staff	402 (4%)
Laboratory Technician	147 (2%)
Community Health Officer/Assistant	146 (2%)
Other Laboratory Staff	117 (1%)
Other Allied Health Professional*	102 (1%)
Nurse (Higher cadres)	70 (1%)
Environmental/Public Health	41 (<1%)
Dentistry	12 (<1%)
Nurse Specialist	7 (<1%)
Medical Officer/Specialist	6 (<1%)
Pharmacist	4 (<1%)
Midwife	3 (<1%)
Unknown	129 (1%)

*Includes nutrition cadres, rehabilitation cadres, optometry cadres, orthopaedic cadres, health counselors, medical equipment technicians, radiographers

Are the unsalaried clinical workers proven qualified health professionals?** *(for select health professional cadres)*

■ qualified   ■ unqualified

CHO   CHA   Lab Tech

SRN   SECHN   MCH Aide
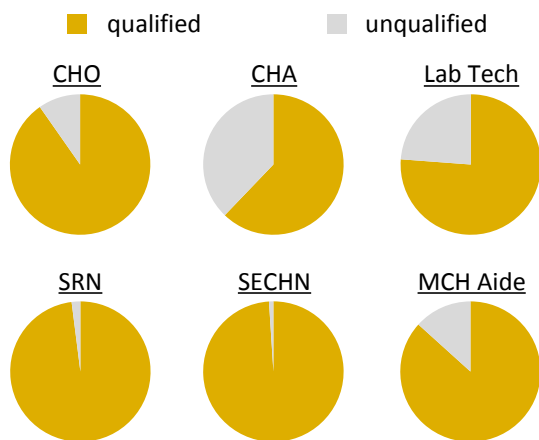
**determined by the ability to show documentation of health training program completion or professional license during the 2016 MoHS payroll verification

Distribution by facility type

Not facility based*** 7%
Hospital 38%
MCHP 20%
CHP 16%
CHC or other clinic 19%
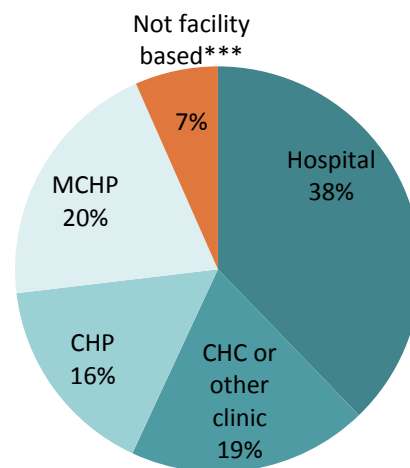
***Non-facility based unsalaried workers are primarily active at DHMTs

Future projections

An overall gap of 6,903 health professionals currently exists between BPEHS staffing norms and the current clinical workforce. Based on estimated rates of current health worker production, absorption and attrition, and assuming facility staffing norms remain the same, the government health workforce will increase to roughly 11,000 health workers in 2025 (the methodology for these projections, including assumptions and limitations, is outlined in Annex D). The government health workforce will thus fall short of BPEHS staffing norms by over 2,800 health workers in 2025.

Figure 16: Health workforce projection for all clinical workers
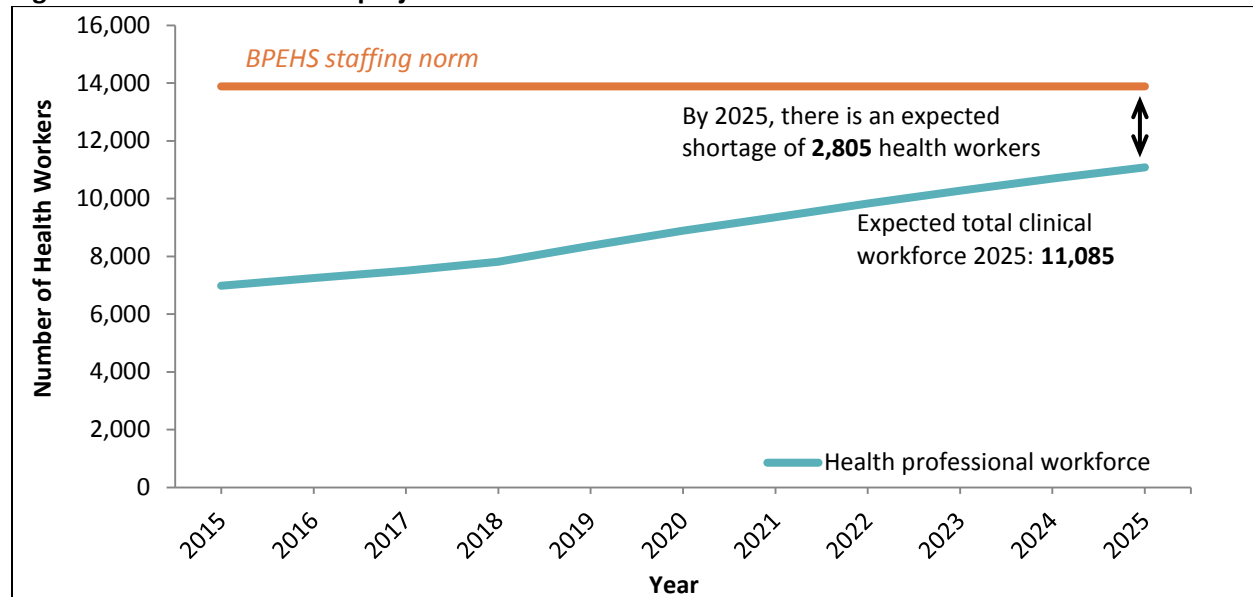
Projections show that staffing gaps will be most critical for higher cadre nurses, medical officers and midwives:

Figure 17: Higher cadre nurse and specialist nurse workforce projection
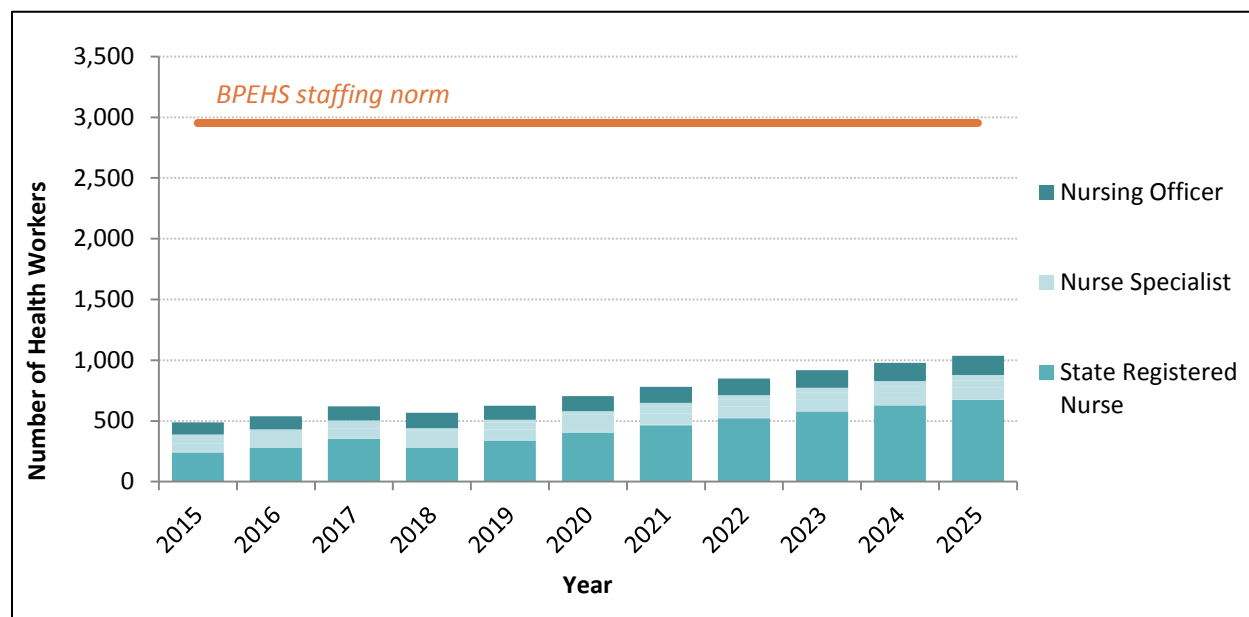
Figure 18: Medical officer workforce projection[14]
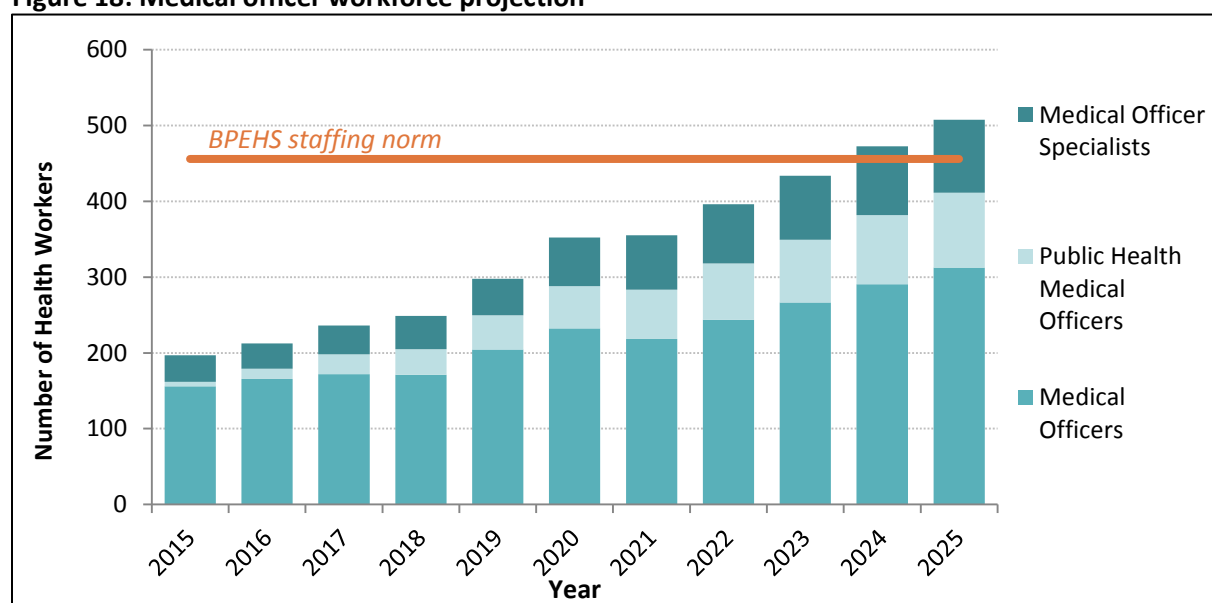
Moderate growth is expected for midwives, with projections showing staffing targets met within the next ten years, under the assumption that a new midwifery technician school is built as planned.[15] Further, midwife staffing gaps could be closed by 2025 if all new graduates (including midwives as well

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[14] Projection takes into account the post-graduate medical specialist training program, which will begin in 2016 under the West African Postgraduate Medical College

[15] The curriculum for this program is currently in development and these projections therefor do not differentiate between midwives and midwife technicians, although the pre-service training for the latter will be slightly shorter.

as midwife technicians) are immediately recruited into the public workforce (Figure 19). All existing midwifery courses in Sierra Leone are upgrading programmes that accept students practicing as SECHNs or SRNs.

Figure 19: Midwifery workforce projection
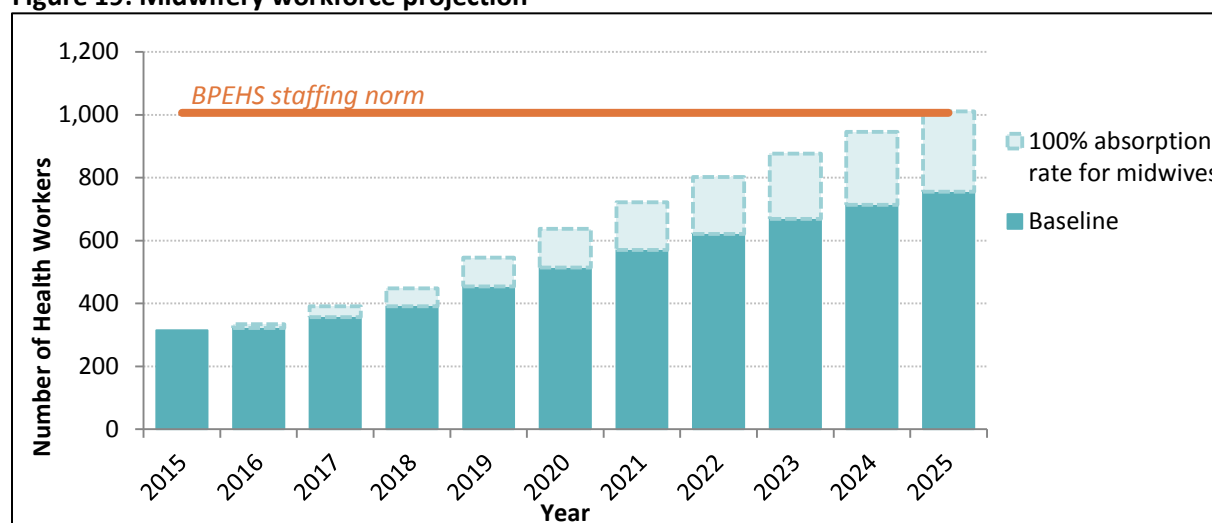
For the other cadres, moderate growth is projected at current production, absorption and attrition rates. The number of pharmacists is predicted to grow by 108%, from 82 to 171 pharmacists, by 2025, while the number of community health officers will increase by 42% from 414 to 589 CHOs by 2025. Though staffing targets for lower cadre nurses have already been met, the number of SECHNs is projected to continue to grow by 67%, from 2,659 to 4,432by 2025 if current rates of production remain constant (also taking into account that midwifery programs draw from the pool of SECHNs).

Critical challenges to address in strategy development

Though there have long been anecdotal reports of the significant number of unsalaried health workers providing services in government facilities, the MoHS now possesses data indicating the approximate number and qualification of these workers. The HRH strategy should thus include a clear policy statement to address these unemployed, and thus unregulated, health workers.

Further, the longer-term potential for integrating CHWs with the greater health workforce and the civil service should be discussed to ensure optimal utilization of available human resources.

The overall shortage of qualified health professionals in Sierra Leone will need to be addressed with respect to specific cadre needs and production capacities. The need for more midwives, for example, is particularly urgent, as Sierra Leone has one of the highest rates of maternal mortality in the world (World Health Organization, 2015). Similarly, increasing the number of SRNs and other higher cadre nurses in the workforce should be prioritized based on the current shortage and low projected growth described in Figure 17.

For lower cadre nurses, significant growth is projected despite the fact that staffing targets have already been met. Redirecting production resources to cadres with persisting personnel gaps, like the aforementioned midwife and SRN groups, will allow for a more needs-based prioritization of resources. Aside from the misuse of limited resources, the overproduction of SECHNs has led to a significant rate of unemployment for these nurses: roughly 2,000 unsalaried, licensed SECHNs were found to be practicing in government facilities during recent data collection activities. The coexistence of SRN shortages with

SECHN unemployment highlights the need for better coordination of pre-service training plans with MoHS health worker production needs.

Finally, the uneven distribution of the health workforce across and within districts should be addressed through a concerted inter-ministerial effort during strategy development to increase equity of access to health care.

5. Health Educational System

Pre-service training

Sierra Leone's pre-service health education system is governed by the MoHS and the Ministry of Education, Science and Technology (MEST), along with health regulatory boards and councils. Schools are financially supported by MEST, and often operate with limited input from MoHS. No national health training plan exists, resulting in poor alignment of health worker production with government needs and absorption capacity. National regulatory entities are responsible for accreditation of training institutions, though given resource challenges, many schools operate without accreditation.

Given the lack of national standards, curriculum development is often managed by individual schools, although nurse training programmes have curricula guidelines and standardized entrance and introductory exams set forth by the Nurses and Midwives Board. For academic programmes, curricula are developed by the universities and approved by the Tertiary Education Commission (TEC). The University of Sierra Leone, which comprises Fourah Bay College (FBC), the College of Medicine and Allied Health Sciences (COMAHS) and the Institute of Public Administration and Management (IPAM), has a curriculum committee that develops curricula for their programs and includes the MoHS Director of Training and Research.

Following matriculation, licensing exams are administered to students by three major professional councils and boards – the Medical and Dental Council, the Nurses and Midwives Board and the Pharmacy Board – meaning training programs for these cadres are at minimum aimed at preparing students to pass licensing exams.

Health training institutions are often underfunded and face shortages of qualified educators, classroom materials and adequate infrastructure. Across Sierra Leone, there are a total of 25 health training institutions providing 56 different programmes, from certificate to Master's level. Among the largest programmes are the SECHN certificate courses with roughly 900 cumulative new graduates per year, while the medical officer program in comparison produces about 40 new graduates per year.

Table 3: Overview of health training programmes in Sierra Leone

School	Programme	Funding
Blue Shield School of Nursing, Freetown	SECHN Certificate	private
COMAHS	Medical Degree (MBBS)	government
	Medical Laboratory Science Diploma	
	BSc in Medical Laboratory Science	
	Mental Health Certificate (SECHN upgrade)	
	Mental Health Diploma (SRN upgrade)	
	BSc in Nursing	
	Nursing Diploma (SRN)	

School	Programme	Funding
	Midwifery Education Diploma	
	Nursing Education Diploma	
	Ophthalmic Nursing (SECHN upgrade)	
	Ophthalmic Nursing (SRN upgrade)	
	SECHN Certificate	
	MSc Basic and Pharmaceutical Sciences	
	BSc in Pharmacy	
	Pharmacy Technician Diploma	
	MSc in Public Health (MPH)	
	Tropical Medicine and Community Health Diploma	
Defence School of Nursing, Freetown	SECHN Certificate	government
Eastern Polytechnic, Kenema	Public Health Diploma	government
	Medical Laboratory Science Diploma	
	Nursing Diploma (SRN)	
	SECHN Certificate	
Mattru School of Nursing, Mattru Jong	SECHN Certificate	private
MCH Aide training center - Bo	MCH Aide Certificate	government
MCH Aide training center - Bombali	MCH Aide Certificate	government
MCH Aide training center - Bonthe	MCH Aide Certificate	government
MCH Aide training center - Clinetown	MCH Aide Certificate	government
MCH Aide training center - Kailahun	MCH Aide Certificate	government
MCH Aide training center - Kenema	MCH Aide Certificate	government
MCH Aide training center - Koinadugu	MCH Aide Certificate	government
MCH Aide training center - Kono	MCH Aide Certificate	government
MCH Aide training center - Port Loko	MCH Aide Certificate	government
MCH Aide training center - Pujehun	MCH Aide Certificate	government
MCH Aide training center - Tonkolili	MCH Aide Certificate	government
MCH Aide training center - Waterloo	MCH Aide Certificate	government
Nixon School of Nursing, Segbwema	SECHN Certificate	private
Njala University College	Community Health Ordinary National Diploma (CHA)	government
	Community Health Higher National Diploma (CHO)	
	Post-graduate Diploma in Ophthalmology (CHO Upgrade)	
	Post-graduate Diploma in Public Health	
	BSc in Public Health	
	MSc in Public Health (MPH)	
	Environmental Health Diploma	
	BSc in Nursing	

School	Programme	Funding
	Nursing Diploma (SRN)	
	SECHN Certificate	
Northern Polytechnic School of Nursing, Makeni	SECHN Certificate	government
PCMH - National School of Midwifery	Midwifery Certificate	government
PCMH - Anaesthesia Programme	Anaesthetic Nursing Certificate (SECHN upgrade)	government
PCMH - Anaesthesia Programme	Anaesthetic Nursing Diploma (SRN upgrade)	
Redeemers School of Nursing, Freetown	SECHN Certificate	private
School of Midwifery, Makeni	Midwifery Certificate	government
St. John of God Nursing School, Mabesseneh Lunsar	SECHN Certificate	private
Tonkolili District College	Diploma in Surgical and Obstetrical Emergency Care (CHO Upgrade)	private
	SECHN Certificate	

In-service training and Continuous Professional Development

There are currently no national guidelines for in-service training or continuous professional development (CPD). Thus, any training beyond pre-service training is at the discretion of hospital and DHMTs and their partner NGOs.

Critical challenges to address in strategy development

The HRH Strategy development process will need to include development of a national training plan. Representatives from the MoHS, MEST, the Ministry of Finance and Economic Development (MoFED) and health training institutions will need to coordinate throughout the strategic planning process, as improving coordination between MoHS and these entities will be crucial in establishing a system in which resources are prioritized to produce the most critically needed health worker cadres. Key training actors should address the strengthening the accreditation system, as well as the lack of a structured plan for in-service training and CPD. The current lack of institutional structures governing in-service training and CPD allows for potential regional disparities in training opportunities, which may negatively impact health worker satisfaction, motivation and future career progression opportunities.

While needs assessments and recent data collection efforts have identified several cadres with critical personnel gaps, specific training bottlenecks should be further investigated in parallel with the strategic plan development. For example, one such bottleneck for expansion of training programmes is a lack of qualified full-time educators. However, increasing the training capacity of higher-skilled health technical programmes such as health education requires a larger pool of qualified incoming students, which is an issue beyond the scope of MoHS. MoHS should therefore work in partnership with MEST to identify these critical bottlenecks and subsequently develop intervention plans.

6. Workforce Management and Regulation

HR planning

The manpower planning process is the annual process by which the MoHS HR Directorate identifies the ministry's staffing needs, for both new positions and promotions, for the upcoming year. The plan is developed and costed over the course of three months based on formal and informal staffing needs assessments compiled from all other MoHS Directorates. This plan then serves as the basis for a budget hearing at MOFED, which ultimately determines national resource allocation to the MoHS wage bill.

Throughout the planning process, a series of documents are prepared that include the following pieces of information:

- Current staff strength, including any outstanding vacancies
- Health workers who will become eligible for retirement in the upcoming year (aged 60 years and above)
- Proposed new positions for posts on the current establishment list
- Proposed new additions to the establishment list
- Proposed promotions to be offered in the coming year and the resulting impact on the wage bill

The efficiency and accuracy of the manpower planning process has historically been impeded by a lack of availability of accurate health worker data. Improving health worker data availability and quality has been a major aim of the DHRH over the past year and remains a key first step in improving the manpower planning process to be more evidence based.

Recruitment and deployment

Roles and responsibilities

Responsibility for recruitment and deployment of health workers is split across several entities: the civil service's Human Resource Management Office (HRMO), the Health Service Commission (HSC), the DHRH and various professional directorates within MoHS. These bodies are each accountable for different steps of the process. To begin recruitment, DHRH announces vacancies for positions established by the annual manpower plan. Next, HSC interviews and selects the qualified candidates and forwards candidate information back to HRMO to formalize the recruitment.

DHRH must then collaborate with the relevant professional directorate to determine health worker postings: the Directorate of Nursing Services for nursing and midwifery cadre postings, the Office of the Chief CHO for CHO and CHA postings, the Office of the CMO for medical officers and specialists, and so on. After initial posting, a health worker can be transferred at the discretion of the supervising DHMT if intra-district and DHRH if inter-district.

Recruitment capacity

Formally trained health workers are generally recruited into the workforce within a year of graduation. However, recruitment is sometimes further delayed due to insufficient resources for health worker salaries (see section 7). Recruitment delays are especially common for lower-skilled nurses, as current production rates far exceed the absorption capacity of MoHS.

Deployment efficiency

Recent data collection efforts show that the health worker data available at the central level of the MoHS previously contained inaccuracies, particularly with regards to workstation information. As a

result, the concentration of health workers in hospitals and urban areas is more significant than previously understood. Anecdotal evidence suggests that this is caused by a lack of decentralization, leading to a combination of poor record keeping, ineffective communication between district level and national level MoHS, informal transfer processes and unsanctioned transfers initiated by health workers. In addition to emphasizing the uneven geographic distribution of the health workforce, this finding also highlights the inadequacy of ongoing deployment decisions, since these are currently based on data available at the national MoHS level and not supplemented with a national deployment policy.

Professional regulation

There are three health professional regulatory bodies in Sierra Leone: the Nurses and Midwives Board for all nursing and midwifery cadres, the Medical and Dental Council for all medical officers, specialists and dentistry cadres and the Pharmacy Board for pharmacists. These three regulatory bodies are responsible for accrediting health training institutions and licensing health professionals belonging to the represented cadres. However, health professional regulatory bodies are under resourced, making the licensing process challenging to enforce and monitor.

There are no other cadres in the health workforce with responsible regulatory bodies. This means that none of the allied health professional cadres have a means of licensing or other quality assurance practices. Research shows that a lack of regulatory body for CHOs and CHAs in particular is demotivating to health workers within these cadres (Wurie & Witter, 2014).

Remuneration and sanctions

MoHS employed health workers may receive up to two forms of remuneration from the government: salary and performance-based financing (PBF). Additionally, some health workers receive separate incentives from partners and other health sector stakeholders for a variety of purposes outlined in this chapter.

In contrast, unsalaried health workers receive no formal remuneration paid by the government. These workers may rely solely on other sources of income, including incentives paid by NGOs or other implementing partners and informal patient user-fees.

MoHS salary

Salary amounts are paid in accordance with salary grades, which were defined for technical health professionals with the introduction of the FHCI in 2010. For administrative cadres and support staff, designations and grades are structured in accordance with the open civil service structure. As an example, the average salary for medical officers is LE 6,402,000 and nurses earn on average LE 1,626,000. HRMO is responsible for issuing health worker salaries through bank transfers.

Performance-based financing

A performance-based financing programme was introduced in Sierra Leone in 2011 to increase the quality of health care provided under the FHCI by financially offsetting the removal of user-fees for pregnant and lactating women and children under five. Funded by the World Bank, the programme provides finances with the aims to:

- Provide cash at facility level to cover the local costs of delivering services and removing the need for 'informal' fees
- Provide financial incentives to facilities in order to increase productivity and quality of care, especially for the identified key indicators

- Increase the equity of distribution of resources with funds from PBF allowing facilities to hire contractual workers and finance outreach activities (GoSL, 2011).

The PBF programme is primarily focused at the PHU level, but extends to Princess Christian Maternity Hospital and Ola During Children's Hospital due to the high prevalence of maternal and child mortality in Sierra Leone. The PBF scheme allocates up to 60% of funds to supplement payments to technical health staff, while at least 40% must be invested back in the facility for operational costs, including the payment of non-technical staff (Oxford Policy Management, 2015).

The PBF programme never reached its full potential for incentivizing quality of care due to significant delays in payment. As payments take up to one year at the PHU level, PBF is not received as intended as a direct reward for quality services delivered. An external evaluation of the programme in 2014 showed that roughly 12% of patients were still charged user-fees one year after the programme launched (Cordaid, 2014). The evaluation highlighted strengths of the PBF programme such as great attention to facility cleanliness, better availability of medicines, and increased data quality. Increasing availability and expediency of funds could improve the impact of these positive outcomes.

External research indicates that the scheme indeed motivates health workers, who reported feeling that the government was increasingly valuing their work. The delayed payments were described as nuisance, but the irregularity led to it being an unplanned windfall for health workers, thus allowing for health workers to spend the funds without demands from dependents (Witter, Bertone, Wurie, Edem-Hotah, & Samai, 2014). Absent other forms of direct financial incentives, the scheme has proved a successful motivator to health workers.

Funding for the current PBF scheme expires in October 2016. At the time of report writing, there was no exit strategy or plan to continue the programme.

Remote area allowances

There is currently no structure in place to provide incentives for health workers to work in rural areas. The previous remote area allowance programme funded by the Global Fund was discontinued in mid-2012 due to implementation challenges, particularly poor personnel data management. Existing payroll and attendance monitoring systems were not robust enough to ensure health workers receiving remote area allowances were truly reporting for duty in their rural facilities.

Studies have described clear financial disincentives to work in rural areas, including elevated transport costs and the common need for health workers to secure accommodation in more than one location (Witter, Bertone, Wurie, Edem-Hotah, & Samai, 2014). A rural incentives plan should thus be revisited as personnel management processes are improved.

Other incentives

In addition to government salary, PBF and remote area allowances, health workers may receive compensation through a variety of informal avenues, including salary top-ups, daily service allowances (DSA), charging user-fees or accepting gifts.

Figure 20 below provides an overview of the role these incentives play in health workers' total income (Witter, Bertone, Wurie, Edem-Hotah, & Samai, 2014). As shown, salary payments make up over 80% of doctors' total income, while lower cadres such as MCH Aides rely on informal incentives for up to 40% of their total income.

Figure 20: Breakdown of sources of total income, by designation
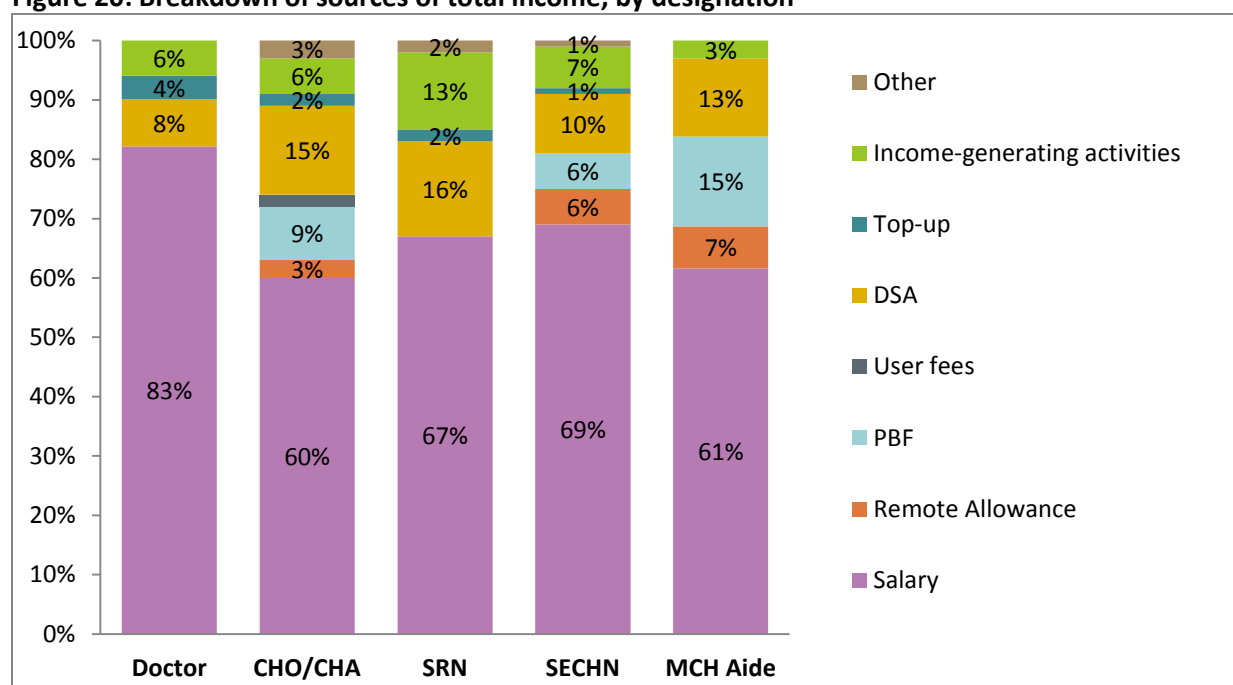
Sanctions framework

There is currently a sanction framework linked to personnel status changes reported through the attendance monitoring system. Facility in-charges are responsible for reporting when a health worker is absent from his or her duty station without authorization for more than six days in a month. In-charges then report this information to the district monitoring and evaluation officer, who reflects the health worker's status change in the attendance monitoring system. If a health worker is reported to not be working more than six days in one month, pay will be frozen the following month. The health worker may then have his or her salary unfrozen once attendance improves.

Insufficient resources, however, have made enforcement of the sanctions framework challenging. Recent data collection highlighted limitations to the effectiveness of this system, as a number of inactive health workers were found on the MoHS payroll through the recently finalized payroll audit.

Further, personnel data collected through the payroll audit showed roughly 3,350 health workers to be active in facilities other than where they appear in the attendance monitoring system, including 495 health workers for whom no location information was available in the attendance monitoring system. This finding indicates a need to refine the existing sanctions framework to better enforce duty postings.

HR Information system

The HR Directorate has recently made significant progress in increasing availability and quality of health workforce data. As of early 2016, the Human Resource Information System (iHRIS) was fully populated, and the communication system mHero was introduced. Additionally, the MoHS payroll was cleaned to ease the fiscal burden of a significant number of inactive health workers. In this same period, the MoHS attendance monitoring system was updated by the DHRH and partners. The attendance monitoring system uses the most current HRH data as a baseline and allows for monthly reporting of personnel updates on place of work, staff movements, attendance and leave taken, as described in the section above.

There is additional ongoing work within the MoHS to achieve broader interoperability between health information systems, including DHIS, iHRIS, the payroll database managed by HRMO and the MoHS attendance monitoring system.

Critical challenges to address in strategy development

Improved data availability as a result of the aforementioned activities to update information systems should now be used to enable more evidence-based health workforce planning, including annual planning, recruitment and deployment decisions and training planning. The MoHS will need to strengthen enforcement of existing management processes, such as the sanctions framework, so that new workforce data is fully utilized. Similarly, as information system infrastructure is strengthened, the MoHS has an opportunity to revisit management strategies that were not previously possible, such as rural incentive programmes. To facilitate more efficient workforce management and maintenance of information systems, the MoHS plans to decentralize HRH management functions to allow greater ownership of the payroll and attendance monitoring systems at the district level. The structure and longer term plan for this change will need to be further detailed through the strategy development process.

Finally, the issue of professional regulation should be addressed for each cadre during strategy development, particularly for the allied health cadres for which there are currently no regulatory bodies, such as CHOs, CHAs and laboratory scientists.

7. Workforce Financing

Current costs

The budget for the MoHS wage bill is roughly 43.7% of the civil service wage bill budget and 8.6% of the total GoSL wage bill budget, and amounts to approximately 21.2 million dollars a year (Government of Sierra Leone, 2014).[16]

In accordance with the concentration of health workers in Freetown and other urban areas, 63% of the MoHS wage bill is spent either Freetown or one of the other three regional capitols: Bo, Kenema and Bombali (Figure 21).

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[16] Calculated based on MoHS February payroll

Figure 21: Percent of MoHS wage bill spent in each district

District	Percent
Western Area Urban	41%
Bo	9%
Kenema	7%
Bombali	6%
Western Area Rural	5%
Port Loko	4%
Moyamba	3%
Kono	3%
Tonkolili	3%
Kambia	3%
Kailahun	3%
Koinadugu	3%
Pujehun	2%
Bonthe	2%
Study leave	2%
Unknown	4%
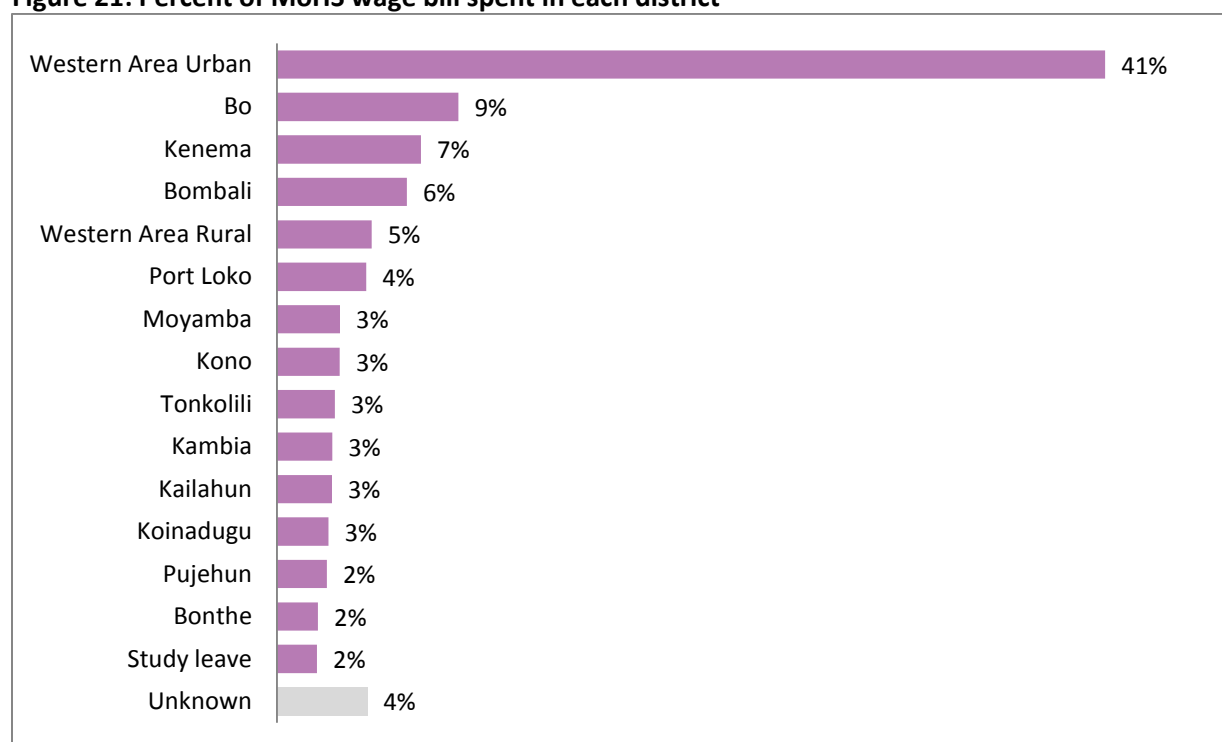
Approximately 88% of the wage bill funds the salaries of health professional cadres, while 12% funds administrative and support cadres.

Future costs

The increase in the MoHS wage bill over the next ten years can be roughly estimated based on the workforce growth projections presented in section 4. These growth projections indicate that the wage bill for the health professional cadres will increase by 94%, hence nearly doubling over the next five years, at the current rate of production, absorption and attrition (Figure 22).

Figure 22: Ten year projection of the total payroll for clinical cadres (in USD)[17]
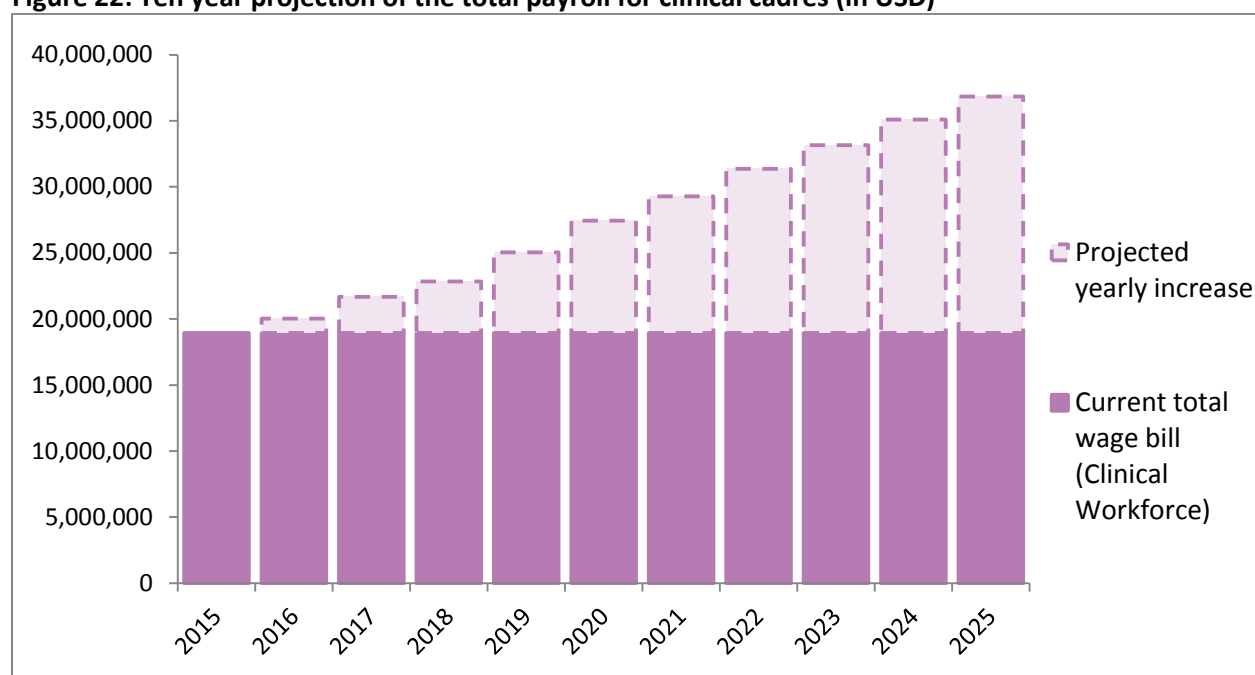
Funding

The introduction of the Free Healthcare Initiative saw a doubling of health worker salaries, with partners paying up to 50% of the total wage bill. The plan was to phase out wage bill support by 2015, but this was not completed. Both DFID and Global Fund are still contributing to the health worker wage bill. The Global Fund has committed USD 8.4 million over the next two years (2016-2017), while DFID has earmarked GBP 20 million of their financial aid to government for health worker salaries. Both commitments are only disbursed upon achieving performance indicators and both act as reimbursement, which means that government has to pre-finance the salaries and may be paid back if certain indicators are achieved. There are no currently known commitments beyond 2017. Apart from the support to the wage bill, partners are supporting training institutions directly and also provide funding for various in-service training programmes. Partners also support salary top-up schemes, such as PBF or training per diem schemes.

The MoHS advocates annually through the manpower planning exercise conducted by the HRMO for an increase in the health wage bill. The MoHS internal planning processes have been increasingly institutionalized over the last planning cycles, with consultations reaching into the districts and hospitals.

There is no budget ceiling attached to the HRH planning process, leading to significant cuts made after workforce hiring plans are completed. MoFED issues frequent hiring freezes due to lack of funds. There is a lack of communication and coordination between revenue forecasts, medium-term expenditure planning and health worker wage bill projections, which leads to disjointed planning processes not

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[17] Note: Clinical workforce includes all nurses, midwives, physicians, CHA/CHOs, MCH aides, pharmacy, laboratory and environmental health workers

based on available fiscal space. In addition, revenue generated within MoHS is not strategically planned for or incorporated into HR planning processes.

The long term capacity and willingness of the government to pay for health services and health workers depends largely on the overall situation of the economy. The medium-term expenditure framework of the GoSL for the MoHS wage bill states no increase over the next three years, which indicates that the only other way of allowing new workers to join civil service would be to allow efficiency gains through voluntary or involuntary attrition.

Additionally, GoSL pays tuition fees for medical students abroad because postgraduate training was not available in country before 2016. Most other programmatic expenses related to HRH are supported by partners.

The HRH strategy development process has prioritized addressing the lack of inclusion of revenue planning and management, as well as long term financial sustainability of the health wage bill. This comes with challenges such as the CHW programme, which plans to integrate the CHW workforce into general government, as well as better coordinate the planning of fiscal space and production of health care workers. The lack of the latter has in the past resulted in an increase in the number of volunteers at public facilities. The multiyear HRH strategy will suggest outcomes and activities to improve the financing and planning of the health workforce.

8. Annexes

Annex A: Facility staffing norms from the Basic Package of Essential Health Services 2015

MCHP STAFFING NORMS

Cadre	Number	Comments
MCH Aide	3	To be trained as vaccinators and as psychosocial counselors
Porter/Cleaner	1	
Security	1	
GRAND TOTAL	**5**	

CHP STAFFING NORMS

Cadre	Number	Comments
Community Health Assistant	1	
SECHN	1	To also play role of IPC Officer
MCH Aide	2	To be trained as vaccinators and as psychosocial counselors
Midwife	1	Possible direct entry, or SECHN trained in midwifery
Porter/Cleaner	2	
Security	2	
GRAND TOTAL	**9**	

CHC STAFFING NORMS

Cadre	Number	Comments
Community Health Assistant	1	
Community Health Officer	2	To be trained as psychosocial counselors
Public Health Aide	1	
Environmental Health Officer (IPC Supervisor)	1	
Lab Technician	1	
Lab Assistant	1	
Community Mental Health Aide	1	
MCH Aide	4	To be trained as vaccinators / psychosocial counselors / in basic physical rehabilitation services
Midwife	2	Possible direct entry, or SECHN trained in midwifery
SECHN (1 to serve as IPC supervisor)	2	To be trained as psychosocial counselors; 1 to be trained as IPC Supervisor
Pharmacy Technician	1	
Assistant Nutritionist	1	
Porter/Cleaner	2	
Security	2	
GRAND TOTAL	**22**	

SECONDARY HOSPITAL STAFFING NORMS

Cadre	Number	Cadre	Number
Anaesthetist	1	State Registered Nurse	12
Assistant Anaesthetist (Nurse / CHO)	3	State Registered Nurse Midwife	8
Community Health Officer	1	Theatre Nurse	18
Public Health Aide	2	Pediatric Nurse	2
Clinical Officer	6	Accident and Emergency Nurse	2
Family Physician	1	Critical Care Nurse	2
Internal Medicine Physician	1	Assistant Nutritionist	1
Medical Officers	6	Nutritionist	1
Public Health Physician	1	Dental Nursing Auxiliary / Assistant	1
Environmental Health Officer	1	Dental Receptionist	1
Infection Prevention and Control Focal Point	1	Dental Technician	2
Ophthalmic CHO	1	Dental Therapist/Hygienist/Nurse	1
Ophthalmic Nurse	4	Dental Surgeon (Dentist)	1
Optician	1	Clinical Pharmacist	1
Optometrist	1	Pharmacist	2
Health Education Officer	1	Pharmacy Technician	6
Assistant Finance Officer	1	Radiology Assistant	1
Finance Officer	1	X-Ray Technician	1
Hospital Manager	1	Physiotherapist	2
Hospital Secretary	1	Rehabilitation Worker	2
ICT Technician	1	ENT Assistant	1
Medical Records Assistant	3	Obstetrics and Gynaecology	1
Medical Records Officer	1	Paediatrician	1
Laboratory Assistant	4	General Surgeon	1
Laboratory Technician	3	Caterer	2
Medical Laboratory Scientific Officer	1	Cleaners/Labourer	20
Logistics Officer	1	Cook	6

Procurement Assistant	1	Driver	3
Clinical Psychologist	1	Hospital Maintenance Team (Plumber, Carpenter, Electrician/Electronics, Mason, Painter, Mechanic,)	5
Mental Health CHO	2	Launderer	6
Mental Health Nurses	2	Medical Equipment Technician	2
Mental Health Social Worker	1	Mortician	1
Nursing Aide	12	Mortuary Attendant	3
Nursing Officer	2	Porter	12
SECHN	12	Registration Clerk	1
Senior Nursing Officer	1	Security	12
GRAND TOTAL	**228**		

Annex B: Distribution of the health workforce by salary scale

Salary grade refers to a pay scale from 1-14, which indicates a combination of the skill-level of a health worker's formal designation and seniority. Approximately three quarters (72%) of the salaried workforce is currently in one of the bottom three grades (Figure 23).

Figure 23: GoSL-employed health workers by grade (n=9,910)
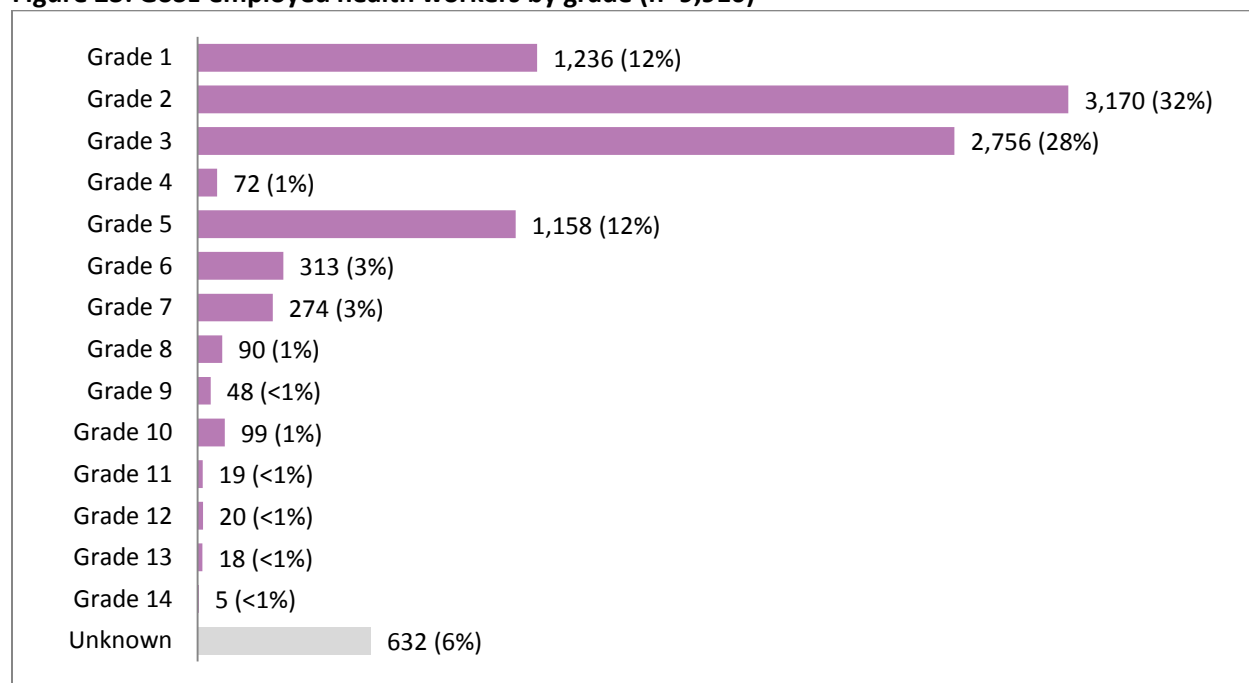
Annex C: MoHS Payroll Verification 2016 Background and Methodology

The 2016 Ministry of Health and Sanitation (MoHS) payroll audit was implemented as part of the Government of Sierra Leone's 6-9 Month post-Ebola Recovery Plan with the purpose of creating additional space in the civil service wage bill. The audit was led by the Directorate of Human Resources for Health (DHRH) of the MoHS, in partnership with the Clinton Health Access Initiative (CHAI) and local data collection firm NestBuilders International (NBI). The aims of the audit included verifying the active status of all MoHS-employed health workers; performing thorough investigations of staff who were repeatedly found absent from their duty stations during data collection; and collecting accurate personal information for all active health workers to update the payroll database.

To achieve these aims, data collection teams consisting of DHRH, NBI, and CHAI staff visited more than 1,300 workstations nationwide, including healthcare facilities, district health offices, health training institutions and MoHS-affiliated administrative offices to conduct in-person interviews with health workers. Data was collected electronically on Android phones with an open-source data collection tool. Surveys were administered to roughly 22,000 health workers found in either government facilities or private facilities with posted MoHS staff. This number is far greater than the individuals on the official MoHS payroll because the decision was taken to also collect data on unsalaried health workers who do not receive government pay, of which there are a substantial amount.

Of the 10,166 health workers on MoHS payroll at the time of data collection, 9,410 were verified as active in their posts or on authorized leave, while 756 salaried health workers were "unverified". Health workers were given an "unverified" classification after multiple follow-up visits to workstations and thorough follow-up investigation, including interviews with DHMT and/or hospital supervisory staff and reviews of personnel files at the HR Directorate of the MoHS. Reasons for an "unverified" classification included reported death/retirement, reported abandonment of post, unauthorized leave, or the health worker being unknown to facility in-charges and the DHMT. Compensation of these 756 inactive health workers amounted to a total expenditure of SLL 1,075,425,994 (USD 179,238) monthly. This is more than USD two million per year – approximately ten percent of the overall MoHS wage bill.

Following the removal of unverified workers from the payroll in June 2016, a transparent reinstatement process was set into place. The payroll steering committee was revived to review reinstatement requests investigated by the DHRH. The committee consisted of members from MoHS, MoFED, HRMO and partners. Requests recommended for reinstatement by the steering committee were further reviewed by the PS, CMO and Minister of Health and Sanitation for final approval before submission to HRMO. Following close of the reinstatement period, 428 health workers remain unverified and were removed from the MoHS payroll.

Removal of these 428 health workers has resulted in significant MoHS wage bill savings of SLL 592,223,833 (USD 98,704) monthly. This amounts to approximate annual savings of SLL 7.1 billion, or USD 1.2 million.

Annex D: Health Worker Pipeline Analysis

The pipeline analysis tool provides a quantitative approach to Human Resources for Health (HRH) strategic planning in Sierra Leone. This excel-based tool uses training, hiring and workforce attrition rates to forecast yearly public sector health workforce numbers for each cadre, relative to national workforce targets. Inputs can be modified to estimate the potential impact of policy changes or interventions, such as increasing training institution capacity or introducing policies to retain more health workers in the public health workforce. This feature is used to analyze what combinations of

interventions (e.g. changes to training, hiring and retention) will bring Sierra Leone closer to its health worker staffing norms, defined in the Basic Package of Essential Health and Social Welfare Services.
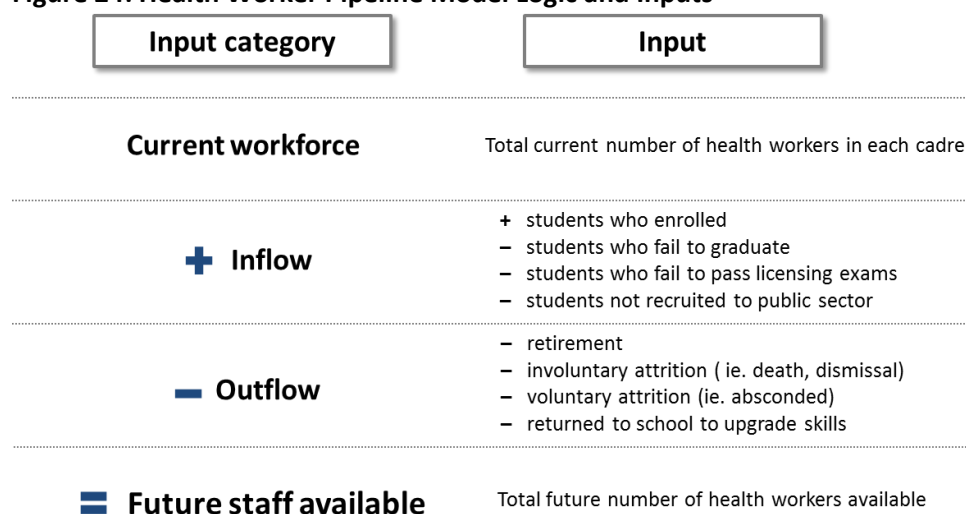
Model Methodology

The pipeline model functions as a series of calculations that estimate health workforce inflow and outflow (Figure 24). The three main inputs are A) the current size of the workforce by cadre, B) yearly health workforce inflow estimated from health training institution graduation numbers and public sector recruitment, and C) yearly health workforce outflow represented by the number of health workers lost to voluntary and involuntary attrition.

Specifically, the number of health workers lost to attrition is calculated annually as the size of the workforce for each cadre before new hires multiplied by the workforce attrition rates for each cadre. The annual inflow of staff is equal to sum of new hires from training institutions. Health worker immigration from other countries was assumed to be negligible and set to zero.

To calculate the number of new entrants to the workforce, the model multiplies together the size of the training enrollment or class that was expected to graduate that year, the estimated graduation rate, and the percentages of graduates that enter the public sector workforce.

Figure 24: Health Worker Pipeline Model Logic and Inputs

Input category	Input
Current workforce	Total current number of health workers in each cadre
+ Inflow	**+** students who enrolled **−** students who fail to graduate **−** students who fail to pass licensing exams **−** students not recruited to public sector
− Outflow	**−** retirement **−** involuntary attrition (ie. death, dismissal) **−** voluntary attrition (ie. absconded) **−** returned to school to upgrade skills
= Future staff available	Total future number of health workers available

Data Collection

Model inputs are collected from both primary (i.e. training institution enrollment and graduation rates and baseline workforce numbers[18]) and secondary data sources. (i.e. public sector recruitment and attrition estimates). Primary data collection was conducted using comprehensive training institution surveys consisting of three focus areas: (A) Students, (B) Faculty and (C) Infrastructure. The surveys sought to develop an understanding of the number and types of future health workers currently being trained as students in all relevant (degree/diploma/certificate) programmes at each institution, including the career path of the students after graduation. It also collected information to understand

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[18] Based on the 2016 MoHS Payroll Audit

each school's capacity to train more students as well as any barriers to increasing capacity (e.g., more faculty needed, not enough classrooms).

Some of the information collected included:

- Programme and curriculum details
- Number of applicants
- Historical and current student enrollment by year of entry
- Historical and current graduation rates
- Student attrition and key drivers of student drop-out
- Number of faculty and qualifications
- Faculty to student ratio
- Classroom and housing capacity
- Current or planned new construction
- Most critical needs for the institution

Secondary data sources included MoHS payroll and attendance monitoring databases, licensing board records, health worker retention literature and consultations with government, partner and training institution stakeholders.

Assumptions and limitations

Assumption	Rationale
Baseline Workforce	
33% of midwives assumed to be state certified midwives (SRN upgrades) and 67% enrolled midwives (SECHN upgrades)	*These same proportions apply to production of midwives*
Missing data was imputed using A) the average values from other years at that institution, or B) the average value from other institutions offering the same programme	*Wherever possible, school-specific data was used to impute missing values. When not available, cadre-specific data was used as an estimate.*
Workforce Inflow	
Where HTIs have no knowledge of upcoming years' enrolment, it is assumed to be similar to previous years	*Supported by Health Training Institutions*
30% of medical officers are trained abroad and return to Sierra Leone	*Estimated by DHRH*
Data from nurses and midwives board exams are similar to actual enrolment and graduation figures	*Stated by Nurses and midwives board/HTIs*
A health worker remains in the workforce while undertaking upgrading programmes	*This is common practice according to health training institutions*
Entry of foreign nationals to the workforce from other countries is negligible	*There is limited data available to quantify the number of health workers that are trained in other countries and subsequently enter the Sierra Leone public health workforce, but anecdotal reports suggest that this number is small*

For all cadres, except medical officers, 70% of successful graduates enter the public health workforce. 100% of medical officers are assumed to enter the public health workforce	*Licensing data is not complete for all cadres, but a comparison of graduation numbers against payroll data, consultation with experts and a review of data from other countries suggest that 70% is a reasonable estimate*
10% of graduates of the MPH programme are Medical Officers and 50% are State Registered Nurses. These graduates become Medical Specialists (Public Health) and Nurse Specialists	*The MPH programmes offered at COMAHS and* *Njala University College are open to qualified medical officers and State Registered Nurses*
The number of students passing licensing exams is constant within each cadre, regardless of which school the student graduated from. For example, 89% of Diploma of Nursing (SRN) graduates pass their licensing exam.	*While licensing exam pass rates may vary depending on where the student graduated from, this information was not available. Between-school variation is expected to be smaller than between-cadre variation.*
Students graduate within the expected number of years required to complete their degree programme	*It is likely that some students experience delays or interruptions during the course of their studies. These delays are not captured in the model and may lead to slight overestimates in yearly entrance to the workforce*
Graduating students that enter the public health workforce are expected to enter the workforce within twelve months of graduation.	*Recruitment time is highly variable. For simplification, the model assumes that the students graduate, pass license exams and are recruited within the same year. The model counts year as the midpoint of the calendar year.*
All BSc Nursing students are direct entry students	*There is insufficient data to distinguish direct entry and upgrading students in the BSc Nursing programme. It is estimated that the number of upgrading students in the programme is small and thus has limited impact on overall workforce projections.*

Workforce Outflow

Both voluntary and involuntary attrition rates are similar across cadres	*Insufficient data quality to determine cadre-specific attrition rates.*
Actual attrition is higher than what is observed in secondary workforce data	*Available secondary data sources showed much lower attrition rates than what is reported by stakeholders and what is seen in other countries. Current health worker tracking systems and payroll databases are not fully capturing workforce outflow.*

National Staffing Targets

BPEHS staffing norms do not change over time	*BEPHS staffing norms are provided per facility. There are currently no available plans outlining future health facility expansion. Increases in the number of health facilities, or hospital expansion, would require an increase in the number of health workers required as outlined in national staffing norms.*
When staffing norms are provided per ward, the average number of wards per hospital based on actual number of wards from a sample of hospitals known to be of different sizes	*The sample used to calculate the average number of hospital wards was found to be representative of hospitals across the country*

When staffing targets are calculated per population (e.g. internationally recommended staffing threshold for skilled birth attendants), the average yearly population growth is assumed to be 2%	This is a conservative estimate in line with estimates provided by the world bank for 2015 (http://data.worldbank.org/indicator/SP.POP.GROW)

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