



**MINISTRY OF HEALTH**  
Republic of Liberia

# **Applying the Workload Indicators of Staffing Needs (WISN) Method in Liberia**

## **NATIONAL WISN REPORT**

**Health Centers and Clinics**

**March 2022**



# LIBERIA

## WISN REPORT FOR HEALTH CENTERS AND CLINICS

Applying the Workload Indicators of Staffing Needs (WISN) Method in  
Liberia

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## FOREWORD

The 2021-2022 Workload indicator for Staffing Needs (WISN) was authorized by the Ministry of Health (MOH) and implemented by the Human Resources for Health. This study is the first of its kind in the Health System, after two unsuccessful attempts in 2016 and 2018.

The health system of Liberia has challenges with human resource training, deployment, distribution, retention and development. Liberia has a deficiency in the number of qualified health workforce (<23 core workforce per 10,000 population). In addition, the current workforce distribution is informed by the catchment population allocated to each health facility according to the level of the health system. Besides, there is a high attrition rate of healthcare workers serving in the rural areas, partly due to the absence of social amenities in these areas. This has created a wide disparity in rural: urban distribution of health workforce.

WISN is designed to provide up-to-date information on health workers and the evidence to efficiently plan and manage their day-to-day activities at the facilities. In particular, the WISN approach allows health managers, among others, to a) estimate staff required to deliver actual and expected workload at facilities, and b) understand and compare staff workload at health facilities. Therefore, the MOH started WISN since June 2021 with the support of the WHO Country office of Liberia and AFRO regional office. The WISN involved five cadres (physician assistant, nurse, midwife, nurse anesthetist, nurse aide and dispenser) in clinics and health centres. At the end of the exercise workload standards for all public health centres (36) and clinics (351) with available service delivery and human resource data were WISN.

The report presents the WISN results and the implications for the human resource planning and management in Liberia. This is a milestone in our human resource planning process as the country strives towards attaining Universal Health Coverage by 2030. I would urge all relevant actors within the Liberian health system to use these findings to inform health workforce decisions and policies, especially at this time when the government is revising its National Health Policy and Strategic Plans.

## ACKNOWLEDGEMENTS

This Liberia Workload Indicator for Staffing Needs (2021-2022) was conducted with the collaborative efforts of the Minister and her Deputies, Regulatory Boards and the WHO. The participatory process ensured inclusion of professional staff from the 15 counties. To conduct the WISN process there were three implementation groups established: 1) Steering committee, 2) Technical Task Force 3) Expert working Group. Each group had clearly defined roles and responsibilities as per its composition.

We wish to recognize the support and cooperation of the senior leadership of the Ministry of Health, in particular, the Minister Dr. Wilhelmina K. Jallah, Honourable Deputy Minister for Administration, Norwu G Howard, Honourable Deputy Minister and Chief Medical Officer, Dr. Francis Kateh and the Assistant Ministers. We recognize the collaboration and valuable contributions of the Human Resources for Health (HRH) division, including its Director, Mr. James M. Beyan. We also recognize members of the Technical Taskforce (TTF) and Expert Working Group (EWG) for their support and active participation. We also acknowledge the cooperation and contributions of various units within the MOH, including the Health Information System Unit (HIS), Policy and Planning Unit, and Nursing and Midwifery Unit during the process.

Our special thanks go to the World Health Organization (WHO) for their technical, logistical support and assiduous work to ensure that this WISN process was rigorous, systematic and participatory. Special gratitude to Dr Louis Ako-Egbe, Dr Charles Ocan and Moses Bolongei of WHO Country Office Liberia, and Dr Sunny Okoroafor for WHO regional office for Africa. We also recognize and appreciate the very valuable contributions of members of the Liberian Board for Nursing and Midwifery (LBNM), Liberia Medical Dental and Council (LMDC) and the Liberia Pharmacy Board.

The Ministry of Health benefits from the partnership and immense support of a community of distinguished partners contributing in various ways. WHO's support in the implementation of the policy and its accompanying strategic plan has been invaluable. We wish to acknowledge their overall support and contributions to the Ministry's programs.

## ACRONYMS

<b>AWT</b>	Available Working Time
<b>CHDD</b>	Community Health Department Director
<b>DMA</b>	Deputy Minister for Administration
<b>HRIS</b>	Human Resource Information System
<b>HRO</b>	Human Resource Officer
<b>MOH</b>	Ministry of Health
<b>NHPP</b>	National Health Policy and Plan
<b>NHRPP</b>	National Human Resources Policy and Plan
<b>SMT</b>	Senior Management Team
<b>TOT</b>	Training of Trainers
<b>TTF</b>	Technical Task Force
<b>WHO</b>	World Health Organization
<b>WISN</b>	Workload Indicators of Staffing Needs

# 1. INTRODUCTION

## 1.1 Demographic Profile

Liberia, officially the Republic of Liberia, is a country on the West African coast. It is bordered by Sierra Leone to its northwest, Guinea to its north, Ivory Coast to its east, and the Atlantic Ocean to its south and southwest. It has a population of 5,214,030 million (LDHS 2019-2020) and covers an area of 111,369 square kilometers (43,000 sq. mi). English is the official language, but over 20 indigenous languages are spoken, reflecting the country's ethnic and cultural diversity. The country's capital and largest city is Monrovia.



Figure 1: Map of Liberia

Liberia is divided into fifteen counties, which, in turn, are subdivided into a total of 90 districts and further subdivided into *clans*. The oldest counties are Grand Bassa and Montserrado, both founded in 1839 prior to Liberian independence. Gbarpolu is the newest county, created in 2001. Nimba is the largest of the counties in size at 11,551 km<sup>2</sup> (4,460 sq. mi), while Montserrado is the smallest at 1,909 km<sup>2</sup> (737 sq. mi). Montserrado is also the most populated county with 1,144,806 inhabitants as of the 2008 census.

Superintendents appointed by the president administer the fifteen counties. The Constitution calls for the election of various chiefs at the county and local level, but these elections have not taken place since 1985 due to war and financial constraints.

Parallel to the administrative divisions of the country, are the local and municipal divisions. Liberia currently does not have any constitutional framework or uniform statutes, which deal with the creation or revocation of local governments. All existing local governments – cities, townships, and a borough – were created by specific acts of the Liberian government, and thus the structure and duties/responsibilities of each local government varies greatly from one to the other<sup>1</sup>.

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<sup>1</sup> *Investment Plan for Building a Resilient Health System in Liberia 2015 to 2021* Ministry of Health, 2015

**Table 1:** Liberia's population by county

County	Capital	Population	Number of Districts	Year Established
Bomi	Tubmanburg	84,119	4	1984
Bong	Gbarnga	333,481	12	1964
Gbarpolu	Bopolu	90,192	6	2001
Grand Bassa	Buchanan	224,839	8	1839
Grand Cape Mount	Robertsport	129,055	5	1844
Grand Gedeh	Zwedru	126,146	3	1964
Grand Kru	Barclayville	60,106	18	1984
Lofa	Voinjama	276,863	6	1964
Margibi	Kakata	199,689	4	1985
Maryland	Harper	136,404	2	1857
Montserrado	Bensonville	1,244,806	4	1839
Nimba	Sanniquellie	480,088	6	1964
RiverCess	RiverCess	65,862	6	1985
RiverGee	Fishtown	69,318	6	2000
Sinoe	Greenville	107,932	17	1843

**Source:** Liberia Demographic Health Survey 2019-2020

## 1.2 Health Profile

The 2016 Health Workforce Census recorded a total of 16,064 health workers in Liberia; including 6,999 (43.6%) non-clinical and 9,065 (56.4%) clinical staff. Of this, core clinical cadres (Midwives, Nurses, Physicians, Physician Assistants) made up 4,756 (52.5%) of the clinical staff. Registered Nurses and Physicians accounted for the highest (64.7%) and lowest (4.9%) proportion of clinical cadre, respectively. These figures represent a marked increase in the workforce from 9,196 health and social welfare workers in 2009 (of which only 2,181 were core clinical workers)<sup>2</sup>. The current density of core clinical health workers - 11.8 personnel per 10,000 population - is well below the WHO global threshold of at least 23 per 10,000 population, and varies significantly from county to county. Majority (68.2%) of healthcare workers are found in four of the 15 counties (Montserrado, Margibi, Bong and Nimba). The number of health workers deployed to their counties of origin varies from 5% in Montserrado to 74% in Lofa, and is generally higher in rural or sparsely populated counties<sup>3</sup>.

Malaria and Acute Respiratory Infection (ARI) remain the major cause of outpatient consultations and hospitalization in the health system of Liberia, including during the COVID-19 pandemic. For the past three years, malaria remains the leading cause for inpatient admissions (34% on average), while ARI (7%), Sexually Transmitted Infections, STIs (3%), Malaria in pregnancy (4%), Typhoid (5%) and all other causes (15%)<sup>4</sup>.

Health system performance indicators in Liberia remain poor. In 2013, infant, child, and under-5 mortality rates were 54, 42 and 94 deaths per 1,000 live births, respectively<sup>5</sup>. However, some maternal & child health indicators have improved slightly in the 7-years preceding the 2019-20 Liberia demographic Health Survey (LDHS). For example, 84% of births were assisted by skilled attendants; maternal mortality dropped from 1,072 to 742 deaths per 100,000 live births; child mortality declined from 42 to 33 deaths per 1000 live births; health facility deliveries have increased from 37% (2007) to 80% (2019-20); proportion of deliveries assisted by skilled birth attendants increased from 46% (2007) to 84% (2019-20), while postnatal checks within 48 hours of delivery increased from 71% (2013) to 80% (2019-20)<sup>6</sup>. In addition, pregnancy-related mortality for the 7 years period preceding the 2019-20LDHS was 913 deaths per 100,000 live births and the proportion of

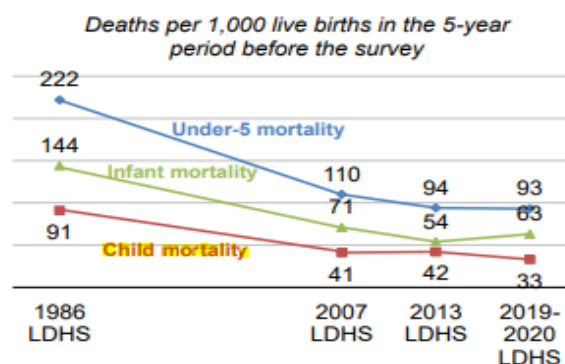


Figure 2: Trends in early childhood mortality rate, LDHS

<sup>2</sup> HRH Census Report 2010

<sup>3</sup> HRH Census Report 2016

<sup>4</sup> Ministry of Health -Health Information Service data 2021

<sup>5</sup> Liberia Institute of Statistics and Geo-Information Services (LISGIS): Liberia Households Income and Expenditure Survey 2014 Statistical Abstract, March 2016.

<sup>6</sup> Liberia Demographic and Health Survey 2019-20

pregnant women who received the 3<sup>rd</sup> dose of Intermittent Preventive Treatment for malaria (IPT3) at the 3<sup>rd</sup> ANC increased from 18% (2013) to 40% (2019-20)<sup>7</sup>. However, a lot needs to be done to improve these indicators and consequently the quality of care.

**Table 2:** Health system indicators from the LDHS 2019-2020

Health Indicators	LDHS, 2019-20
Literacy rate (female)	52%
Literacy rate (male)	75%
Employment status (currently)/female	61%
Employment status (currently)/male	81%
Total Fertility Rate (TFR), children per woman	4.2%
Use of modern family planning method by married women (15-49 years)	57%
Antenatal care provided by skilled health workers	
Skilled assistance during delivery	84%
Institutional Deliveries	80%
Children 12-23 months with full immunization coverage	51%
Stunting in under-five children	30%
Wasting in under-five children	11%
Underweight in under-five children	3%
Insecticide-Treated nets ownership (household)	55%
Insecticide-Treated Net use (pregnant women 15-49 years)	47%
Insecticide-Treated Net use (children under-five)	44%
Children under-5 with fever receiving malaria treatment	25%
Pregnant women receiving intermittent preventive therapy (IPT)	43%
Comprehensive knowledge of HIV/AIDS (female)	95%
Comprehensive knowledge of HIV/AIDS (male)	96%
Pregnancy-related mortality ratio (100,000 live births)	913
Maternal mortality ratio (maternal deaths per 100,000 live births)	742

**Source:** Liberia Demographic Health Survey (LDHS) 2019-2020

<sup>7</sup> Ibid



### 1.3 Overview of the health system

After the devastating effects of the 14-years civil war, Liberia has embarked on a number of health system strengthening approaches, including a transition from the Basic Package of Health Services (BPHS) to the Essential Package of Health Services (EPHS)<sup>8,9</sup>. The 2014 Ebola virus disease (EVD) outbreak revealed the weaknesses in the health system and compromised the implementation of the ten-year National Health Policy & Plan (2011-2021), which motivated the formulation of a health sector recovery and investment plan (2015-2021)<sup>10</sup>. The investment plan complemented the NHPPP and served as a roadmap for future implementation of the health sector strategy. The former had nine investment areas (*fit-for-purpose health workforce, community engagement, leadership and governance, health information system, quality health service delivery, medicines and technology, emergency preparedness and response, health financing and health infrastructure*) which if strengthened will enable the health sector to become responsive and proactive in dealing with future outbreaks and public health emergencies<sup>11</sup>.

Despite contextual and systemic challenges, Liberia made some progress in addressing its health issues and achieved its MDG 4 targets by 2012. While there are still challenges, particularly in maternal mortality, some key outcomes have shown improvements between 2007 and 2020, such as proportion of facility-based deliveries and births attended by skilled health personnel (as highlighted in *section 1.2* above). However, current HMIS data shows a reversal in the gains made in maternal and child health indicators such as ANC attendance, skilled birth attendance and immunization coverages since the EVD outbreak.

The government of Liberia and partners continuously develop new strategies and implement innovative and context-specific interventions geared towards meeting the health needs of the population. The health system strives to provide safe, effective and affordable essential healthcare services to its population (rural & urban), including essential medicines and vaccines, at every stage of their life and development without falling into poverty – Universal Health Coverage. Such efforts include creating the institutional environment to enhance the provision of quality health services (health policies & strategies, establishing a quality directorate and guidelines for health service continuity during outbreaks), enhancing health workforce capacity through trainings, sustaining and improving healthcare infrastructure and strengthening strategic partnerships.

There are 874 health service delivery points in Liberia, across the 15 counties. Majority are public health facilities (54.3%). There are few Hospitals (4.3%) and Health Centers (7%), while clinics are majority (88.7%) of health facilities with almost equal distribution between rural (49.6%) and urban (50.4%) areas<sup>12</sup>. There are at least 18 institutions of training for health personnel in Liberia, of which majority (>44%) are in Montserrado county<sup>13</sup>.

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<sup>8</sup> Essential Package of Health Services. Primary Care: The Community Health System, 2011

<sup>9</sup> Essential Package of Health Services. Secondary and Tertiary Care – The District, County & National Health system, 2011

<sup>10</sup> Investment Plan for Building a Resilient Health System, 2015 to 2021

<sup>11</sup> Ibid

<sup>12</sup> Health Information System (HIS), MoH

<sup>13</sup> Health Workforce Census Report 2016

# 1.5 Health Workforce Planning and Management Processes

The policy, planning, and management component of the Health Workforce Program Implementation Plan 2015-2021 was intended to build the capacity of the Ministry of Health to effectively plan and manage the health workforce. Activities in this area were designed to support the Ministry of Health to develop and institute the systems, processes, and tools required to improve the management of the public sector health workforce. When implemented, these activities were expected to drive improvements in the absorption, deployment, and retention of the health workforce, which are critical intermediate outcomes that contribute to the program’s key workforce outcome. In this respect, the policy, planning, and management component contributed indirectly, to increase the number of public health professionals competent to provide high quality care at all levels of health service delivery<sup>14</sup>.

The MOH has a HRPP and onboarding standard precautions. The HRPP is relevant to all workers within the health sector working in public, private-for-profit (PFP), and private not-for-profit (NFP) training institutions and facilities, including those owned by non-governmental and faith-based organizations (NGOs and FBO’s). It has been developed to provide a vision for addressing the human resources (HR) challenges in the sector and ensuring that every person in every community has equitable and affordable access to competent and motivated health workers, who are working in safe, supported and enabling environments and using the right “tools of the trade.” The recruitment policy and onboarding standard procedure ensures that the ministry applies best practices in the recruitment and deployment of staff<sup>15</sup>. In light of multiple national priorities and demands on limited resources, establishing an equitable health and social welfare system requires a sustained commitment by all stakeholders to use every available resource wisely and to do so in an inclusive, participatory manner.

The four overarching objectives of the HRPP are:

- 1. To increase the number of equitably distributed, qualified and high-performing health personnel at all levels;
- 2. To upgrade the number of high-performing facilities and institutions that promote continuous learning and assure quality;
- 3. To strengthen the workforce to be people-centered, gender-sensitive and service-oriented;
- 4. To increase the number of safe and suitable learning institutions and workplace equipped with the tools of the trade.

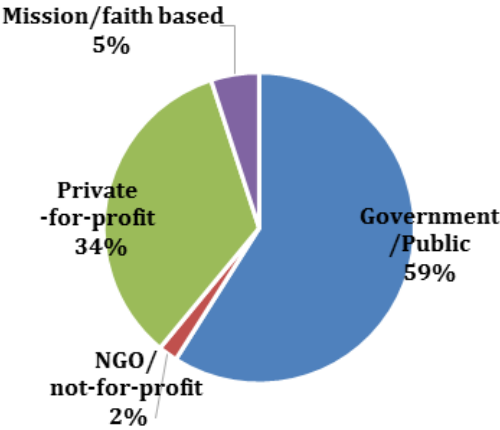


Figure 3: Ownership of health facilities in Liberia, 2018

<sup>14</sup> Health Workforce Program Implementation Plan 2015-2021)

<sup>15</sup> National Human Resources Policy and Plan 2011-2021

The HRH Unit was created in June 2016 to improve health workforce management. The capacity to perform this task is still at a sub-optimal level at both national and sub national levels. Staffing needs in facilities are currently based on catchment population estimates. For example, a health clinic is estimated to require 1 nurse and 1 midwife. This standard is then multiplied by the number of health clinics in the counties. With 389 public health clinics in Liberia, 389 nurses and 389 midwives would be needed nationally and they would be equally distributed to the clinics, irrespective of the workload of the clinic.

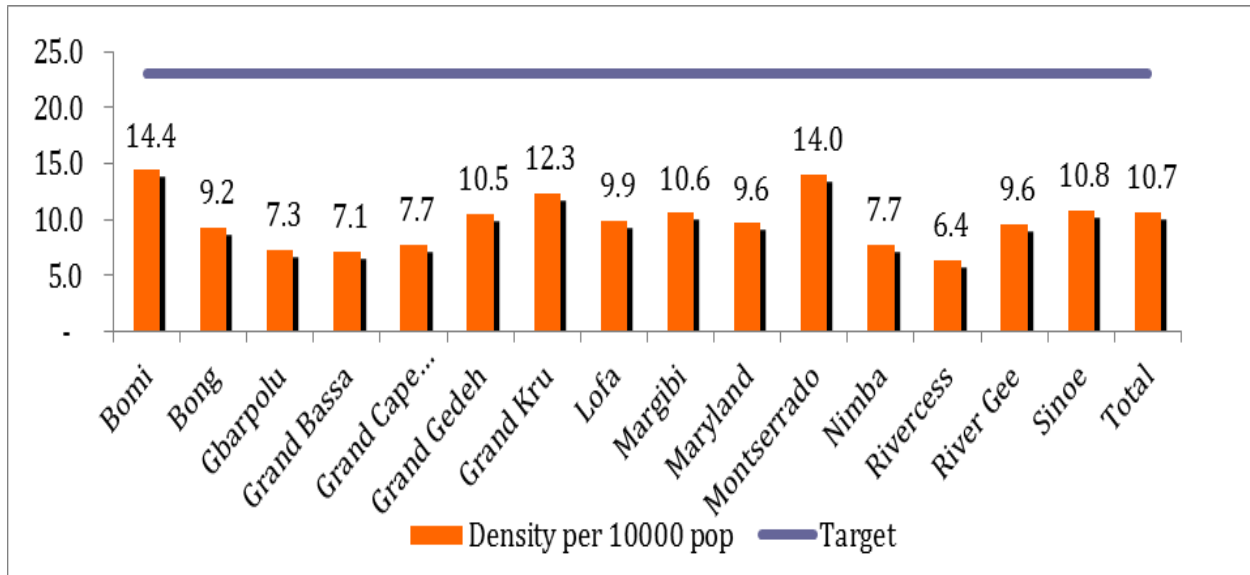


Figure 4: Core health workforce density per 10,000 pop by county, Liberia 2018

The target for core health workforce (physician nurses and midwives) density is 23 per 10,000 populations which is the recommended minimum WHO workforce density. Liberia core health worker (physician/physician assistant, nurses and midwives) density is 11, similar to 11.4 in 2016 health workers per 10,000 population<sup>16,17</sup>, which is less than half of WHO recommendation.

<sup>16</sup> Service Availability and Readiness Assessment (SARA) 2016

<sup>17</sup> Service Availability and Readiness Assessment (SARA) 2018

## 1.3 Justification for the National WISN Study, objectives and expected outcomes

### 1.3.1 Justification

Liberia is facing a severe shortage of health care workers, in particular doctors, nurses and midwives. The current health workforce density is 11 workers per 10,000 population<sup>18</sup>, which is far below the WHO recommended 44.5 personnel per 10,000 population. According to the National Human Resource Policy and Plan (NHRPP 2011-2021), more than 350 medical doctors were required for adequate healthcare delivery in Liberia<sup>19</sup>. However, only about 114 doctors existed in the country and mostly serving in administrative/management positions<sup>20</sup>. Although the Health Workforce Program is tackling the doctors, nurse and midwives shortage through increased production and deployment<sup>21</sup>, there is need for more efforts to close the existing gap. Recent statistics show that there are about 380 physicians, 2415 nurses and 843 mdwives in Liberia (table 3).

Health worker allocation and distribution in Liberia is sub-optimal and not based on workload in facilities. This is because allocations are determined on the basis of standard human resources profiles for each facility type. Although facility types are established as per the demand, facility-based targets do not take differences in the catchment area, service utilization or the needs of the population served by each facility into account. The same number of health workers with the same skills set would be allocated to two clinics, regardless that one clinic may be located in a more densely populated area or in an area with more service delivery needs e.g. deliveries (i.e. potentially requiring more midwives). This “one-size-fits-all” allocation has led to some facilities being over-staffed while others remain under-staffed<sup>22</sup>.

Considering the HRH challenges, imbalance workload and the huge staff distribution defaced by the sector, the WISN study was intended to establish the first ever staffing norms for Liberia and consequently:

- Improve performance management of the health workforce while simultaneously building capacities in MoH HRH staff at national and sub national levels.
- Develop a fit-for-purpose, motivated health workforce for Liberian public health sector.

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<sup>18</sup> *Service Availability and Readiness Assessment (SARA), 2018*

<sup>19</sup> *National Human Resource Policy and Plan 2011-2021*

<sup>20</sup> *SARA, 2018*

<sup>21</sup> *Health Workforce Program Implementation Plan 2015-2021*

<sup>22</sup> *Ministry of Health -Health Information Service 2021*

- Ensure efficient health worker allocation and planning at national level and across Liberia's public health facilities, by replacing the facility-based NHRPP allocations with evidence and demand-based human resources allocation guidelines
- Develop task-shifting strategies that will ease the workload of Liberian doctors, midwives and other cadres
- Guide and feed into the review and development of new national and sub sectoral and programmatic policies and strategies such as the National Health Policy and Plan (NHPP, 2022-2031, Health Sector Strategy 2022-2026 and the National Health Quality Strategy 2022-2026 as part of the overall health systems strengthening efforts during and beyond COVID-19 for UHC and other health related SDGs.
- Provide tools for advocating for investments in Human Resources for Health in Liberia

### 1.3.2. Objectives

1. To conduct and institutionalize WISN in the Liberia health sector.
2. To establish the staffing norms for various levels of facilities in Liberia based on their broad locations (city, town, trading center, rural and community level) to improve service delivery
3. To develop an implementation guide for the implementation of the staffing norms for improved service delivery

### 1.3.3. Expected Output

- 1) Endorsed implementation strategy/roadmap
- 2) National WISN report with information on implementation process, workload components, activity standards, and staffing levels and gaps for various levels of health facilities
- 3) National Staffing norms for improved service delivery for various levels of health facilities
- 4) An implementation guide for the staffing norms of hospitals.

The WISN process, when completed, will provide information on workload components, activity standards, staffing levels and gaps for various levels of health facilities. It will determine how many health workers are required to cope with actual workload in a given facility. The study will also estimate staffing requirements for clinics and Health centers

in the country provide an understanding of the workload of staff at a given facility and establish fair workload distribution among staff.<sup>5</sup>

**Table 3: Health workforce distribution by county**

<b>Professional Details</b>	<b>TOTAL</b>	<b>BOMI</b>	<b>BONG</b>	<b>GBARPOLU</b>	<b>GRAND BASSA</b>	<b>GRAND CAPE MOUNT</b>	<b>GRAND GEDEH</b>	<b>GRAND KRU</b>	<b>LOFA</b>	<b>MARGIBI</b>	<b>MARYLAND</b>	<b>MONTSERRADO</b>	<b>NIMBA</b>	<b>RIVER GEE</b>	<b>RIVERCESS</b>	<b>SINOE</b>
Administrative support	2404	119	262	56	97	108	124	81	269	52	81	711	206	90	60	88
Biomedical Technician	17	1	1	1	1	1	1	1	1	1	0	4	1	1	1	1
Clinical Support	2618	133	284	69	102	119	171	97	282	98	123	430	333	118	81	178
Core Administrative	507	10	22	8	11	14	16	8	17	15	12	282	61	8	11	12
EHT	120	3	6	2	8	5	7	0	7	6	6	43	16	2	4	5
Laboratory Technician	99	2	14	1	4	3	5	4	8	4	4	26	17	2	3	2
Midwife	843	27	125	18	21	23	75	25	96	44	31	216	53	24	22	43
Nurse	2415	116	260	43	142	104	96	53	175	150	78	760	248	56	54	80
OR Technician	43	1	0	1	1	2	0	1	4	1	0	14	15	2	1	0
Pharmacist	148	3	8	4	4	6	3	2	4	7	3	86	10	3	3	2
Physician	380	12	23	4	9	4	4	4	11	28	8	232	31	2	4	4
Physician Assistant	227	9	15	5	9	15	13	11	20	10	7	85	12	8	4	4
X-Ray Technician	22	2	3	0	1	0	3	1	1	0	2	4	4	0	0	1
<b>GRAND TOTAL</b>	<b>9843</b>	<b>438</b>	<b>1023</b>	<b>212</b>	<b>410</b>	<b>404</b>	<b>518</b>	<b>288</b>	<b>895</b>	<b>416</b>	<b>355</b>	<b>2893</b>	<b>1007</b>	<b>316</b>	<b>248</b>	<b>420</b>

Source: HR Department, MoH (October 2022)

## 2.0 WISN IMPLEMENTATION PROCESS IN LIBERIA

Workload Indicators of Staffing Needs (WISN), a human resource tool intended to guide the setting of staffing norms for HR planning and management, is the first of its kind conducted in Liberia. The Ministry of Health (MoH) initiated the WISN process in 2016, and later in 2018, with support from the World Bank but without success partly because of interrupted technical assistance. The MoH, in collaboration with the World Health Organization (WHO) and support from World Bank and other partners, re-initiated the WISN process in 2019 and held a stakeholders' inception workshop and training-of-trainers (TOT) workshop. Efforts were made to complete the exercise in the first quarter of 2020, however, the plan was interrupted by the COVID-19 pandemic and the associated public health restrictions.

In 2021, the implementation of WISN started with stakeholders' re-engagement and consultation, which resulted to the development of a new implementation roadmap (including a budget of over \$200,000). Between February and May 2021, the WISN Implementation Strategy and Plan, that indicated the composition of the implementation groups and their terms of reference (ToR), was completed and approved by the Hon. Minister for Health. The strategy also stated the objectives and expected outputs of WISN (Section 1.3.2 & 1.3.3).



**Photo 1: Hon. Minister, some SMT members and WHO team at the WISN launch**

The Honorable Minister of Health for Liberia inaugurated the three WISN implementation groups: the National Steering Committee, Technical Task Force (TTF) and Expert Working Group (EWG) – on 8<sup>th</sup> June 2021 at the launching of the WISN process and TOT workshop. The steering committee had members comprising of the senior management team of the Ministry of Health and representatives of key agencies and institutions, including the Civil Service Agency, Liberia Health Regulatory Council. The TTF had members comprising of the Asst. Minister Curative Services, Directors of Planning, Policy and Research, County Health Services, Health Quality Management Unit, Family Health Division, Health Information System, Human Resources, Chief Nursing Officer, Asst. Director for Training and Development, Human Resource Coordinators and Assistants, and the Pre-Service Education Officer.

Between 8<sup>th</sup> to 11<sup>th</sup> June 2021 a TOT workshop was organized in Monrovia, and facilitated by the WHO team, to build capacity of national actors on WISN implementation process and method in view of the planned conduct of the WISN exercise, as well as subsequent use WISN results for evidence-



**Photo 2: Group photo of some participants & MoH senior management at the WISN TOT**



based health workforce planning and management. The workshop was attended by 49 participants comprising of, 15 Community Health Department Directors (CHDD) and 18 Human Resource Officers from the 15 counties and TTF members.

A three-day workshop was organized for the National Expert Working Groups from 18<sup>th</sup> to 20<sup>th</sup> October, 2021 to define the Workload Components (WLC) and Activity Standards (AS) for physician assistants, nurses, nurse anesthetist, midwives, laboratory technician, laboratory aids, nurse aids and dispensers serving in the primary level of care (clinic and health centre). The workshop was attended by 89 participants (7 cadres from clinics and 10 cadres from HCs). During the workshop, the cadre-specific groups listed the activities (health service, support and additional activities) that each cadre were currently performing based on their trainings, approved scope of practice and set service, category and individual standards, respectively, for the listed workload activities. Afterwards, pre-validation and consensus were built on the WLC and AS during plenaries.



**Photo 3: TTF with some data managers at the data collection workshop, Monrovia**

Thereafter, a training session for data collectors (national and county level data managers and M&E officers) was held from 21<sup>st</sup> to 23<sup>rd</sup> October 2021. 47 data managers were trained on the use of the WISN data collection tools for 2 days, while day 3 was dedicated for a data collection pilot exercise in 56 sampled health facilities in Montserrado county to validate the identified health service, additional and support activities and activity standards, identify the other data sources for the study and triangulate the statistics from health service activities obtained from the national DHIS 2.0 and national HMIS monthly summary forms (MSF). A two-day validation session (16<sup>th</sup> and 17<sup>th</sup> December, 2021) brought together 80 participants (7 cadres from clinics, 10 cadres from HC, TTF, partners) from the selected cadres from clinics and health centres in the 15 counties of Liberia, to validate the WLC and AS defined by the Expert Working Group.

Between 31<sup>st</sup> January and 14<sup>th</sup> February, 2022, secondary data (service delivery and HR) was collected from the DHIS platform for all 387 public primary health facilities (36 health centres and 351 clinics) during a data collection session held in Ganta, Nimba county. The use of secondary data was informed by the pilot conducted in October 2021 as well as previous WISN studies that demonstrated that the DHIS is a reliable and readily available source of health service statistics needed for conduct of WISN. Information on working hours per day, working days per week, public holidays, approved sick leave days and average number of days that health workers are away on trainings organized by government and development partners was obtained at a plenary session held during the data cleaning and analysis workshop.



**Photo 4: WHO TA facilitating WISN workshop in Monrovia**



WISN data cleaning and the application of the WISN Software/tool in 387 public primary health facilities in Liberia was conducted between 7<sup>th</sup> to 11<sup>th</sup> March, 2022 in a workshop facilitated by WHO with the data managers, national TTF members and county HR officers in attendance. The output of the workshop was draft WISN results for the 387 public health facilities, excluding sixty-six private and faith-based facilities which did not have data on health service activities and HR on the DHIS platform in the final analysis. Review of data and results for each public health facility to provide quality assurance to the analysis process by the WHO technical lead ensued afterwards and this lasted from 15<sup>th</sup> – 19<sup>th</sup> March, 2022. Findings of the WISN result will be validated by key health sector stakeholders including TTF members, in April 2022. After the validation the WISN results will be presentation to the steering committee for endorsement in May 2022.

**Table 4: Overall summary of public health facilities included in WISN by county in Liberia, March 2022**

SN	County name	# Health centres	# Clinics	Tot. # Health Facilities
1	Bomi	0	21	21
2	Bong	0	39	39
3	Grand Bassa	0	20	20
4	Gbarpolu	0	13	13
5	Grand Cape Mount	2	29	31
6	Grand Kru	4	12	16
7	Grand Gedeh	2	16	18
8	Lofa	4	45	49
9	Margibi	5	12	17
10	Maryland	1	17	18
11	Montserrado	11	31	42
12	Nimba	4	35	39
13	Rivercess	1	12	13
14	River Gee	2	15	17
15	Sinoe	0	34	34
<b>Total</b>		<b>36</b>	<b>351</b>	<b>387</b>

The WISN standards for laboratory workers (technicians and aides) are missing the final WISN results because the electronic Laboratory Management Information System (eLMIS) is still under development, hence routine service delivery data for lab personnel is absent on the DHIS platform which served as a data source for WISN for clinics and health centres in Liberia. In addition, the WLC and AS for pharmacists were similar to those of the dispensers in health centres in Liberia. Pharmacists do not serve at the clinic level.

<b>Table 5: WISN APPLICATION PROCESS IN LIBERIA</b>		
<b>ACTIVITIES</b>	<b>TIMELINE</b>	<b>RESPONSIBLE PERSON (S)/GROUP</b>
<b>I. Mobilizing commitment through advocacy</b>	2 March – 27 May, 2021	<b>World Health Organization:</b> Dr Charles Ocan, Dr Peter Clement, Dr Sunny Okoroafor <b>Ministry of Health:</b> Mr Moibah Sherif, Mr James Beyan and Mrs Norwu Howard
<b>II. Development and Finalization of WISN Implementation Strategy and Plan</b>	5 May – 6 June, 2021	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Dr Charles Ocan, Dr Sunny Okoroafor
<b>III. Establishment and inauguration of the three (3) WISN Implementation groups for the Liberia – National Steering Committee, Technical Task Force (TTF)/ WISN Study Group (WSG) and Expert Working Group (EWG)</b>	8 June 2021	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Dr Charles Ocan, Dr Sunny Okoroafor
<b>IV. Training of trainers workshop on WISN</b>	8 – 11 June, 2021	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Dr Sunny Okoroafor
<b>V. Expert Working Group (EWG) Workshop to define national Workload components and activity standards for Physician assistants, Nurses, Nurse Anesthetist, Nurse Aids, Midwives, Lab technicians &amp; Dispensers in public primary level of care,</b>	18 – 20 October, 2021	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Dr Sunny Okoroafor
<b>VI. Workshop for data collectors to enhance capacity of data managers and M&amp;E officers in WISN data collection tools, including WISN software</b>	21 – 22 October, 2021	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Dr Sunny Okoroafor
<b>VII. Pilot of data collection process and field visits to 56 randomly selected public primary health facilities in Montserrado county</b>	23 October, 2021	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Dr Sunny Okoroafor
<b>VIII. Workshops for EWG to revalidate national Workload Components and Activity Standards for physician assistants, Nurses, Nurse Anesthetist, Nurse Aids, Midwives, Lab technicians and Dispensers in public clinics and health centres</b>	16 – 17 December, 2021	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Moses Bolongei, Dr Louis Ako-Egbe, Dr Charles Ocan
<b>IX. National level workshop to collect data on health service statistics and current staffing of 378 public health facilities in the 15 counties of Liberia</b>	31 Jan – 14 Feb, 2022	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Moses Bolongei, Dr Charles Ocan

<b>X. Workshop to clean and update health service and HR statistics of 378 public primary health facilities</b>	7 – 11 March, 2022	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Moses Bolongei, Dr Sunny Okoroafor
<b>XI. Application of the WISN tool in 378 public health facilities (36 health centres and 351 clinics) in Liberia</b>	15 – 19 March, 2022	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Dr Sunny Okoroafor
<b>XII. Data Management, WISN results review and Report writing</b>	21 March – 4 April, 2022	<b>Ministry of Health TTF, World Health Organization:</b> Mr Sherif Moibah, Dr Louis Ako-Egbe, Dr Charles Ocan, Dr Sunny Okoroafor
<b>XIII. Validation of WISN results for health centres and clinics</b>	28 – 29 April, 2022	
<b>XIV. Presentation of National WISN study findings to State Steering Committee for endorsement</b>	May 2022	

## 3.0 WISN FINDINGS

### 3.1 Available working time

Health workers in Liberia do not provide health care services every day of a year. They take annual leaves, sick leaves and other leaves to attend trainings or personal needs, and also observe public holidays often compensated for as time-off. The time available in one year for a health worker in Liberia to provide services considering authorized and unauthorized absences i.e. the available working time (AWT) – is presented in table 4 below.

**Table 6: Available Working Time for select Frontline Health Workforce Cadres per year In Liberia**

Cadre	Working Days per week	Working Hours per day	Annual Leave	Public Holidays	Sick Leave	Special No Notice Leave	Training days per year	AWT in Weeks per year	AWT in Days per year	AWT in Hours per year
Nurses	5	8	20	11	15	5	12	39.4	<b>197</b>	<b>1,576</b>
Midwives	5	8	20	11	15	5	12	39.4	<b>197</b>	<b>1,576</b>
Nurse Aides	5	8	20	11	15	5	12	39.4	<b>197</b>	<b>1,576</b>
Nurse Anesthetist	5	8	20	11	15	5	12	39.4	<b>197</b>	<b>1,576</b>
Physician Assistants	5	8	20	11	15	5	12	39.4	<b>197</b>	<b>1,576</b>
Dispensers	5	8	20	11	15	5	12	39.4	<b>197</b>	<b>1,576</b>

The AWT for Liberia in 2022 for nurses, midwives, nurse aides, nurse anesthetist, physician assistants and dispensers was calculated as 39.4 weeks per year, 197 days per year and 1,576 hours per year. This was calculated based on the following considerations:

- nurses, midwives, nurse aides, nurse anesthetist, physician assistants and dispensers were on duty five (5) days a week and eight (8) hours per day; entitled to 20 days' annual leave and fifteen (15) days of sick leave; observed eleven (11) days of public holidays and an estimated five (5) days of special no notice leave and were in training for an average of 12 days within the year.

### 3.2 Workload components and activity standards

The workload components are the activities implemented by all nurses, midwives, nurse aides, nurse anesthetist, physician assistants, and dispensers in the various public clinics and health centers in Liberia. Table 6 below presents the identified basic health service, support and additional activities carried out by physician assistants in both clinics and health centres. The health service activities for which statistics are documented regularly in the national health management information system tools include: screening of patients, ward rounds, patient admission, discharge and referrals and minor surgeries. Physician assistants spend the longest time in screening under five patients and in performing minor surgeries as opposed to conducting ward rounds and discharging patients. The validated support activities (essential activities that are implemented by all physician assistants in clinics and health centres but are not documented) include; meetings, reporting and patient monitoring. Physician assistants spend significant amount of their time in writing service reports. Validated additional activities conducted by selected physician assistants, mainly heads of units or their designees, include supervision of facilities, general administration, meetings and community engagement.

**Table 7: Validated Workload components and activity standards for physician assistants**

HEALTH SERVICE ACTIVITIES	AS	UNIT TIME
Screening of patients (5 and above)	16	minutes / patient
Screening of patients (under 5)	23	minutes / patient
Emergency Admission (Health Centres only)	22	minutes / patient
Ward rounds (Health Centres only)	4	minutes / patient
Referral	15	minutes / patient
Deaths	11	minutes / patient
Discharge (Health Centres only)	3	minutes / patient
Minor surgeries	23	minutes / patient
SUPPORT ACTIVITIES	CATEGORY ALLOWANCE STANDARDS (CAS)	
Daily meetings	45 mins per day	
HMIS report	4 hours per month	
Follow-ups on patient outcome - HIV, TB and Malnutrition patients	20 mins every week	
Drug consumption quarterly reports	4 hours per quarter	
Health Facility Development Committee	90 mins per month	
IPC committee meeting	1 hour per month	
Staff meeting	1 hour per month	
ADDITIONAL ACTIVITIES	NUMBER OF STAFF	INDIVIDUAL ALLOWANCE STANDARDS (IAS)
Quarterly meeting with Trained Traditional Midwives (TTM)/ TBAs	1	1 hour per month
Facility supervision	1	2 hours per month
Community engagement	1	2 hours per month
General Administrative Functions	1	1 hour per day

Table 7 below presents the identified basic health service and support activities implemented by dispensers in primary health facilities. The only health service activity for which statistics are documented regularly in the HMIS tools is drug/medical product dispensing. The validated support activities include meetings only.

**Table 8:** Validated Workload components and activity standards for dispensers

HEALTH SERVICE ACTIVITIES	ACTIVITY STANDARDS	UNIT TIME
Dispensing of drugs	5	Minutes / patient
SUPPORT ACTIVITIES	CATEGORY ALLOWANCE STANDARDS	
General facility meeting	1 hour per month	
Daily meetings	45 mins per day	

For nurse aides serving at the primary care level, the identified basic health service which are provided by all nurses and documented in HMIS registers include; vital signs and infant growth monitoring, vaccination and inpatient care. Nurse aides spend most of their time providing care to hospitalized patients and little time to measure and record vital signs. The validated support activities for nurse aides include; health education, waste management and managing patient records. Of these, most of their time is spent in completing vaccination registers as shown in table 8 below.

**Table 9:** Validated Workload components and activity standards for nurse aides

HEALTH SERVICE ACTIVITIES	AS	UNIT TIME
Vital Signs (Clinic and health centre)	5	minutes / patient
Immunization (Clinic)	16	minutes / patient
Inpatient Care (health centre)	30	minutes / patient
Growth monitoring and nutrition counselling (Clinic and health centre)	10	minutes / patient
SUPPORT ACTIVITIES	CATEGORY ALLOWANCE STANDARDS (CAS)	
Waste Disposal	10 mins per day	
Daily recording of vaccines administered (Clinics only)	30 mins per day	
Group health education	10 mins per day	
Sorting patient cards	2 mins per day	

All the midwives at the primary level of care (clinics and health centres) in Liberia provide the following basic health services and which are captured in the national HMIS registers: antenatal care, family planning, normal deliveries, Caesarean deliveries (CS), postnatal care and referrals. Of these, midwives spend most of their time in conducting normal deliveries and CS. Referral of

patients consumes the least time of midwives. Health education, meetings and outreach activities constitute support for which all midwives perform but which are not recorded in HMIS registers. Outreach activities consume significant amount of time of midwives. Additional activities for midwives include teaching/mentorship, reporting and administrative duties.

**Table 10:** Validated Workload components and activity standards for midwives

<b>HEALTH SERVICE ACTIVITIES</b>	<b>AS</b>	<b>UNIT TIME</b>
Antenatal care (1st visit)	<b>30</b>	minutes / patient
Antenatal care (subsequent visits)	<b>23</b>	minutes / patient
Normal delivery	<b>85</b>	minutes / patient
Caesarean section delivery	<b>52</b>	minutes / patient
Postnatal visits	<b>25</b>	minutes / patient
Family planning (condom, pills)	<b>28</b>	minutes / patient
Family planning - implants and injectable	<b>35</b>	minutes / patient
Discharge	<b>10</b>	minutes / patient
Referral	<b>12</b>	minutes / patient
<b>SUPPORT ACTIVITIES</b>	<b>CATEGORY ALLOWANCE STANDARDS (CAS)</b>	
Group health education	25 mins per day	
Meeting with TTM	2 hours per month	
Facility monthly meeting	1 hour per month	
Outreach activity	4 hours per month	
<b>ADDITIONAL ACTIVITIES</b>	<b>NUMBER OF STAFF</b>	<b>INDIVIDUAL ALLOWANCE STANDARDS (IAS)</b>
Clinical teaching/mentorship	1	1 hour per month
Reporting and administration	1	30 mins per day

Table 10 outlines the workload components and activity standards for nurses working in clinics and health centres in Liberia. Identified and validated health service functions include: triaging, screening, patient monitoring, drug administration, patient admission, discharge and referral. Time required to perform these functions varies, however, more time is required to screen and admit patients. Health education, meetings and outreach activities are carried by all nurses, but not recorded in registers at the facilities. The activities which are performed by selected nurses, especially the team leads/heads are: mentorship, reporting/administration, commodity management and sterilization of equipment. Significant amount of time is required to perform outreach activities and administrative duties.

**Table 11:** Validated Workload components and activity standards for nurses

HEALTH SERVICE ACTIVITIES	AS	UNIT TIME
Triaging	5	minutes / patient
Administering medications	10	minutes / patient
Patient monitoring	7	minutes / patient
Discharge	10	minutes / patient
Admission	20	minutes / patient
Referral	12	minutes / patient
Screening of patients (5 and above)	16	minutes / patient
Screening of patients (under 5)	23	minutes / patient
SUPPORT ACTIVITIES	CATEGORY ALLOWANCE STANDARDS (CAS)	
Monthly Meeting	1 hour per month	
Daily Health Talk	15 mins per day	
Outreach activities	4 hours per month	
ADDITIONAL ACTIVITIES	NUMBER OF STAFF	INDIVIDUAL ALLOWANCE STANDARDS (IAS)
Clinical teaching/mentorship	1	1 hour per month
Reporting and administration	1	8 hours per month
Requisition of medicine and commodities	1	1 hour per month
Sterilization of equipment	1	2 hours per week
Health facility development committee meeting	1	2 hours per month

Nurse anesthetists are found exclusively in health centres. The identified basic health service functions performed by this cadre comprise of; setting the operating room, pre- and post-operative assessment and intraoperative monitoring of patients. The latter requires more time, as opposed to postoperative assessment and care. The only support activity for nurse anesthetists is meetings, while additional functions include meetings, surgical outreach and administrative functions.

**Table 12:** Validated Workload components and activity standards for nurse anesthetics

HEALTH SERVICE ACTIVITIES	AS	UNIT TIME
Setting up operating room	40	minutes / patient
Emergency pre-operative assessment	15	minutes / patient
Electives pre-operative assessment	30	minutes / patient
Post-operative assessment	10	minutes / patient
Intra-operative monitoring	60	minutes / patient
Post-operative care	10	minutes / patient
SUPPORT ACTIVITIES	CATEGORY ALLOWANCE STANDARDS (CAS)	
Daily meeting	1 hour/day	



ADDITIONAL ACTIVITIES	NUMBER OF STAFF	INDIVIDUAL ALLOWANCE STANDARDS (IAS)
Surgical outreach	1	8 hours per year
Senior management and Supervisors meeting	1	3 hours per month

Table 12 highlights the validated workload components and activity standards for lab technicians and assistants (lab personnel) working in both health centres and clinics. The basic health services provided by all lab personnel include malaria diagnostic test, whole blood test, urinalysis, sputum test, stool, blood glucose, H.pylori, Widal, donor screening and infectious diseases (like HIV, syphilis, HBV & HCV). The highest amount of time is spent on urinalysis and screening of donor blood. Meanwhile, the least amount of time is spent in blood glucose test, haemoglobin test and stool analysis.

The activities carried out by all lab personnel but not captured in registers include; meetings, general cleaning and setting up, equipment maintenance and preparation of culture media. Meanwhile, reporting, supervision and inventory management constitute the set of activities carried out by a specific lab cadre.

**Table 13: Validated Workload Components and Activity Standards for Lab technicians and assistants**

HEALTH SERVICE ACTIVITIES	ACTIVITY STANDARDS	
Malaria rapid diagnostic test (MRDT) and microscopy	11	minutes / patient
Whole blood test/Hemoglobin Test and HCT	8	minutes / patient
Urinalysis/ MTT	22	minutes / patient
AFB ZNS procedure	9	minutes / patient
Stool Analysis	8	minutes / patient
HBV/HCV	14	minutes / patient
RPR/Syphilis	13	minutes / patient
HIV	13	minutes / patient
Skin Snap	12	minutes / patient
Blood Glucose	6	minutes / patient
H. Polyri	13	minutes / patient
Widal test	13	minutes / patient
Donor Screening	29	minutes / patient

SUPPORT ACTIVITIES	CATEGORY ALLOWANCE STANDARDS
Cleaning and disinfecting lab	10 mins per day
Setting up lab tables	2 mins per day
General facility meeting	1 hour per month
Daily meetings	30 mins per day
Quality control	4 hours per year
Culture media and reagent preparations	2 hours per week
Maintenance of equipment	4 hours per year

ADDITIONAL ACTIVITIES	NUMBER OF STAFF	INDIVIDUAL ALLOWANCE STANDARDS
Daily Report	1	1 hour per day
Weekly Report	1	1 hour per week
Monthly Report	1	3 hours per month
Requisitions and inventory management	1	2 hours per week
<u>Supervision of staff</u>	1	1 hour per week

### 3.3 Annual Health Facility Statistics and Standard Workloads

The annual statistics for the health service activities for 2019 and 2020 were extracted from the national DHIS 2.0 and the workloads distributed based on the proportion of available cadre(s) in each health center and clinic. Using the WISN software, the standard workload i.e. amount of a health service workload activity that one health worker can perform in one year in Liberia assuming the AWT was expended on the activity only, was calculated. The WISN software also calculated the Category Allowance Factor (CAF) and Individual Allowance Factor (IAF) using information on the allowance standards for the support and additional activities for each cadre.

### 3.4 WISN Results

The WISN findings for Liberia, and the counties are presented in tables 3.4.1.1 to 3.4.1.10, with tables for health facilities presented in tables 3.4.2.1 to 3.4.2.1. The calculated requirements presented were converted from continuous to discrete variables using the guidelines in WISN manual<sup>23</sup> presented below:

1.0 – 1.1 is rounded down to 1 and >1.1 – 1.9 is rounded up to 2

2.0 – 2.2 is rounded down to 2 and >2.2 – 2.9 is rounded up to 3

3.0 – 3.3 is rounded down to 3 and >3.3 – 3.9 is rounded up to 4

4.0 – 4.4 is rounded down to 4 and >4.4 – 4.9 is rounded up to 5

5.0 – 5.5 is rounded down to 5 and >5.5 – 5.9 is rounded up to 6

<sup>23</sup> World Health Organization. WISN: Workload Indicators of Staffing Need. User's Manual. Geneva: World Health Organization; 2010

### 3.4.1 WISN RESULT FOR HEALTH CENTRES IN LIBERIA

Sunny to complete the table below and write narrative after facility and county analysis tables are finalized for health centres and clinics

Table 14: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES ANAESTHETIST AND PHYSICIAN ASSISTANTS IN HEALTH CENTRES IN LIBERIA

COUNTY ES	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anesthetist				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Cape Mount	6	2	3.0	4	12	2	6.0	10	3	2	1.5	1	22	2	11.0	20	1	2	0.5	-1	23	4	5.8	19	10	66	0.2	-56
G. Gedeh	5	2	2.5	3	8	4	2.0	4	3	2	1.5	1	10	2	5.0	8	0	2	0.0	-2	7	5	1.4	2	1	19	0.1	-18
G. Kru	5	3	1.7	2	4	3	1.3	1	2	3	0.7	-1	12	3	4.0	9	0	3	0.0	-3	17	6	2.8	11	2	29	0.1	-27
Lofa	6	4	1.5	2	11	9	1.2	2	0	4	0.0	-4	7	4	1.8	3	0	4	0.0	-4	13	12	1.1	1	3	68	0.0	-65
Margibi	6	5	1.2	1	6	7	0.9	-1	5	4	1.3	1	6	5	1.2	1	0	5	0.0	-5	10	14	0.7	-4	1	27	0.0	-26
Maryland	2	2	1.0	0	5	7	0.7	-2	2	2	1.0	0	2	1	2.0	1	0	1	0.0	-1	7	6	1.2	1	3	90	0.0	-87
Montserrado	14	225	0.1	-211	61	27	2.3	34	13	9	1.4	4	56	13	4.3	43	0	11	0.0	-11	114	53	2.2	61	14	225	0.1	-211
Nimba	8	5	1.6	3	13	16	0.8	-3	10	7	1.4	3	27	4	6.8	23	0	6	0.0	-6	35	16	2.2	19	6	127	0.1	-121
Rivercess	1	1	1.0	0	1	1	1.0	0	0	1	0.0	-1	2	1	2.0	1	0	1	0.0	-1	1	1	1.0	0	0	1	0.0	-1
River Gee	3	2	1.5	1	6	2	3.0	4	5	2	2.5	3	7	2	3.5	5	0	2	0.0	-2	12	5	2.4	7	4	52	0.1	-48
<b>Liberia</b>	<b>56</b>	<b>251</b>	<b>0.2</b>	<b>-195</b>	<b>127</b>	<b>78</b>	<b>1.6</b>	<b>49</b>	<b>43</b>	<b>36</b>	<b>1.2</b>	<b>7</b>	<b>151</b>	<b>37</b>	<b>4.1</b>	<b>114</b>	<b>1</b>	<b>37</b>	<b>0.03</b>	<b>-36</b>	<b>239</b>	<b>122</b>	<b>1.9</b>	<b>117</b>	<b>44</b>	<b>704</b>	<b>0.1</b>	<b>-660</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

### 3.4.1.1 Grand Cape Mount County (GCM)

Table 13 shows that there are 6 dispensers providing services to the population served by 2 health centres (Damballa and Sinje) in Grand Cape Mount. The WISN calculations show that a surplus of 4 dispensers exist and the WISN ratio of 3.0 indicating that 300% of required dispenser is available.

**Table 15: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSE ANAESTHETIST, NURSES AND PHYSICIAN ASSISTANTS IN [GRAND CAPE MOUNT]**

Health Centre	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anaesthetist				Nurse				Physician Assistant			
	Existing Staff*	Calculated Requirement	WISN Ratio	WISN Difference	ES*	CR	WR	WD	ES	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Damballa	2	1	5.6	1	3	1	4.7	2	0	1	0.0	-1	5	1	20.8	4	0	1	0.0	-1	4	1	3.5	3	3	27	0.1	-24
Sinje	4	1	7.8	3	9	1	8.8	8	3	1	2.8	2	17	1	54.8	16	1	1	33.3	0	19	3	7.8	16	7	39	0.2	-32
GCM	6	2	3.0	4	12	2	6.0	10	3	2	1.5	1	22	2	11.0	20	1	2	0.5	-1	23	4	5.8	19	10	66	0.2	-56

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

There are 12 midwives serving the populace in the 2 health centres. The WISN calculation shows that a surplus of 10 midwives exist and a WISN ratio of 6.0 indicating that the county has more than the required number of midwives (600%) to serve in the health centres.

The county has 3 lab personnel serving in Sinje HC. The WISN calculation reveals that a surplus of one personnel exist and a WISN ratio of 1.5 indicating that the county has more than the required number of lab personnel to serve in the health centres.

For nurse aide, the WISN calculation reveals a surplus of 20 personnel and a WISN ratio of 11.0 indicating that the county has more than the required number of nurse aides (1100%) in the health centres.

One nurse anaesthetist serves the populace in 2 health centres, with Damballa HC not having any health worker of this cadre. The WISN calculation show that a shortage of one nurse anaesthetist exist and a WISN ratio of 0.5 indicating that only 50% of the required nurse anaesthetist is available.

There are 23 nurses providing services to the populace in 2 health centres. The WISN calculation shows that a surplus of 19 personnel exist and a WISN ratio of 5.8 indicating that 580% of the required nurses is available in the 2 health centres.

The population is served by 10 physician assistants in the 2 health centres. WISN calculations reveal that a shortage of 56 physician assistants exists and a WISN ratio of 0.2 indicating that just 20% of the required physician assistant is available.

### 3.4.1.2 Grand Gedeh County

The table below shows that there are 5 dispensers serving populace of Grand Gedeh county in 2 health centres. The WISN calculation reveals that a surplus of 3 dispensers exist and a WISN ratio of 2.5 indicating that 250% of the required staff is available (a surplus of 150%).

Eight (08) midwives provide health services in the 2 health centres in Grand Gedeh. WISN calculation show that a surplus of 4 midwives exist and a WISN ratio of 2.0 indicating that 200% of the required midwives is available.

There are 3 lab personnel (technicians & assistants) serving in 2 health centres. WISN calculation show that only 2 lab personnel are required indicating that a surplus of 1 personnel exist. WISN ratio of 1.5 shows that more lab personnel are available than required.

For nurse aide, 10 personnel exist whereas the WISN calculation show that only 2 nurse aides are required to serve the population in the 2 health centres indicating a surplus of 8 staff. The WISN ratio of 5.0 indicating that 500% of the required nurse aides is available (400% surplus).

**Table 16: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSE ANAESTHETIST, NURSES AND PHYSICIAN ASSISTANTS IN [GRAND GEDEH COUNTY]**

Health Centre	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anesthetist				Nurse				Physician Assistant			
	Existing Staff*	Calculated Requirement	WISN Ratio	WISN Difference	ES*	CR	WR	WD	ES	CR	WR	ED	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Gbarzon	2	1	4.7	1	3	2	1.3	1	1	1	1.9	0	3	1	11.1	2	0	1	0.0	-1	4	2	2.5	2	1	16	0.1	-15
Konobo	3	1	5.9	2	5	2	2.6	3	2	1	2.8	1	7	1	9.7	6	0	1	0.0	-1	3	3	1.2	0	0	3	0.0	-3
G. Gedeh	5	2	2.5	3	8	4	2.0	4	3	2	1.5	1	10	2	5.0	8	0	2	0.0	-2	7	5	1.4	2	1	19	0.05	-18

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

There is no nurse anesthetist in the 2 HCs in this county. The WISN calculation show that 2 nurse anesthetist are required and a WISN ratio of 0.0 indicating that 0% of the required personnel is available.

Seven (7) nurses provide services to the populace in the 2 HCs. The WISN calculation shows that 5 nurses are required meaning a surplus of 2 nurses exist, and the WISN ratio of 1.4 indicating that 140% of the required nurses is available.

For physician assistants, there is one PA serving the population in the 2 HCs, with no personnel in Konobo HC. The WISN calculation show that 19 PAs are required, highlighting a shortage of 18 PAs. The WISN ratio of 0.05 indicates that less than 1% of the required physician assistants is available.

### 3.4.1.3 Grand Kru county

Table 15 for Grand Kru County shows that there are 5 dispensers providing care to the populace in 3 clinics. The WISN calculation shows that 3 dispensers are required indicating that a surplus of 2 dispensers exist. The WISN ratio of 1.7 indicating that 170% of the required personnel is available.

For midwives, the WISN calculation indicate a surplus of 1 midwife in the 3 HCs, and a WISN ratio of 1.3 indicating that 130% of the required midwives is available.

There are 2 lab personnel (technicians and assistants) serving in the county, meanwhile 3 are actually required as shown by the WISN calculation. The WISN ratio of 0.7 indicates that only 70% of the required lab personnel are available.

The WISN calculation show that 3 nurse aides are required to serve the population in the 3 HCs in Grand Kru. However, 12 nurse aides exist indicating that a surplus of 9 personnel exist. The WISN ratio of 4.0 indicates that 400% of the required nurse aides is available.

**Table 17: WISN RESULTS FOR DISPENSERS, MIDWIVES, NURSES AIDES, NURSE ANAESTHETIST, NURSES AND PHYSICIAN ASSISTANTS IN [GRAND KRU COUNTY]**

Health Centre	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anesthetist				Nurse				Physician Assistant			
	Existing Staff*	Calculated Requirement	WISN Ratio	WISN Difference	ES*	CR	WR	WD	ES	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Barclayville	2	1	3.8	1	1	1	1.5	0	0	1	0	-1	7	1	19.4	6	0	1	0.0	-1	5	2	2.5	3	1	16	0.1	-15
Behwan	1	1	3.0	0	1	1	0.9	0	1	1	1.6	0	2	1	20.0	1	0	1	0.0	-1	6	2	3.6	4	0	1	0.0	-1
Buah	2	1	4.1	1	2	1	2.0	1	1	1	1.5	0	3	1	14.3	2	0	1	0.0	-1	6	2	3.1	4	1	12	0.1	-11
<b>G. Kru</b>	<b>5</b>	<b>3</b>	<b>1.7</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>1.3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0.7</b>	<b>-1</b>	<b>12</b>	<b>3</b>	<b>4.0</b>	<b>9</b>	<b>0</b>	<b>3</b>	<b>0.0</b>	<b>-3</b>	<b>17</b>	<b>6</b>	<b>2.8</b>	<b>11</b>	<b>2</b>	<b>29</b>	<b>0.07</b>	<b>-27</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

For nurse anesthetist, none exist in the 3 HCs. However, the WISN calculation show that 3 nurse anesthetist are required indicating a shortage of 3 personnel. The WISN ratio of 0.0 indicates that 0% of the required nurse anesthetist is available.

Two (2) PAs provide care in the 3 HCs, with no PA in Behwan HC. The WISN calculation show that 29 PAs are required in the 3 HCs indicating that a shortage of 27 PAs exist. The WISN ratio of 0.07 indicates that less than 1% of the required PA is available.

### 3.4.1.4 Lofa county

The table below shows that there are 6 dispensers providing services to the populace in 4 HCs in Lofa. The WISN calculation show that 4 dispensers are required indicating that a surplus of 2 dispensers exist. The WISN ratio of 1.5 indicates that there are more dispensers

(150%) in the 3 HCs than required.

For midwives, the WISN calculation shows that a surplus of 2 midwives exist in the 4 HCs. The WISN ratio of 1.2 indicates that 120% of the required midwife is available.

There are no lab personnel (technicians or assistants) in the 4 HCs in this county. The WISN calculation show that 4 staff are required, indicating that a shortage of 4 lab personnel exist. The WISN ratio of 0.0 indicate that 0% of the required lab staff is available.

Similarly, 4 nurse aides are required from the WISN calculation, but 7 exist indicating a surplus of 3 nurse aides. The WISN ratio of 1.8 indicates that more nurse aides (180%) are available in the 3 HCs than required.

There is no nurse anesthetist in the 4 HCs. The WISN calculation show that 4 personnel are required, indicating that a shortage of 4 nurse anesthetist exist. The WISN ratio of 0.0 indicate that 0% of the required nurse anesthetist is available.

**Table 18:** WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSE ANAESTHETIST, NURSES AND PHYSICIAN ASSISTANTS IN [LOFA COUNTY]

Health Centre	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anesthetist				Nurse				Physician Assistant			
	Existing Staff*	Calculated Requirement	WISN Ratio	WISN Difference	ES*	CR	WR	WD	ES	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Bolahun	2	1	4.4	1	2	1	2.4	1	0	1	0.0	-1	2	1	7.7	1	0	1	0.0	-1	3	2	1.8	1	1	20	0.1	-19
Foya	0	1	0.0	-1	2	3	0.8	-1	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	2	4	0.6	-2	0	1	0.0	-1
Konia	2	1	2.0	1	4	3	1.3	1	0	1	0.0	-1	2	1	4.4	1	0	1	0.0	-1	4	4	1.1	0	1	32	0.0	-31
Vahun	2	1	5.1	1	3	2	1.4	1	0	1	0.0	-1	3	1	9.1	2	0	1	0.0	-1	4	2	2.5	2	1	15	0.1	-14
<b>Lofa</b>	<b>6</b>	<b>4</b>	<b>1.5</b>	<b>2</b>	<b>11</b>	<b>9</b>	<b>1.2</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>0.0</b>	<b>-4</b>	<b>7</b>	<b>4</b>	<b>1.8</b>	<b>3</b>	<b>0</b>	<b>4</b>	<b>0.0</b>	<b>-4</b>	<b>13</b>	<b>12</b>	<b>1.1</b>	<b>1</b>	<b>3</b>	<b>68</b>	<b>0.04</b>	<b>-65</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

For nurses, 13 personnel exist in the 4 HCs while the WISN calculation indicate that 12 nurses are required indicating that a surplus of 1 nurse exist. The WISN ratio of 1.1 indicates that 110% of the required nurses is available.

There are 3 PAs in the 4 HCs, with none at Foya HC. The WISN calculation show that 68 PAs are required indicating that a shortage of 65 PAs exist. The WISN ratio of 0.04 indicate that less than 1% of the required PA is available.

### 3.4.1.5 Margibi county

Margibi County has 6 dispensers serving in 5 HCs. The WISN calculation show that 5 dispensers are required, indicating that a surplus of

1 dispenser exist. The WISN ratio of 1.2 indicates that 120% of the required dispensers is available.

For midwives, 7 workers are available but only 6 exist in the 5 HCs highlighting that a shortage of 1 midwife exist. The WISN ratio of 0.9 indicate that 90% of the required midwife is available.

The county has 5 lab personnel serving in 5 HCs. WISN calculation reveal that 4 personnel are actually required indicating that a surplus of 1 lab staff exist. The WISN ratio of 1.3 shows that more lab personnel exist than required.

There are 6 nurse aides providing care to the populace in the 5 HCs in Margibi. The WISN calculations estimates that 5 nurse aides are required indicating that a surplus of 1 personnel exist. The WISN ratio of 1.2 indicate that more nurse aides are available than required (20% surplus).

No nurse anesthetist exists in the 5HCs in Margibi. The WISN calculation indicate that a shortage of 5 nurse aides exists. The WISN ratio of 0.0 indicate that 0% of the required staff is available.

**Table 19:** WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSE ANAESTHETIST, NURSES AND PHYSICIAN ASSISTANTS IN [MARGIBI COUNTY]

Health Centre	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anesthetist				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	W D	ES*	CR	WR	WD	ES*	CR	WR	W D	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Cotton Tree	1	1	2.7	0	1	1	0.9	0	1	1	1.9	0	1	1	12.5	0	0	1	0.0	-1	1	3	0.3	-2	0	1	0.0	-1
Dolo Twn	1	1	1.7	0	1	1	0.9	0	1	1	1.5	0	1	1	11.1	0	0	1	0.0	-1	1	4	0.3	-3	0	1	0.0	-1
Kakata	1	1	2.0	0	1	1	0.9	0	1	0	2.3	1	1	1	16.7	0	0	1	0.0	-1	1	2	0.5	-1	0	1	0.0	-1
Marshall	2	1	4.6	1	2	1	1.7	1	1	1	1.5	0	3	1	12.0	2	0	1	0.0	-1	4	2	1.8	2	1	20	0.1	-19
Unificatx Town	1	1	1.1	0	1	3	0.4	-2	1	1	0.9	0	0	1	0.0	-1	0	1	0.0	-1	3	3	1.6	0	0	4	0.0	-4
<b>Margibi</b>	<b>6</b>	<b>5</b>	<b>1.2</b>	<b>1</b>	<b>6</b>	<b>7</b>	<b>0.9</b>	<b>-1</b>	<b>5</b>	<b>4</b>	<b>1.3</b>	<b>1</b>	<b>6</b>	<b>5</b>	<b>1.2</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>0.0</b>	<b>-5</b>	<b>10</b>	<b>14</b>	<b>0.7</b>	<b>-4</b>	<b>1</b>	<b>27</b>	<b>0.04</b>	<b>-26</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

For nurses, 10 staff exist meanwhile the WISN calculation show that 14 nurses are required in the 5 HCs, indicating that a shortage of 4 nurses exist. The WISN ratio of 0.7 indicate that only 70% of the required staff of this cadre is available.

There is one PA in Marshall HC and none in the other four. The WISN calculation show that 27 PAs are required to serve in the 5 HCs, indicating that a shortage of 26 PAs exist. The WISN ratio of 0.04 indicates that less than 1% of the required physician assistant is available.



### 3.4.1.5 Maryland county

Table 18 below shows that Pleebo HC has dispensers and the WISN calculation estimates that 2 dispensers are actually required to provide services to the population in this HC. The WISN ratio of 1.0 indicates that 100% (exact number) of the dispensers required is available.

There are 5 midwives in Pleebo HC. The WISN calculations show that 7 midwives are required indicating that a shortage of 2 midwives exist. The WISN ratio of 0.7 indicates that 70% of the required midwives is available.

Two lab personnel exist in Pleebo HC. WISN calculation reveal that exactly 2 personnel are required, and WISN ratio of 1.0 indicating 100% of required lab workforce is available.

For nurse aides the WISN calculation show that one personnel of this cadre is required, contrary to the 2 existing staff, indicating that a surplus of 1 nurse aide exist. The WISN ratio of 2.0 indicates that 200% of the required staff is available.

There is no nurse anesthetist in Pleebo HC. The WISN calculation show that 1 staff of this cadre is required indicating that a shortage of 1 staff exist. The WISN ratio of 0.0 indicates that 0% of the required nurse anesthetist is available.

**Table 20:** WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSE ANAESTHETIST, NURSES AND PHYSICIAN ASSISTANTS IN [MARYLAND COUNTY]

Health Centre	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anesthetist				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	C R	WR	W D	ES*	CR	WR	WD	ES*	C R	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	W D	ES*	CR	WR	W D
Pleebo	2	2	1.0	0	5	7	0.7	-2	2	2	0.9	0	2	1	1.7	1	0	1	0.0	-1	7	6	1.2	1	3	90	0.03	-87
Maryland	2	2	1.0	0	5	7	0.7	-2	2	2	1.0	0	2	1	2.0	1	0	1	0.0	-1	7	6	1.2	1	3	90	0.03	-87

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

Seven (7) nurses exist, meanwhile 6 are required as per the WISN calculation indicating a surplus of 1 nurse in Pleebo HC. The WISN ratio of 1.2 indicates that 120% of the required staff is available.

There are 3 physician assistants serving the population in Pleebo HC. WISN calculation indicate that 90 PAs are required, highlighting that a shortage of 87 PAs exist. The WISN ratio of 0.03 indicates that less than 1% of the required PA is available.

### 3.4.1. 7 Montserrado county

There are 14 dispensers serving the populace in 11 HCs Montserrado county, with no personnel of this cadre in 3 HCs. The WISN

calculation show that 225 dispensers are required indicating that a shortage of 211 personnel exist. The WISN ratio of 0.06 indicating that less than 1% of the required dispensers is available.

There are 61 midwives in 10 HCs and none in pipeline HC. WISN calculation show that 27 midwives are required, indicating that a surplus of 34 midwives exist, and a WISN ratio of 2.3 indicating that more midwives (230%) are available than required.

There are 13 lab personnel serving the populace in the 11 HCs. WISN calculation show that 9 staff of this cadre are required, indicating that a surplus of 4 staff exist. The WISN ratio of 1.4 indicates that more lab personnel (140%) are available than required.

For nurse aides, 56 personnel serve the populace under the 11 HCs in Montserrat. WISN calculation estimate that only 13 nurse aides are required indicating a surplus of 43 staff. The WISN ratio of 4.3 indicates that 430% of the required nurse aides available in the HCs.

There is no nurse anesthetist in all of the 11 HCs in Montserrat. WISN calculation show that 11 personnel of this cadre are required indicating that a shortage of 11 nurse anesthetist exist. The WISN ratio of 0.0 indicate that 0% of the required nurse anesthetist is available.

The 11 HCs have 114 nurses, however, WISN calculation show that only 53 nurses are required indicating that a surplus of 61 nurses exist. The WISN ratio of 2.2 indicates that 220% (120% surplus) of the required number of nurses is available.

**Table 21:** WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSE ANAESTHETIST, NURSES AND PHYSICIAN ASSISTANTS IN [MONTSERRADO COUNTY]

Health Centre	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anesthetist				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Barnersville	0	9	0.0	-9	7	2	4.2	5	2	1	2.1	2	11	3	4.5	8	0	1	0.0	-1	12	4	3.3	8	0	9	0.0	-9
Bromley	1	8	0.1	-7	2	1	3.1	1	1	1	1.2	1	6	1	21.4	5	0	1	0.0	-1	10	3	4.1	7	1	8	0.1	-7
Chocolate City	3	45	0.1	-42	6	2	4.1	4	1	1	1.3	1	5	1	10.2	4	0	1	0.0	-1	9	4	2.3	5	3	45	0.1	-42
Clara Town	2	47	0.0	-45	7	3	2.2	4	2	1	1.9	2	6	1	7.1	5	0	1	0.0	-1	11	8	1.5	3	2	47	0.0	-45
Dr Agne Varis	2	17	0.1	-15	3	1	3.6	2	2	1	2.1	2	8	1	18.6	7	0	1	0.0	-1	13	3	4.4	10	2	17	0.1	-15
Du-port Road	2	24	0.1	-22	19	6	3.4	13	0	1	0.0	0	2	1	5.7	1	0	1	0.0	-1	26	10	2.7	16	2	24	0.1	-22
Gbondoi	1	21	0.1	-20	2	1	5.7	1	1	1	1.0	1	1	1	5.9	0	0	1	0.0	-1	2	2	1.3	0	1	21	0.1	-20
New Georgia	1	11	0.1	-10	6	2	3.6	4	1	1	1.8	1	2	1	6.9	1	0	1	0.0	-1	13	4	3.3	9	1	11	0.1	-10
Nyehn	0	1	0.0	-1	3	1	4.5	2	1	1	1.0	1	4	1	14.8	3	0	1	0.0	-1	6	2	2.7	4	0	1	0.0	-1

Pipeline	0	1	0.0	-1	0	5	0.0	-5	1	1	1.3	1	2	1	3.5	1	0	1	0.0	-1	6	9	0.7	-3	0	1	0.0	-1
Soniwen	2	41	0.1	-39	6	3	1.9	3	1	1	1.3	1	9	1	12.9	8	0	1	0.0	-1	6	4	1.7	2	2	41	0.1	-39
<b>Montser rado</b>	<b>14</b>	<b>225</b>	<b>0.06</b>	<b>-211</b>	<b>61</b>	<b>27</b>	<b>2.3</b>	<b>34</b>	<b>13</b>	<b>9</b>	<b>1.4</b>	<b>4</b>	<b>56</b>	<b>13</b>	<b>4.3</b>	<b>43</b>	<b>0</b>	<b>11</b>	<b>0.0</b>	<b>-11</b>	<b>114</b>	<b>53</b>	<b>2.2</b>	<b>61</b>	<b>14</b>	<b>225</b>	<b>0.06</b>	<b>-211</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

For PAs, WISN calculation show that the HCs require 225 PAs, however, only 14 are present indicating a shortage of 211 personnel. The WISN ratio of 0.06 indicates that less than 1% of the required PAs is available.

### 3.4.1. 8 Nimba county

Table 20 below for Nimba County shows that there are 8 dispensers serving the populace in 4 HCs. The WISN calculations estimate that 5 dispensers are required, indicating that a surplus of 3 dispensers exist. The WISN ratio of 1.6 indicate that there are more dispensers (160%) in the 4 HCs than required.

For midwives, 13 personnel exist meanwhile the WISN calculate estimates that 16 midwives are required in the HCs, indicating that a shortage of 3 midwives exist. The WISN ratio of 0.8 indicate that only 80% of the required midwives is available.

**Table 22:** WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSE ANAESTHETIST, NURSES AND PHYSICIAN ASSISTANTS IN [NIMBA COUNTY]

Health Centre	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anaesthetist				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Bahn	2	1	3.2	1	1	3	0.4	-2	3	1	4.1	3	8	1	13.8	7	0	1	0.0	-1	7	3	2.2	4	0	1	0.0	-1
Kamplay	2	1	5.6	1	1	8	0.1	-7	1	1	0.7	1	4	1	16.7	3	0	3	0.0	-3	6	3	2.3	3	0	17	0.0	-17
SCHC	2	2	1.3	0	6	3	1.9	3	4	4	1.1	4	6	1	8.6	5	0	1	0.0	-1	13	7	1.9	6	6	108	0.1	102
Zekepa	2	1	4.3	1	5	2	3.1	3	2	1	1.9	2	9	1	27.3	8	0	1	0.0	-1	9	3	3.6	6	0	1	0.0	-1
<b>Nimba</b>	<b>8</b>	<b>5</b>	<b>1.6</b>	<b>3</b>	<b>13</b>	<b>16</b>	<b>0.8</b>	<b>-3</b>	<b>10</b>	<b>7</b>	<b>1.4</b>	<b>3</b>	<b>27</b>	<b>4</b>	<b>6.8</b>	<b>23</b>	<b>0</b>	<b>6</b>	<b>0.0</b>	<b>-6</b>	<b>35</b>	<b>16</b>	<b>2.2</b>	<b>19</b>	<b>6</b>	<b>127</b>	<b>0.05</b>	<b>-121</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference, SCHC: Saclepea Comprehensive Health Centre

There are 10 lab personnel serving the populace in 4 HCs. WISN calculation estimates that only 7 personnel of this cadre are required indicating a surplus of 3 staff, and a WISN ratio of 1.4 showing that there are more lab personnel than required.

WISN calculation show that a surplus of 23 nurse aides exist in the 4 HCs in Nimba. The WISN ratio of 6.8 indicate that there are more

nurse aides (580% surplus) than required for the HCs in Nimba.

No nurse anesthetist exists in all 4 HCS in the county. The WISN calculation show that 6 nurse anesthetist are required, indicating that a shortage of 6 personnel exist. The WISN ratio of 0.0 indicate that 0% of the required nurse anesthetist is available.

For nurses, the WISN calculation show that 16 nurses are required to serve in the 4 HC. However, 35 nurses exist indicating a surplus of 19 personnel under this cadre. The WISN ratio of 2.2 indicates that 220% of the required nurses is present in the 4 HCs.

Only 6 PAs exist in the 4 HC, with none available in 3 of the facilities (Bahn, Karnplay and Zekepa). The WISN calculation show that 127 PAs are required to work in these 4 HCs, indicating that a shortage of 121 personnel exist. The WISN ratio of 0.06 indicate that less than 1% of the required PA is available.

### 3.4.1. 9 Rivercess county

There is 1 dispenser providing services to the populace in Boegeezay HC in Rivercess county. WISN calculation show that 1 dispenser is required meaning the correct number of dispenser is present. The WISN ratio of 1.0 indicates that 100% of the required personnel is available.

Similarly, 1 midwife is required and 1 exist in the HC indicating no difference. The WISN ratio of 1.0 indicate that 100% of the required midwife exist.

No lab personnel exist in the Boegeezay health centre. WISN calculation reveal that one personnel of this cadre is required, indicating a shortage of one staff exist. The WISN ratio of 0.0 indicate that 0% of the required lab personnel is available.

For nurse aides, 2 staff exist in the HC while the WISN calculation estimate that just 1 is required indicating that a surplus of 1 staff exist. The WISN ratio of 2.0 indicate that 200% of required nurse aides (100% surplus) is available.

No nurse anesthetist exists in the HC. The WISN calculation show that 1 nurse anesthetist is required indicating that a shortage of 1 personnel exist. The WISN ratio of 0.0 indicate that 0% of the required nurse anesthetist is available.

**Table 23:** WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSE ANAESTHETIST, NURSES AND PHYSICIAN ASSISTANTS IN [RIVERCESS COUNTY]

Health Centre	Dispenser				Midwives				Lab				Nurse Aide				Nurse Anesthetist				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	C R	WR	W D	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Boegeezay	1	1	3.7	0	1	1	1.9	0	0	1	0.0	-1	2	1	11.1	1	0	1	0.0	-1	1	1	6.3	0	0	1	0.0	-1



For nurse anesthetist, there is no personnel in the 2 HCs. WISN calculation show that 2 personnel of this cadre are required indicating that a shortage of 2 nurse anesthetist exist. The WISN ratio of 0.0 indicate that 0% of the required personnel is available.

The WISN calculation show that a surplus of 7 nurses exist in the 2 HCs in River Gee. The WISN ratio of 2.4 indicate that there are more nurses (240%) than required.

Four (4) PA provide services to the populace in the 2 HCs in this county. WISN calculation show that 52 PAs are required, indicating that a shortage of 48 PAs exist. The WISN ratio of 0.08 indicate that just about 1% of the required PAs is available.

### 3.4.2 WISN RESULTS FOR CLINICS IN LIBERIA

Table 25: WISN RESULTS FOR DISPENSERS, MIDWIVES, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN CLINICS IN LIBERIA

COUNTIES	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WISN Difference
Lofa	37	44	0.8	-7	40	52	0.8	-12	5	18	0.3	-13	41	45	0.9	-4	57	58	0.9	-1	0	45	0.0	-45
Bomi	23	21	1.1	2	13	21	0.6	-8	10	9	1.1	1	29	21	1.4	8	42	28	1.5	14	0	21	0.0	-21
Bong	33	39	0.8	-6	45	63	0.7	-18	11	21	0.5	-10	61	39	1.6	22	59	68	0.9	-9	2	39	0.05	-37
Cape Mount	21	29	0.7	-8	15	29	0.5	-14	0	3	0.0	-3	26	27	0.9	-1	45	31	1.5	14	6	107	0.06	-101
Gbarpolu	14	12	1.2	2	7	13	0.5	-6	3	6	0.5	-3	16	13	1.2	3	18	14	1.3	4	6	100	0.06	-94
G. Bassa	17	20	0.9	-3	13	24	0.5	-11	3	9	0.3	-6	52	20	2.6	32	37	42	0.9	-5	2	61	0.03	-59
G. Gedeh	14	16	0.9	-2	18	23	0.8	-5	14	7	2.0	7	22	16	1.4	6	17	19	0.9	-2	1	24	0.04	-23
G. Kru	10	12	0.8	-2	8	12	0.7	-4	1	5	0.2	-4	28	12	2.3	16	10	12	0.8	-2	0	39	0.0	-39
Margibi	11	12	0.9	-1	10	13	0.8	-3	0	5	0.0	-5	12	12	1.0	0	21	15	1.4	6	1	27	0.04	-26
Maryland	16	17	0.9	-1	7	79	0.09	-72	9	8	1.1	1	22	17	1.3	5	25	19	1.3	6	1	34	0.03	-33
Montserrado	20	30	0.7	-10	51	36	1.4	15	2	18	0.1	-16	62	26	2.4	36	88	44	2.0	44	14	272	0.05	-258
Nimba	28	3	9.3	25	17	42	0.4	-25	11	22	0.5	-11	52	0	-	52	45	47	0.9	-2	1	51	0.02	-50
R. Gee	14	15	0.9	-1	13	15	0.9	-2	7	8	0.9	-1	34	14	2.4	20	12	17	0.7	-5	2	75	0.03	-73
Rivercess	13	12	1.1	1	8	12	0.7	-4	1	6	0.2	-5	12	12	1.0	0	15	12	1.3	3	1	39	0.03	-38
Sinoe	27	32	0.8	-5	15	34	0.4	-19	18	12	1.5	6	40	34	1.2	6	28	35	0.8	-7	2	86	0.02	-84
<b>Liberia</b>	<b>298</b>	<b>314</b>	<b>0.9</b>	<b>-16</b>	<b>280</b>	<b>468</b>	<b>0.6</b>	<b>-188</b>	<b>95</b>	<b>157</b>	<b>0.6</b>	<b>-62</b>	<b>509</b>	<b>308</b>	<b>1.7</b>	<b>201</b>	<b>519</b>	<b>461</b>	<b>1.1</b>	<b>58</b>	<b>39</b>	<b>1020</b>	<b>0.04</b>	<b>-981</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

### 3.4.2. 1 Lofa county

There are 37 dispensers serving the populace in 45 clinics in Bomi County, with 7 clinics having no dispenser. The WISN calculation show that 44 dispensers are required, indicating that a shortage of 7 dispensers exist in the public clinics in this county. WISN ratio of 0.8 indicates that only 80% of required dispensers is available.

**Table 26:** WISN RESULTS FOR DISPENSERS, LAB PERSONNEL, MIDWIVES, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Lofa County]

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Balagqalazu	1	1	8.3	0	1	1	1.7	0	0	0	0.0	0	1	1	11.1	0	1	1	1.5	0	0	1	0.0	-1
Balakpalasu	1	1	4.6	0	1	1	1.1	0	0	0	0.0	0	1	1	7.7	0	1	1	0.9	0	0	1	0.0	-1
Barkedu	1	1	2.3	0	1	2	0.6	-1	0	1	0.0	-1	1	1	4.2	0	2	2	0.9	0	0	1	0.0	-1
Barziwen	1	1	4.2	0	0	1	0.0	-1	0	1	0.0	-1	1	1	10.0	0	2	1	1.7	1	0	1	0.0	-1
Bondi	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	3	1	13.6	2	1	1	1.5	0	0	1	0.0	-1
Borkeza	1	1	2.7	0	1	1	0.8	0	0	1	0.0	-1	1	1	5.3	0	2	2	1.1	0	0	1	0.0	-1
Duogomai	1	1	5.0	0	0	1	0.0	-1	0	1	0.0	-1	1	1	14.3	0	3	1	3.0	2	0	1	0.0	-1
Fangoda	1	1	2.8	0	0	1	0.0	-1	0	1	0.0	-1	1	1	3.9	0	1	2	0.6	-1	0	1	0.0	-1
Fassavolu	1	1	3.1	0	0	1	0.0	-1	0	0	0.0	0	1	1	8.3	0	2	2	1.3	0	0	1	0.0	-1
Fissibu	1	1	3.9	0	1	2	0.7	-1	0	0	0.0	0	1	1	5.6	0	1	1	0.8	0	0	1	0.0	-1
Foya-Tengia	1	1	2.7	0	1	1	0.8	0	1	1	1.5	0	1	1	4.2	0	1	2	0.6	-1	0	1	0.0	-1
Ganglota	1	1	4.6	0	1	1	1.1	0	0	0	0.0	0	1	1	6.7	0	1	1	1.0	0	0	1	0.0	-1
Gbanway	1	1	3.9	0	1	1	1.5	0	0	1	0.0	-1	1	1	6.3	0	1	1	0.9	0	0	1	0.0	-1
Gbonyea	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	1	2	0.7	-1	0	1	0.0	-1
Gondonlahun	1	1	4.4	0	1	1	1.5	0	1	1	1.7	0	1	1	6.3	0	1	1	0.9	0	0	1	0.0	-1
Gorlu	1	1	5.6	0	1	1	1.3	0	0	0	0.0	0	1	1	8.3	0	1	1	1.1	0	0	1	0.0	-1
Kaintahun	1	1	5.6	0	1	1	1.5	0	0	1	0.0	-1	1	1	10.0	0	2	1	2.3	1	0	1	0.0	-1
Kamatahun	1	1	4.4	0	1	1	0.8	0	0	1	0.0	-1	1	1	6.7	0	1	1	0.9	0	0	1	0.0	-1
Korworhun	0	0	0.0	0	1	1	0.8	0	0	0	0.0	0	0	1	0.0	-1	1	2	0.5	-1	0	1	0.0	-1
Kpademai	1	1	5.9	0	1	1	1.6	0	0	1	0.0	-1	1	1	10.0	0	1	1	1.3	0	0	1	0.0	-1
Kpaiyea	0	1	0.0	-1	1	1	0.9	0	0	0	0.0	0	0	1	0.0	-1	1	1	1.1	0	0	1	0.0	-1
Kpakamai	1	1	4.4	0	1	1	1.5	0	0	0	0.0	0	1	1	10.0	0	2	1	1.9	1	0	1	0.0	-1



Kpayeaquell	1	1	5.6	0	1	1	1.5	0	0	0	0.0	0	1	1	9.1	0	1	1	1.2	0	0	1	0.0	-1
Kpotomai	1	1	5.6	0	1	1	1.7	0	0	0	0.0	0	1	1	5.3	0	0	1	0.0	-1	0	1	0.0	-1
Leingbamba	1	1	3.6	0	1	1	0.8	0	0	1	0.0	-1	1	1	5.3	0	1	2	0.8	-1	0	1	0.0	-1
Lukasu	1	1	3.0	0	1	1	1.2	0	0	1	0.0	-1	1	1	2.6	0	0	1	0.0	-1	0	1	0.0	-1
Luyeama	1	1	3.9	0	1	1	1.8	0	0	1	0.0	-1	1	1	6.7	0	1	1	0.9	0	0	1	0.0	-1
Mbalotahun	1	1	5.9	0	1	1	2.0	0	1	0	2.1	1	1	1	8.3	0	1	1	1.3	0	0	1	0.0	-1
Mendikorma	1	1	10.0	0	1	1	1.0	0	1	0	2.4	1	1	1	11.1	0	1	1	1.7	0	0	1	0.0	-1
Nyandemoilahun	1	1	5.3	0	1	1	1.3	0	0	1	0.0	-1	1	1	10.0	0	2	1	2.2	1	0	1	0.0	-1
Popalahun	1	1	4.2	0	2	1	3.4	1	0	1	0.0	-1	1	1	6.7	0	1	1	0.8	0	0	1	0.0	-1
Porluma	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	1	1	5.9	0	2	2	1.1	0	0	1	0.0	-1
Salayea	1	1	2.4	0	3	2	1.9	1	0	1	0.0	-1	1	1	5.6	0	2	2	1.5	0	0	1	0.0	-1
Sarkonedu	1	1	3.6	0	1	2	0.7	-1	0	1	0.0	-1	0	1	0.0	-1	1	2	0.7	-1	0	1	0.0	-1
Shello	1	1	2.8	0	1	2	0.7	-1	0	1	0.0	-1	1	1	5.6	0	2	2	1.2	0	0	1	0.0	-1
Sorlumba	1	1	5.9	0	1	2	0.7	-1	0	0	0.0	0	1	1	6.7	0	2	1	2.3	1	0	1	0.0	-1
Sucromu	1	1	2.7	0	1	1	1.5	0	0	1	0.0	-1	1	1	5.0	0	1	2	0.6	-1	0	1	0.0	-1
Torbogizizu	1	1	4.6	0	0	1	0.0	-1	0	1	0.0	-1	1	1	10.0	0	2	1	1.9	1	0	1	0.0	-1
Veza	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	1	1	6.7	0	1	1	0.9	0	0	1	0.0	-1
Worsonga	1	1	7.1	0	1	1	1.3	0	0	0	0.0	0	1	1	9.1	0	1	1	1.4	0	0	1	0.0	-1
Yarpuah	0	1	0.0	-1	2	1	2.5	1	0	0	0.0	0	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1
Yeala	1	1	7.1	0	1	1	1.8	0	0	1	0.0	-1	1	1	16.7	0	3	1	3.8	2	0	1	0.0	-1
Yekpedu	1	1	4.6	0	0	1	0.0	-1	0	1	0.0	-1	1	1	6.3	0	1	1	1.0	0	0	1	0.0	-1
Zenalormai	1	1	5.6	0	2	1	3.0	1	1	1	2.0	0	1	1	9.1	0	1	1	1.2	0	0	1	0.0	-1
Zolowo	0	1	0.0	-1	1	2	0.6	-1	0	0	0.0	0	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1
<b>Lofa</b>	<b>37</b>	<b>44</b>	<b>0.8</b>	<b>-7</b>	<b>40</b>	<b>52</b>	<b>0.8</b>	<b>-12</b>	<b>5</b>	<b>18</b>	<b>0.3</b>	<b>-13</b>	<b>41</b>	<b>45</b>	<b>0.9</b>	<b>-4</b>	<b>57</b>	<b>58</b>	<b>0.9</b>	<b>-1</b>	<b>0</b>	<b>45</b>	<b>0.0</b>	<b>-45</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

For midwives, 40 personnel are available in the public clinics in Lofa county. However, WISN calculations estimate that 52 midwives are required, indicating that a shortage of 12 midwives exist. The WISN ratio of 0.8 indicates that only 80% of required midwives is available.

There are 5 lab personnel serving the populace in 45 public clinics in Lofa. WISN calculations estimate that 18 staff are required, indicating a shortage of 13 lab personnel exist. The WISN ratio of 0.3 indicates that only 30% of the required lab workforce is available.

The WISN calculation show that 45 nurse aides are required to serve in the 45 clinics in this county, however 41 workers are available indicating that a shortage of 4 workers exist. WISN ratio of 0.9 indicates that only 90% of the required nurse aides is available.

For nurses the county has 57 staff serving in the 45 clinics. WISN calculation show that 58 nurses are required, indicating that a shortage of 1 nurse exist. WISN ratio of 0.9 also indicate that only 90% of the required nurses is available.

No PA exist in the clinics in this county. However, WISN calculation show that 45 PAs are required indicating a shortage of 45 PAs. The WISN ratio of 0.0 indicates that 0% of the required PA is available.

### 3.4.2.2 Bomi county

Table 25 shows that there are 23 dispensers providing services in 21 public clinics, meanwhile WISN calculation estimate that 21 personnel are required indicating a surplus of 2 dispensers. The WISN ratio of 1.1 indicates that 110% of the required dispensers is available.

**Table 27:** WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Bong County]

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Beafine	1	1	4.6	0	0	1	0.0	-1	2	1	3.9	1	1	1	11.1	0	4	2	3.0	2	0	1	0.0	-1
Beh Town	1	1	4.2	0	1	1	1.7	0	1	1	1.9	0	1	1	11.1	0	3	2	2.2	1	0	1	0.0	-1
Behsao	1	1	4.6	0	0	1	0.0	-1	0	0	0.0	0	1	1	9.1	0	1	2	0.8	-1	0	1	0.0	-1
Bonjeh	1	1	4.6	0	0	1	0.0	-1	0	0	0.0	0	1	1	9.1	0	2	1	1.6	1	0	1	0.0	-1
Dagweh Town	1	1	4.6	0	2	1	2.9	1	0	1	0.0	-1	1	1	9.1	0	4	2	3.1	2	0	1	0.0	-1
Fefeh Town	1	1	5.0	0	1	1	1.1	0	0	0	0.0	0	1	1	4.0	0	0	1	0.0	-1	0	1	0.0	-1
Gayah Hill	1	1	5.0	0	1	1	1.1	0	0	1	0.0	-1	2	1	13.3	1	2	1	1.7	1	0	1	0.0	-1
Goghen	1	1	6.3	0	0	1	1.8	-1	1	0	2.2	1	1	1	11.1	0	1	1	1.1	0	0	1	0.0	-1
Golodee Lansanah	1	1	5.9	0	1	1	0.0	0	0	0	0.0	0	1	1	9.1	0	1	1	1.0	0	0	1	0.0	-1
Gonjeh	3	1	14.3	2	1	1	2.1	0	0	1	0.0	-1	3	1	16.7	2	1	1	0.9	0	0	1	0.0	-1
Gonzipo	1	1	5.6	0	1	1	2.1	0	0	0	0.0	0	2	1	15.4	1	2	1	2.1	1	0	1	0.0	-1
Jenneh#3	1	1	3.5	0	0	1	0.0	-1	0	1	0.0	-1	1	1	5.3	0	1	2	0.6	-1	0	1	0.0	-1
Malema	1	1	5.6	0	0	1	0.0	-1	1	1	1.9	0	1	1	8.3	0	1	1	1.0	0	0	1	0.0	-1
Mecca	1	1	4.8	0	1	1	1.6	0	0	0	0.0	0	1	1	10.0	0	3	1	2.5	2	0	1	0.0	-1
Sackie Town	1	1	5.9	0	0	1	0.0	-1	2	0	4.6	2	3	1	23.1	2	3	1	2.8	2	0	1	0.0	-1
Sass Town	1	1	3.9	0	1	1	1.0	0	0	1	0.0	-1	1	1	5.3	0	1	2	0.8	-1	0	1	0.0	-1

Suehn	1	1	2.6	0	0	1	0.0	-1	1	1	1.9	0	2	1	10.0	1	4	2	2.1	2	0	1	0.0	-1
Vortor	1	1	8.3	0	2	1	3.8	1	1	0	2.4	1	1	1	8.3	0	1	1	1.5	0	0	1	0.0	-1
Weawolo	1	1	5.9	0	0	1	0.0	-1	0	0	0.0	0	2	1	14.3	1	2	1	3.5	1	0	1	0.0	-1
Yomo	1	1	4.6	0	1	1	0.0	0	0	0	0.0	0	1	1	13.3	0	1	1	1.7	0	0	1	0.0	-1
Zordee	1	1	7.1	0	0	1	2.0	-1	1	1	2.0	1	1	1	11.1	0	4	1	1.3	3	0	1	0.0	-1
<b>Bomi</b>	<b>23</b>	<b>21</b>	<b>1.1</b>	<b>2</b>	<b>13</b>	<b>21</b>	<b>0.6</b>	<b>-8</b>	<b>10</b>	<b>9</b>	<b>1.1</b>	<b>1</b>	<b>29</b>	<b>21</b>	<b>1.4</b>	<b>8</b>	<b>42</b>	<b>28</b>	<b>1.5</b>	<b>14</b>	<b>0</b>	<b>21</b>	<b>0.0</b>	<b>-21</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

For midwives, 13 staff are providing care in all the clinics, with 10 clinics having no midwife. The WISN calculation estimates that 21 personnel of this cadre are available indicating a current shortage of 8 staff, and the WISN ratio of 0.6 indicating that just 60% of the required midwives is available.

There are 10 lab personnel in the county public clinics. WISN calculations estimate that 9 personnel are required, indicating that a surplus of 1 personnel exist. The WISN ratio of 1.1 indicate that more lab personnel are available than required.

Twenty-nine (29) nurse aides exist, whereas WISN calculation show that 21 staff are required which indicate a current surplus of 8 personnel. The WISN ratio of 1.4 reveal that 140% of the required nurse aide is available.

There are 42 nurses currently providing care in the public clinics, however, WISN estimates that just 28 are required indicating that a surplus of 14 staff exist. The WISN ratio of 1.5 indicates that 150% of the required nurses is available.

The county has no PA, meanwhile WISN estimates that 21 PAs are required indicating a shortage of 21 personnel. The WISN ratio of 0.0 indicates that 0% of the required staff is available.

### 3.4.2.3 Bong county

Table 25 below for Bong County shows that there are 33 dispensers providing services to the populace in 39 Clinics in Bong County. WISN calculation show that 39 dispensers are required indicating that a shortage of 6 dispensers exist, and the WISN ratio of 0.8 indicating that only 80% of the required dispensers is available

There are 45 midwives serving in the 39 clinics, with 9 clinics having no midwife. The WISN calculation show that 63 midwives are required, indicating that a shortage of 18 midwives exist. The WISN ratio of 0.7 indicates that only 70% of the required midwives is available.

**Table 28:** WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Bong County]

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Fenutoli	1	1	3.9	0	1	1	0.9	0	1	1	1.9	0	2	1	11.1	1	2	1	1.6	1	0	1	0.0	-1
Gbarnia	1	1	5.9	0	1	1	0.9	0	1	0	2.1	1	2	1	11.1	1	1	1	1.2	0	0	1	0.0	-1
Gbonota	1	1	3.1	0	2	2	1.3	0	0	0	0.0	0	2	1	8.0	1	2	2	1.0	0	0	1	0.0	-1
Kelebei	1	1	5.3	0	1	2	0.7	-1	0	0	0.0	0	2	1	12.5	1	2	1	2.2	1	0	1	0.0	-1
Haindi	1	1	3.9	0	0	1	0.0	-1	1	1	1.4	0	0	1	0.0	-1	1	1	0.8	0	0	1	0.0	-1
Rock Chorsher	1	1	3.9	0	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	1	1	0.8	0	0	1	0.0	-1
Salala	1	1	1.7	0	2	3	0.8	-1	0	1	0.0	-1	2	1	4.4	1	3	3	1.1	0	0	1	0.0	-1
Sonoyea	1	1	2.3	0	2	2	0.9	0	1	1	1.3	0	2	1	4.6	1	1	2	0.5	-1	0	1	0.0	-1
Takpaitolu	1	1	4.4	0	0	1	0.0	-1	0	1	0.0	-1	2	1	11.8	1	2	1	1.8	1	0	1	0.0	-1
Totota	1	1	1.6	0	2	3	0.7	-1	1	1	2.0	1	1	1	1.6	0	1	3	0.4	-2	0	1	0.0	-1
Zeanzue	1	1	2.3	0	1	2	0.6	-1	1	1	1.7	0	2	1	6.9	1	3	2	1.5	1	0	1	0.0	-1
Bah-Ta	1	1	3.3	0	2	2	1.4	0	0	1	0.0	-1	3	1	10.3	2	1	1	0.8	0	0	1	0.0	-1
Belefanah	1	1	1.7	0	1	2	0.7	-1	0	0	0.0	0	3	1	9.7	2	4	3	1.6	1	0	1	0.0	-1
Beletanda	0	1	0.0	-1	0	2	0.0	-2	1	1	1.7	0	0	1	0.0	-1	1	1	1.2	0	0	1	0.0	-1
Bellemu	1	1	5.9	0	1	1	1.0	0	0	1	0.0	-1	2	1	13.3	1	1	1	1.3	0	1	1	4.4	0
Botota	1	1	2.3	0	2	1	2.1	1	0	0	0.0	0	2	1	5.4	1	1	2	0.6	-1	0	1	0.0	-1
Boway	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	1	2	0.7	-1	0	1	0.0	-1
Degei	1	1	2.5	0	1	1	0.8	0	0	1	0.0	-1	2	1	6.7	1	1	2	0.6	-1	0	1	0.0	-1
Foequleh	1	1	2.9	0	2	2	1.4	0	0	1	0.0	-1	3	1	12.5	2	3	2	2.0	1	0	1	0.0	-1
Garmue	1	1	3.1	0	1	2	0.7	-1	0	1	0.0	-1	2	1	8.3	1	2	2	1.3	0	0	1	0.0	-1
Gbalatuah	1	1	2.3	0	1	2	0.8	-1	0	1	0.0	-1	1	1	3.9	0	1	2	0.5	-1	0	1	0.0	-1
Gbasulomah	1	1	2.8	0	1	1	1.2	0	0	1	0.0	-1	1	1	4.8	0	1	2	0.6	-1	0	1	0.0	-1
Gbecohn	1	1	5.0	0	3	2	2.1	1	1	1	1.9	0	2	1	10.0	1	1	1	1.1	0	0	1	0.0	-1
Janyea	1	1	3.3	0	1	1	1.0	0	0	1	0.0	-1	1	1	5.0	0	1	2	0.7	-1	0	1	0.0	-1
Jorwah	1	1	2.4	0	1	1	1.1	0	1	1	1.9	0	3	1	10.3	2	2	2	1.5	0	0	1	0.0	-1
Kpaai	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	1	1	10.0	0	1	1	1.3	0	0	1	0.0	-1
Mainowainsue	0	1	0.0	-1	1	1	1.3	0	0	1	0.0	-1	2	1	13.3	1	1	1	1.1	0	0	1	0.0	-1
Naama	1	1	2.5	0	1	2	0.6	-1	0	1	0.0	-1	1	1	3.7	0	1	2	0.6	-1	0	1	0.0	-1
Nyarta	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	1	2	0.8	-1	0	1	0.0	-1

Palala	2	1	3.5	1	4	3	1.5	1	0	1	0.0	-1	4	1	7.8	3	2	3	0.8	-1	0	1	0.0	-1
Samay	1	1	3.5	0	1	2	0.6	-1	1	1	1.7	0	1	1	4.0	0	1	2	0.8	-1	0	1	0.0	-1
Shankpallai	0	1	0.0	-1	1	1	1.1	0	0	1	0.0	-1	0	1	0.0	-1	1	2	0.6	-1	0	1	0.0	-1
Tamayta	1	1	1.7	0	2	2	1.1	0	0	1	0.0	-1	1	1	3.9	0	4	3	1.5	1	0	1	0.0	-1
Gbartala	1	1	1.7	0	1	2	0.5	-1	0	1	0.0	-1	1	1	3.9	0	1	3	0.4	-2	0	1	0.0	-1
Wainsue	1	1	4.6	0	2	2	1.2	0	0	1	0.0	-1	1	1	5.9	0	1	1	1.5	0	0	1	0.0	-1
Yila	1	1	5.6	0	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	1	1	1.0	0	0	1	0.0	-1
Yolota	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	1	1	6.7	0	1	1	1.0	0	0	1	0.0	-1
Zebbay	1	1	3.2	0	1	2	0.7	-1	1	1	1.9	0	3	1	12.5	2	2	2	1.5	0	0	1	0.0	-1
Zoweineta	1	1	4.2	0	2	2	1.4	0	0	1	0.0	-1	3	1	11.5	2	1	1	0.9	0	1	1	4.4	0
<b>Bong</b>	<b>33</b>	<b>39</b>	<b>0.8</b>	<b>-6</b>	<b>45</b>	<b>63</b>	<b>0.7</b>	<b>-18</b>	<b>11</b>	<b>21</b>	<b>0.5</b>	<b>-10</b>	<b>61</b>	<b>39</b>	<b>1.6</b>	<b>22</b>	<b>59</b>	<b>68</b>	<b>0.9</b>	<b>-9</b>	<b>2</b>	<b>39</b>	<b>0.05</b>	<b>-37</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

The county has 11 lab personnel serving the population in 39 public clinics. WISN calculations estimate that 21 lab technicians and assistants are required, indicating that a shortage of 10 lab personnel exist. The WISN ratio of 0.5 indicates that 50% of the required lab staff is available.

For nurse aides, the WISN calculation shows that 39 personnel are required, however 61 nurse aides are present in the 39 clinics indicating that a surplus of 22 nurse aides exist. The WISN ratio of 1.6 indicates that 160% of the required nurse aides is available.

There are 59 nurses serving the population in the clinics, however WISN calculation show that 68 nurses are required indicating that a shortage of 9 nurses exist. The WISN ratio of 0.9 indicates that 90% of the required nurses is available.

The county has 2 PAs working in the 39 clinics, with no PA in 37 of the facilities. WISN calculation reveals that 39 PAs are required indicating that a shortage of 37 PAs exist. The WISN ratio of 0.05 indicates that less than 1% of the required PAs is available.

#### 3.4.2.4 Grand Cape Mount county

There are 21 dispensers serving the populace in 29 clinics in GCM County, with 8 clinics having no dispenser. WISN calculation show that 29 dispensers are required indicating that a shortage of 8 dispensers exist. The WISN ratio of 0.7 indicates that 70% of the required dispenser is available.

WISN calculation show that 29 midwives are required in the 29 clinics, however just 15 midwives exist (14 clinics without a midwife) indicating a shortage of 14 midwives. The WISN ratio of 0.5 show that just 50% of the required midwife is available.

Table 29: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Grand Cape Mount County]

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Bamballa	1	1	5.6	0	1	1	1.1	0	0	0	0.0	0	1	1	6.3	0	1	1	1.8	0	1	15	0.1	-14
Bangorma	1	1	8.3	0	1	1	1.3	0	0	0	0.0	0	1	1	8.3	0	1	1	1.6	0	0	1	0.1	-1
Bendaja	1	1	3.7	0	0	1	0.0	-1	0	0	0.0	0	1	1	5.3	0	1	1	0.8	0	0	1	0.0	-1
Bendu	1	1	10.0	0	1	1	2.2	0	0	0	0.0	0	1	1	16.7	0	2	1	3.5	1	0	1	0.0	-1
Bomboja	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	1	1	10.0	0	1	1	1.3	0	0	1	0.0	-1
Diah	1	1	5.9	0	0	1	0.0	-1	0	0	0.0	0	1	1	11.1	0	2	1	2.4	1	1	10	0.1	-9
Fahnja	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	1	1	12.5	0	1	1	1.6	0	0	1	0.0	-1
Fanti Town	1	1	5.0	0	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	2	1	1.9	1	1	17	0.0	-16
Gondama	1	1	8.3	0	1	1	0.0	0	0	0	0.0	0	1	1	8.3	0	1	1	2.3	0	0	1	0.1	-1
Gonelor	0	1	0.0	-1	1	1	1.5	0	0	0	0.0	0	0	1	0.0	-1	1	1	1.1	0	0	1	0.0	-1
Jene Wonde	1	1	10.0	0	0	1	1.0	-1	0	0	0.0	0	1	1	8.3	0	0	1	0.0	-1	0	1	0.1	-1
Jundu	1	1	7.1	0	2	1	1.2	1	0	0	0.0	0	1	1	14.3	0	3	1	3.9	2	0	1	0.0	-1
Karnga	1	1	7.1	0	0	1	0.0	-1	0	0	0.0	0	1	1	25.0	0	3	1	3.9	2	0	1	0.0	-1
Kawelahum	0	1	0.0	-1	0	1	2.6	-1	0	1	0.0	-1	1	1	10.0	0	1	1	1.5	0	0	1	0.0	-1
Kinjor	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	1	3	0.4	-2	0	1	0.0	-1
Kongo Mano Rever	0	1	0.0	-1	1	1	0.0	0	0	0	0.0	0	1	1	10.0	0	1	1	1.6	0	0	1	0.0	-1
Kpeneji	1	1	5.6	0	2	1	0.0	1	0	0	0.0	0	1	0	0.0	1	2	1	12.5	1	0	1	0.0	-1
Kulangor	1	1	8.3	0	1	1	0.8	0	0	0	0.0	0	1	1	12.5	0	2	1	3.0	1	0	1	0.1	-1
Lofa Bridge	1	1	2.4	0	0	1	1.3	-1	0	0	0.0	0	1	0	0.0	1	2	1	12.5	1	1	15	0.0	-14
Madina	1	1	3.5	0	0	1	1.8	-1	0	0	0.0	0	1	1	6.7	0	1	1	0.8	0	0	1	0.0	-1
Mambo	1	1	5.6	0	0	1	0.0	-1	0	0	0.0	0	1	1	12.5	0	2	1	2.2	1	0	1	0.1	-1
M'baloma	1	1	4.6	0	0	1	0.0	-1	0	0	0.0	0	1	1	8.3	0	2	1	1.8	1	0	1	0.0	-1
Sembehum	1	1	10.0	0	0	1	0.0	-1	0	0	0.0	0	1	1	16.7	0	2	1	3.4	1	0	1	0.0	-1
Tahn Gola Konneh	0	1	0.0	-1	1	1	0.0	0	0	1	0.0	-1	1	1	5.9	0	1	1	0.8	0	1	10	0.0	-9
Tahn Mafa	1	1	10.0	0	0	1	0.0	-1	0	0	0.0	0	1	1	14.3	0	2	1	3.4	1	0	1	0.1	-1
Tallah	0	1	0.0	-1	1	1	0.9	0	0	0	0.0	0	1	1	14.3	0	1	1	1.8	0	1	17	0.0	-16
Tienii	1	1	5.9	0	1	1	0.0	0	0	0	0.0	0	1	1	11.1	0	3	1	3.4	2	0	1	0.1	-1
Varguaye	1	1	4.8	0	1	1	2.5	0	0	0	0.0	0	1	1	10.0	0	2	1	1.9	1	0	1	0.0	-1
Zaway	1	1	7.1	0	0	1	1.1	-1	0	0	0.0	0	1	1	12.5	0	1	1	1.4	0	0	1	0.0	-1
<b>Grand Cape Mount</b>	<b>21</b>	<b>29</b>	<b>0.7</b>	<b>-8</b>	<b>15</b>	<b>29</b>	<b>0.5</b>	<b>-14</b>	<b>0</b>	<b>3</b>	<b>0.0</b>	<b>-3</b>	<b>26</b>	<b>27</b>	<b>0.9</b>	<b>-1</b>	<b>45</b>	<b>31</b>	<b>1.5</b>	<b>14</b>	<b>6</b>	<b>107</b>	<b>0.06</b>	<b>-101</b>

*ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference*

The county public clinics have no lab personnel. WISN calculations reveal that 3 lab personnel are required, indicating that a shortage of 3 personnel exist in GCM county. The WISN ratio of 0.0 indicate that 0% of the required lab personnel is available.

There are 26 nurse aides in the clinics, meanwhile WISN calculation show that 27 personnel are required indicating that a shortage of 1 nurse aide exist. The WISN ratio of 0.9 indicates that 90% of the required nurse aide is available.

For nurses, the WISN calculation show that 31 nurses are required in the 29 clinics. However, 45 nurses actually exist indicating a surplus of 14 nurses. The WISN ratio of 1.5 indicates that 150% of the required nurses is available.

There are just 6 PAs serving the 29 clinics in the county. WISN calculation show that 107 PAs are required indicating that a shortage of 110 PAs exist. The WISN ratio of 0.06 indicates that less than 1% of the required PAs is available.

#### **3.4.2.5 Gbarpolu county**

Table 27 below shows that there are 14 dispensers providing services in the 13 clinics (2 clinics with no dispenser) in Gbarpolu County. WISN calculation show that 12 dispensers are required, indicating that a surplus of 2 dispensers exist. The WISN ratio of 1.2 indicates that 120% of the required dispensers is available.

There are 7 midwives providing services to the populace in the 13 clinics in Gbarpolu, with 7 clinics with no midwife. WISN calculation show that 13 midwives are required, indicating that a shortage of 6 midwives exist. The WISN ratio of 0.5 indicate that only 50% of the required midwife is available.

For lab personnel (technicians and assistants), 3 staff exist in the 13 clinics. WISN calculation estimate that 6 lab personnel are required, indicating that a shortage of 3 staff exist. The WISN ratio of 0.5 show that 50% of the required is available.

**Table 30: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Gbarpolu County]**

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Bambutu	2	1	12.5	1	0	1	0.0	-1	0	1	0.0	-1	2	1	20.0	1	2	1	2.6	1	0	1	0.0	-1
Fassama Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	1	1	0.9	0	1	14	0.1	-13
Gbangay Clinic	1	1	2.9	0	1	1	0.9	0	0	1	0.0	-1	1	1	6.3	0	2	2	1.3	0	1	17	0.1	-16
Gbarma Clinic	1	1	3.5	0	1	1	1.3	0	1	1	1.6	0	1	1	5.3	0	1	1	0.8	0	0	1	0.0	-1
Gbaryamah	2	1	12.5	1	2	1	3.4	1	1	0	2.1	1	1	1	12.5	0	2	1	2.5	1	0	1	0.0	-1
Gokalla	1	1	5.3	0	1	1	1.7	0	0	1	0.0	-1	2	1	13.3	1	1	1	1.2	0	0	1	0.0	-1
Henry Town	1	1	3.9	0	0	1	0.0	-1	0	1	0.0	-1	1	1	10.0	0	3	1	2.5	2	0	1	0.0	-1
Kpayekwelleh Clinic	1	1	5.9	0	0	1	0.0	-1	0	1	0.0	-1	1	1	6.3	0	1	1	1.9	0	1	14	0.1	-13
Kungbor Clinic	0	0	0.0	0	0	1	0.0	-1	0	0	0.0	0	2	1	4.4	1	0	1	0.0	-1	1	14	0.1	-13
Tarkpoima Clinic	2	1	10.0	1	1	1	1.9	0	0	0	0.0	0	1	1	7.7	0	1	1	1.6	0	1	17	0.1	-16
Totoquelleh Clinic	1	1	4.4	0	1	1	2.4	0	1	1	1.6	0	1	1	6.7	0	1	1	0.9	0	0	1	0.0	-1
Weasua Clinic	1	1	5.3	0	0	1	0.0	-1	0	1	0.0	-1	2	1	11.8	1	1	1	1.1	0	1	17	0.1	-16
Yangaya Clinic	1	1	5.6	0	0	1	0.0	-1	0	1	0.0	-1	1	1	11.1	0	2	1	2.3	1	0	1	0.0	-1
<b>Gbarpolu</b>	<b>14</b>	<b>12</b>	<b>1.2</b>	<b>2</b>	<b>7</b>	<b>13</b>	<b>0.5</b>	<b>-6</b>	<b>3</b>	<b>6</b>	<b>0.5</b>	<b>-3</b>	<b>16</b>	<b>13</b>	<b>1.2</b>	<b>3</b>	<b>18</b>	<b>14</b>	<b>1.3</b>	<b>4</b>	<b>6</b>	<b>100</b>	<b>0.06</b>	<b>-94</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

For nurse aides, the clinics have 16 personnel. However, WISN calculation show that just 13 nurse aides are required indicating that a surplus of 3 nurse aides exist. The WISN ratio of 1.2 indicates that 120% of the required nurse aides is available (surplus of 20%).

There are 18 nurses in the 13 clinics (with 1 clinic without a nurse), whereas WISN calculation show that only 14 nurses are required indicating that a surplus of 4 nurses exist. The WISN ratio of 1.3 indicates that 130% of the required personnel of this cadre is available.

WISN calculation show that 100 PAs are required to serve in the 13 clinics in this county. However, just 6 PAs exist indicating a shortage of 94 PAS. The WISN ratio of 0.06 indicates that less than 1% of the required PAs is available.



### 3.4.2.6 Grand Bassa county

Table 28 below for Grand Bassa County shows that there are 17 dispensers serving in the 20 clinics in the county, with no dispenser in 3 clinics. The WISN calculation estimates that 20 dispensers are required indicating that a shortage of 3 dispensers exist. The WISN ratio of 0.9 indicates that 90% of the required personnel of this cadre is available.

There are 13 midwives in the 20 clinics (9 clinics have no midwife), meanwhile the WISN calculation show that 24 midwives are required indicating that a shortage of 11 midwives exist. The WISN ratio of 0.5 indicates that just 50% of the required midwives is available.

Three lab personnel are serving in the 20 public clinics in Grand Bassa. WISN calculations estimate that 9 lab technicians/assistants are required, indicating that a shortage of 6 staff of this cadre exist. The WISN ratio of 0.3 indicate that only 30% of required lab personnel is available.

For nurse aides, there are 52 personnel in the clinics. However, WISN calculation show that only 20 staff are required indicating a surplus of 32 nurse aides. The WISN ratio of 2.6 indicates that 260% of the required nurse aides is available.

**Table 31: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Grand Bassa County]**

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assis		
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	W
Barconnie	1	1	3.6	0	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	1	2	0.7	-1	0	1	0.0
Barseegia	1	1	5.3	0	0	1	0.0	-1	0	0	0.0	0	3	1	13.6	2	1	1	1.2	0	0	1	0.0
Boeglay Town	1	1	2.1	0	0	1	0.0	-1	0	0	0.0	0	2	1	5.1	1	1	3	0.4	-2	0	1	0.0
Bokay Town	1	1	1.7	0	1	1	0.7	0	0	0	0.0	0	1	1	3.6	0	2	3	0.8	-1	0	1	0.0
Ceegbah	1	1	2.5	0	0	1	0.0	-1	1	0	2.2	1	3	1	10.0	2	2	1	1.6	1	1	22	0.7
Compound #2	1	1	2.6	0	1	1	0.9	0	0	1	0.0	-1	3	1	10.3	2	3	2	1.8	1	0	1	0.0
Compound #3	0	1	0.0	-1	1	2	0.5	-1	0	1	0.0	-1	2	1	5.1	1	3	4	0.9	-1	0	1	0.0
Compound #4	1	1	3.1	0	0	1	0.0	-1	0	0	0.0	0	1	1	50.0	0	1	2	0.6	-1	0	1	0.0
Desoe Town	1	1	3.2	0	1	1	1.2	0	0	0	0.0	0	3	1	11.1	2	1	2	0.8	-1	0	1	0.0
Edina	1	1	3.9	0	0	2	0.0	-2	0	1	0.0	-1	3	1	14.3	2	2	1	1.7	1	0	1	0.0
Gardour	1	1	4.6	0	0	1	0.0	-1	0	1	0.0	-1	3	1	10.3	2	0	1	0.0	-1	0	1	0.0
Jacob Larteh	1	1	4.2	0	1	1	1.5	0	0	0	0.0	0	2	1	13.3	1	3	1	2.6	2	0	1	0.0
Little Bassa	0	1	0.0	-1	0	1	0.0	-1	1	1	2.0	1	0	1	0.0	-1	0	2	0.0	-2	0	1	0.0
Little Kola	1	1	3.2	0	2	1	2.1	1	0	1	0.0	-1	2	1	10.5	1	3	2	2.1	1	0	1	0.0

Loydsville	1	1	2.8	0	1	1	1.0	0	1	1	1.9	0	1	1	6.3	0	3	2	1.7	1	0	1	0.0
Owensgrove	1	1	2.0	0	2	2	1.5	0	0	1	0.0	-1	1	1	5.6	0	3	2	1.6	1	1	21	0.0
St. John	1	1	1.7	0	1	2	0.5	-1	0	1	0.0	-1	20	1	46.5	19	2	3	0.8	-1	0	1	0.0
Sue Town	1	1	5.9	0	0	1	0.0	-1	0	0	0.0	0	1	1	10.0	0	3	3	1.1	0	0	1	0.0
Tubmanville	0	1	0.0	-1	1	1	1.6	0	0	0	0.0	0	0	1	0.0	-1	2	3	0.8	-1	0	1	0.0
Zondo Mission	1	1	2.5	0	1	1	0.9	0	0	1	0.0	-1	1	1	3.9	0	1	2	0.6	-1	0	1	0.0
<b>Grand Bassa</b>	<b>17</b>	<b>20</b>	<b>0.9</b>	<b>-3</b>	<b>13</b>	<b>24</b>	<b>0.5</b>	<b>-11</b>	<b>3</b>	<b>9</b>	<b>0.3</b>	<b>-6</b>	<b>52</b>	<b>20</b>	<b>2.6</b>	<b>32</b>	<b>37</b>	<b>42</b>	<b>0.9</b>	<b>-5</b>	<b>2</b>	<b>61</b>	<b>0.03</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

There are 37 nurses serving in the 20 clinics in county, meanwhile 42 nurses are required as shown by WISN calculation indicating that a shortage of 5 nurses exist. The WISN ratio of 0.9 indicates that 90% of the required nurses is available.

The county has just 2 PAs serving in its 20 clinics (18 clinics have no PA). WISN calculation estimates that 61 PAs are required indicating that a shortage of 59 nurses exist. The WISN ratio of 0.03 indicates that less than 1% of the required PAs is available.

### 3.4.2.7 Grand Gedeh county

Table 29 shows that there are 14 dispensers in Grand Gedeh County providing services to the populace in 16 clinics. WISN calculation estimates that 16 dispensers are required indicating that a shortage of 2 dispensers exist. The WISN ratio of 0.9 indicates that 90% of the required personnel of this care is available.

There are 18 midwives in 16 clinics (with 2 clinics with no midwife). WISN calculations estimate that 23 midwives are required indicating a shortage of 5 midwives. The WISN ratio of 0.8 indicates that 80% of the required midwives is available in the county's clinics.

Table 32: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Grand Gedeh County]

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician As		
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	W
Bargblor	1	1	7.7	0	1	1	1.3	0	1	0	2.3	1	1	1	11.1	0	1	1	1.5	0	0	1	0.0
Duogee	1	1	3.7	0	1	2	0.7	-1	0	0	0.0	0	1	1	5.3	0	1	1	0.8	0	0	1	0.0
Gbarzon Clinic	1	1	4.2	0	1	1	1.1	0	1	1	1.6	0	1	1	6.3	0	1	1	0.9	0	0	1	0.0
Gbo-Geewon	1	1	4.6	0	1	1	1.4	0	0	1	0.0	-1	1	1	8.3	0	1	1	1.0	0	0	1	0.0
Gboleken	1	1	4.6	0	1	1	1.1	0	1	1	1.7	0	1	1	10.0	0	2	1	1.8	1	0	1	0.0
Gorbowrogba	1	1	9.1	0	1	1	0.9	0	1	0	2.2	1	2	1	20.0	1	1	1	1.8	0	0	1	0.0

Janzon	1	1	3.5	0	1	1	0.9	0	1	1	1.7	0	1	1	5.6	0	1	2	0.7	-1	0	1	0.0
Karlorwleh	1	1	3.6	0	1	2	0.6	-1	1	1	1.9	0	3	1	11.5	2	1	1	0.9	0	0	1	0.0
Kumah Town	1	1	4.2	0	1	1	0.9	0	1	0	2.4	1	1	1	9.1	0	2	1	1.7	1	0	1	0.0
Polar Town	0	1	0.0	-1	0	2	0.0	-2	0	0	0.0	0	1	1	3.7	0	0	1	0.0	-1	0	1	0.0
Putu Jarwodee	1	1	5.6	0	1	2	0.6	-1	1	1	2.0	0	1	1	6.7	0	1	1	1.2	0	0	1	0.0
Putu Pennokon	1	1	2.7	0	2	2	1.1	0	2	1	2.9	1	1	1	4.0	0	1	2	0.6	-1	0	1	0.0
Toe Town	1	1	2.6	0	3	2	1.8	1	2	1	2.4	1	2	1	6.7	1	1	2	0.6	-1	0	1	0.0
Tofoi	1	1	5.9	0	2	1	3.1	1	0	0	0.0	0	1	1	9.1	0	1	1	1.2	0	0	1	0.0
Tuzon	1	1	5.9	0	1	1	1.7	0	2	0	4.2	2	2	1	20.0	1	2	1	3.3	1	1	9	0.0
Zai Town	0	1	0.0	-1	0	2	0.0	-2	0	0	0.0	0	2	1	7.1	1	0	1	0.0	-1	0	1	0.0
<b>Grand Gedeh</b>	<b>14</b>	<b>16</b>	<b>0.9</b>	<b>-2</b>	<b>18</b>	<b>23</b>	<b>0.8</b>	<b>-5</b>	<b>14</b>	<b>7</b>	<b>2.0</b>	<b>7</b>	<b>22</b>	<b>16</b>	<b>1.4</b>	<b>6</b>	<b>17</b>	<b>19</b>	<b>0.9</b>	<b>-2</b>	<b>1</b>	<b>24</b>	<b>0.0</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

There are 14 lab personnel in the 16 public clinics in this county. WISN calculations estimate that 7 staff of this cadre are required indicating that a surplus of 7 personnel exist. The WISN ratio of 2.0 shows that more lab personnel exist than required.

For nurse aides, 22 personnel exist, but WISN estimates that only 16 personnel of this cadre is required indicating a surplus of 6 staff. The WISN ratio of 1.4 indicates that 140% of the required nurse aides is available.

There are 17 nurses providing care in the 16 clinics (2 clinics have no nurse), however, WISN calculation show that 19 nurses are required indicating a shortage of 2 nurses. The WISN ratio of 0.9 indicates that 90% of the required nurses is available.

There is just one PA in the county clinics, meanwhile the WISN calculation shows that 24 PAs are required indicating that a shortage of 23 PAs exist. The WISN ratio of 0.04 indicates that less than 1% of the required PA in this county is available.

### 3.4.2.8 Grand Kru county

Table 30 shows that 10 dispensers are providing services in the 12 public clinics in Grand Kru county, with no dispenser in 2 clinics. WISN calculation show that 12 dispensers are required indicating that a shortage of 2 dispensers exist. The WISN ratio of 0.8 indicates that 80% of the required dispensers is available.

There are 8 midwives serving the populace in the 12 public clinics (no midwives in 4 clinics). WISN calculation estimates that 12 midwives are required indicating that a shortage of 4 midwives exist. The WISN ratio of 0.7 indicates that 70% of the required staff is available.

There is one lab personnel serving the populace in the 12 public clinics in Grand Kru. WISN calculation estimates that 5 lab personnel are required, indicating that a shortage of 4 staff exist. The WISN ratio of 0.2 indicates that only 20% of the required lab workforce is available.

Twenty-eight (28) nurse aides serve in the 12 clinics, but the WISN calculation estimates that just 12 nurse aides are required indicating that a surplus of 16 nurse aides exist. The WISN ratio of 2.3 indicates that 230% of the required nurse aides is available.

**Table 33: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Grand Kru County]**

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Dwehken	1	1	5.0	0	1	1	1.7	0	0	1	0.0	-1	2	1	11.8	1	1	1	1.1	0	0	28	0.0	-28
Garraway	1	1	2.7	0	1	1	1.0	0	0	1	0.0	-1	2	1	7.4	1	1	1	0.7	0	0	1	0.0	-1
Gbalakpo	1	1	4.8	0	1	1	1.8	0	0	0	0.0	0	1	1	8.3	0	1	1	1.0	0	0	1	0.0	-1
Gbanken	1	1	4.4	0	1	1	0.8	0	0	1	0.0	-1	3	1	14.3	2	1	1	1.0	0	0	1	0.0	-1
Gblebo	1	1	4.2	0	0	1	0.0	-1	1	1	1.7	0	3	1	14.3	2	1	1	1.0	0	0	1	0.0	-1
Genoyah	1	1	5.3	0	1	1	1.1	0	0	0	0.0	0	2	1	12.5	1	1	1	1.1	0	0	1	0.0	-1
Judokuken	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	3	1	18.8	2	1	1	1.0	0	0	1	0.0	-1
Newaken	0	1	0.0	-1	1	1	1.0	0	0	0	0.0	0	4	1	23.5	3	0	1	0.0	-1	0	1	0.0	-1
Nifa	1	1	6.3	0	0	1	0.0	-1	0	0	0.0	0	4	1	23.5	3	0	1	0.0	-1	0	1	0.0	-1
Niful	1	1	7.1	0	1	1	1.0	0	0	0	0.0	0	2	1	10.5	1	0	1	0.0	-1	0	1	0.0	-1
Nyankupo	1	1	4.4	0	0	1	0.0	-1	0	0	0.0	0	1	1	8.3	0	2	1	1.8	1	0	1	0.0	-1
Picnicess	1	1	3.5	0	1	1	0.6	0	0	0	0.0	0	1	1	5.9	0	1	1	0.7	0	0	1	0.0	-1
<b>Grand Kru</b>	<b>10</b>	<b>12</b>	<b>0.8</b>	<b>-2</b>	<b>8</b>	<b>12</b>	<b>0.7</b>	<b>-4</b>	<b>1</b>	<b>5</b>	<b>0.2</b>	<b>-4</b>	<b>28</b>	<b>12</b>	<b>2.3</b>	<b>16</b>	<b>10</b>	<b>12</b>	<b>0.8</b>	<b>-2</b>	<b>0</b>	<b>39</b>	<b>0.0</b>	<b>-39</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

The county has 10 nurses serving in its public clinics, with 3 clinics having no nurse. WISN calculation show that 12 nurses are required indicating a shortage of 2 nurses. The WISN ratio of 0.8 indicates that 80% of the required nurses is available.

For PAs, there is no personnel of this cadre in the 12 clinics. WISN calculation show that 39 PAs are required indicating that a shortage of 39 PAs exist. The WISN ratio of 0.0 indicates that 0% of the required physician assistants is available.

### 3.4.2.9 Margibi county

Table 31 for Margibi county shows that there are 12 dispensers serving the populace in 12 public clinics. WISN calculation estimates that 12 dispensers are required indicating that a shortage of 1 staff exist. The WISN ratio of 0.9 indicates that 90% of the required dispensers is available.

**Table 34: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Margibi County]**

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Charlesville	1	1	3.1	0	0	1	0.0	-1	0	1	0.0	-1	3	1	14.3	2	3	2	1.7	1	0	1	0.0	-1
Gbaye-ta	1	1	7.1	0	1	1	1.4	0	0	0	0.0	0	1	1	14.3	0	2	1	2.7	1	0	1	0.0	-1
Larkayta	1	1	5.6	0	0	1	0.0	-1	0	1	0.0	-1	1	1	8.3	0	1	1	1.1	0	0	1	0.0	-1
Peter Town	1	1	11.1	0	2	1	2.4	1	0	0	0.0	0	1	1	11.1	0	1	1	2.0	0	0	1	0.0	-1
Schefflin	1	1	2.4	0	0	2	0.0	-2	0	1	0.0	-1	1	1	3.9	0	2	2	1.0	0	0	1	0.0	-1
Vellayta	0	1	0.0	-1	1	1	1.3	0	0	0	0.0	0	1	1	5.0	0	0	1	0.0	-1	0	1	0.0	-1
Tuckerta	1	1	5.9	0	0	1	0.0	-1	0	0	0.0	0	1	1	5.9	0	1	1	1.2	0	0	1	0.0	-1
Wolola	1	1	3.9	0	2	1	3.3	1	0	1	0.0	-1	1	1	9.1	0	2	1	1.6	1	0	1	0.0	-1
Worhn	1	1	3.2	0	3	1	2.4	2	0	0	0.0	0	1	1	7.7	0	3	2	2.0	1	0	1	0.0	-1
Yarnwullie	1	1	7.7	0	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	3	1	4.0	2	0	1	0.0	-1
Yeamai	1	1	7.1	0	0	1	0.0	-1	0	0	0.0	0	1	1	14.3	0	2	1	2.5	1	0	1	0.0	-1
Zeeworth	1	1	5.0	0	1	1	1.5	0	0	0	0.0	0	0	1	0.0	-1	1	1	1.5	0	1	16	0.1	-15
<b>Margibi</b>	<b>11</b>	<b>12</b>	<b>0.9</b>	<b>-1</b>	<b>10</b>	<b>13</b>	<b>0.8</b>	<b>-3</b>	<b>0</b>	<b>5</b>	<b>0.0</b>	<b>-5</b>	<b>12</b>	<b>12</b>	<b>1.0</b>	<b>0</b>	<b>21</b>	<b>15</b>	<b>1.4</b>	<b>6</b>	<b>1</b>	<b>27</b>	<b>0.04</b>	<b>-26</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

There are 10 midwives in the 12 clinics (6 clinics have no midwife), whereas WISN calculation estimates that 13 midwives are required indicating that a shortage of 3 staff exist. The WISN ratio of 0.8 indicates that 80% of required midwife is available.

WISN calculation estimate that 5 lab personnel are required to provide basic laboratory services in public clinics in Margibi county. However, there is no lab personnel in this clinics indicating that a shortage of lab personnel exists. The WISN ratio of 0.0 show that 0% of required lab personnel is available.

WISN calculation estimates that 12 nurse aides are required and 12 staff are actually present in the public clinics indicating that the correct number of nurse aides is available. The WISN ratio of 1.0 indicates that 100% of the required nurse aides is available.

For nurses, there county public clinics have 21 nurses. WISN calculation show that only 15 nurses are required indicating a surplus of 6 nurses. The WISN ratio of 1.4 indicates that 140% of the required nurses is available.

There is just 1 PA serving in the 12 clinics, with no PA in 11 of the clinics. WISN calculation show that 27 PAs are required indicating that a shortage of 26 PAs exist. The WISN ratio of 0.04 indicates that less than 1% of the required PAs is available.

### 3.4.2.10 Maryland county

Table 32 for Maryland county shows that there are 16 dispensers serving the populace in 17 clinics, with no dispenser in 1 clinic. WISN calculation show that 17 dispensers are required indicating that a shortage of one dispenser exist. The WISN ratio of 0.9 indicates that 90% of the required dispensers is available.

There are 7 midwives providing service in the 17 clinics, with no midwife in 10 of the clinics. WISN calculation reveals that 79 midwives are required indicating that a shortage of 72 midwives exist. The WISN ratio of 0.09 indicates that less than 1% of the required workforce of this cadre is available.

WISN calculations estimate 8 lab personnel are required to provide services in public clinics in Maryland. However, there are 9 personnel indicating that a surplus of one lab staff exist. WISN ratio of 1.1 indicate that more lab personnel are available than required.

For nurse aides, there are 22 personnel in the public clinics in Maryland county. WISN calculation estimates that just 17 nurse aides are required indicating a surplus of 5 nurse aides. The WISN ratio of 1.3 indicates that 130% of the required nurse aides is available.

**Table 35: WISN RESULTS FOR DISPENSERS, MIDWIVES, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Maryland County]**

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Barraken Clinic	0	1	0.0	-1	0	2	0.0	-2	0	1	0.0	-1	1	1	9.1	0	3	2	1.7	1	0	1	0.0	-1
Boniken Clinic	1	1	2.4	0	1	1	0.8	0	0	1	0.0	-1	1	1	5.0	0	2	2	1.1	0	0	1	0.0	-1
Cavalla Clinic	1	1	5.6	0	1	28	0.0	-27	1	0	2.1	1	1	1	6.7	0	1	1	1.2	0	0	1	0.0	-1
Feloken Clinic	1	1	5.0	0	0	1	0.0	-1	1	0	2.4	1	2	1	11.1	1	1	1	1.1	0	0	1	0.0	-1
Fish Town Clinic	1	1	5.0	0	0	34	0.0	-34	1	1	2.0	0	1	1	8.3	0	1	1	1.6	0	1	18	0.1	-17
Gbarwiliken Clinic	1	1	5.0	0	0	1	0.0	-1	1	0	2.1	1	2	1	10.5	1	2	1	2.2	1	0	1	0.0	-1
Gboloken Clinic	1	1	5.9	0	0	1	0.0	-1	0	1	0.0	-1	2	1	13.3	1	1	1	1.3	0	0	1	0.0	-1

Glofaken Clinic	1	1	5.9	0	1	2	0.5	-1	1	0	2.3	1	2	1	9.1	1	1	1	1.3	0	0	1	0.0	-1
Judoku Clinic	1	1	4.6	0	0	1	0.0	-1	1	0	2.4	1	2	1	13.3	1	2	1	1.9	1	0	1	0.0	-1
Manolu Clinic	1	1	4.4	0	1	1	1.1	0	0	0	0.0	0	1	1	6.3	0	1	1	0.9	0	0	1	0.0	-1
Newaken Clinic	1	1	8.3	0	1	1	1.3	0	0	0	0.0	0	0	1	0.0	-1	2	1	2.9	1	0	1	0.0	-1
Pougboke Clinic	1	1	6.3	0	0	1	0.0	-1	0	1	0.0	-1	1	1	12.5	0	2	1	2.5	1	0	1	0.0	-1
Pullah Clinic	1	1	6.3	0	1	1	1.5	0	1	0	2.2	1	2	1	20.0	1	1	1	1.3	0	0	1	0.0	-1
Rock Town Clinic	1	1	4.6	0	0	1	0.0	-1	1	0	2.1	1	1	1	10.0	0	2	1	1.9	1	0	1	0.0	-1
Rock Town Kunokudi Clinic	1	1	4.8	0	0	1	0.0	-1	0	0	0.0	0	1	1	7.7	0	1	1	1.0	0	0	1	0.0	-1
Sodoken Clinic	1	1	4.8	0	0	1	0.0	-1	1	0	2.1	1	0	1	0.0	-1	1	1	0.9	0	0	1	0.0	-1
Yekiaken Clinic	1	1	5.9	0	1	1	1.3	0	0	0	0.0	0	2	1	12.5	1	1	1	1.3	0	0	1	0.0	-1
<b>Maryland</b>	<b>16</b>	<b>17</b>	<b>0.9</b>	<b>-1</b>	<b>7</b>	<b>79</b>	<b>0.09</b>	<b>-72</b>	<b>9</b>	<b>8</b>	<b>1.1</b>	<b>1</b>	<b>22</b>	<b>17</b>	<b>1.3</b>	<b>5</b>	<b>25</b>	<b>19</b>	<b>1.3</b>	<b>6</b>	<b>1</b>	<b>34</b>	<b>0.03</b>	<b>-33</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

The county public clinics have 25 nurses and the WISN calculation show that just 19 staff is required indicating that a surplus of 6 nurses exist. The WISN ratio of 1.3 indicates that 130% of the required nurses is available.

There is just one PA serving in one clinic. WISN calculation show that 34 PAs are required to provide care in the 17 public clinics, indicating that a shortage of 33 PAs exist. The WISN ratio of 0.03 indicates that less than 1% of the required PAs is available.

### 3.4.2.11 Montserrado county

Table 33 for Montserrado county shows that there are 20 dispensers serving the population attending 31 public clinics in the county, with 13 clinics having no dispenser. WISN calculation estimates that 30 dispensers are required indicating that a shortage of 10 dispensers exist. The WISN ratio of 0.7 indicates that 70% of the required dispensers is available.

For midwives, 51 staff exist in the 31 public clinics (7 clinics have no midwife). WISN calculation show that only 36 midwives are required indicating that a surplus of 15 personnel exist. The WISN ratio of 1.4 indicate that 140% of the required midwives is available.

Table 36: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Montserrado County]

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
AF Russell Clinic	1	1	4.2	0	0	1	0.0	-1	0	0	0.0	0	3	1	14.3	2	2	1	1.8	1	0	1	0.0	-1

Arthington Clinic	1	1	4.8	0	1	1	1.9	0	0	1	0.0	-1	2	1	12.5	1	2	1	2.7	1	1	13	0.1	-12
Banjor Clinic	2	1	3.8	1	2	1	1.6	1	0	1	0.0	-1	5	1	6.6	4	3	1	1.7	2	1	22	0.1	-21
Blamacee Clinic	1	1	1.7	0	3	1	2.8	2	0	1	0.0	-1	2	1	10.0	1	5	3	2.1	2	1	17	0.1	-16
Bushrod Community Clinic	1	1	3.1	0	1	1	1.5	0	0	0	0.0	0	1	1	5.0	0	1	1	1.1	0	1	28	0.0	-27
Camp Sande Ware Clinic	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	0	1	0.0	-1
Careysburg Clinic	2	1	4.4	1	3	1	3.8	2	0	1	0.0	-1	2	1	13.3	1	7	1	4.2	6	0	1	0.0	-1
Crozierville Clinic	1	1	5.6	0	2	1	5.7	1	0	1	0.0	-1	2	1	18.2	1	2	1	2.8	1	0	1	0.0	-1
Gardnersville Comm. Clinic	0	1	0.0	-1	2	1	1.3	1	0	0	0.0	0	3	1	4.8	2	3	5	0.7	-2	0	1	0.0	-1
Goba Town Clinic	1	1	3.2	0	1	1	1.3	0	1	1	1.2	0	2	1	8.3	1	3	1	2.1	2	0	1	0.0	-1
Group of 77 Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	0	0	0.0	0	2	1	2.1	1	0	1	0.0	-1
Harrisburg Clinic	0	1	0.0	-1	1	4	0.3	-3	0	1	0.0	-1	3	1	17.7	2	3	1	3.0	2	0	1	0.0	-1
Johnsonville Clinic	0	1	0.0	-1	4	1	2.1	3	0	1	0.0	-1	4	1	19.1	3	7	1	4.6	6	2	16	0.1	-14
Kingsville Clinic	1	1	3.7	0	4	1	3.3	3	0	1	0.0	-1	2	1	12.5	1	5	1	5.4	4	1	9	0.1	-8
Koon Town Clinic	1	1	5.9	0	1	1	1.5	0	0	0	0.0	0	1	1	12.5	0	4	1	4.6	3	0	1	0.0	-1
Kpalla Clinic	1	1	2.3	0	2	1	1.7	1	0	1	0.0	-1	5	1	14.7	4	4	1	2.4	3	1	16	0.1	-15
Liberia Coast Guard Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1
Louisiana Clinic	0	1	0.0	-1	1	1	1.1	0	1	1	1.4	0	1	1	2.9	0	5	3	2.0	2	0	1	0.0	-1
Mon. Central Prison Clinic	0	1	0.0	-1	1	1	4.0	0	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	0	1	0.0	-1
Mt. Barclay Clinic	0	0	0.0	0	1	1	4.4	0	0	1	0.0	-1	0	0	0.0	0	1	1	6.3	0	1	1	4.4	0
Omega Market Clinic	0	1	0.0	-1	9	1	6.7	8	0	0	0.0	0	2	1	20.0	1	8	1	5.5	7	1	7	0.2	-6
Pleemu Clinic	1	1	3.2	0	0	1	0.0	-1	0	1	0.0	-1	2	1	7.1	1	1	1	1.2	0	1	27	0.0	-26
Police Training Clinic	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	0	1	0.0	-1	0	1	0.0	-1
PUCC Clinci	0	1	0.0	-1	2	1	1.7	1	0	0	0.0	0	6	1	12.8	5	2	1	1.2	1	1	32	0.0	-31
RCD Marshall Clinic	0	1	0.0	-1	2	1	2.4	1	0	1	0.0	-1	1	1	5.3	0	4	2	1.9	2	1	19	0.1	-18
RH Ferguson	1	1	1.4	0	3	3	1.0	0	0	0	0.0	0	4	1	6.6	3	3	3	1.3	0	1	29	0.0	-28
Teenagar Comm. Clinic	1	1	4.2	0	1	1	1.3	0	0	1	0.0	-1	2	1	10.0	1	3	1	2.5	2	0	19	0.0	-19
White Plain Clinic	1	1	1.4	0	2	1	1.2	1	0	0	0.0	0	4	1	6.3	3	1	3	0.4	-2	0	1	0.0	-1
Yeabah Town Clinic	1	1	5.9	0	1	1	0.8	0	0	0	0.0	0	1	1	16.7	0	5	1	5.4	4	0	1	0.0	-1
Zannah Town Clinic	1	1	3.5	0	1	1	1.8	0	0	1	0.0	-1	1	1	2.9	0	0	1	0.0	-1	0	1	0.0	-1
Zingbor Town Clinic	1	1	4.4	0	0	1	0.0	-1	0	1	0.0	-1	1	1	9.1	0	2	1	1.7	1	0	1	0.0	-1
<b>Montserrado</b>	<b>20</b>	<b>30</b>	<b>0.7</b>	<b>-10</b>	<b>51</b>	<b>36</b>	<b>1.4</b>	<b>15</b>	<b>2</b>	<b>18</b>	<b>0.1</b>	<b>-16</b>	<b>62</b>	<b>26</b>	<b>2.4</b>	<b>36</b>	<b>88</b>	<b>44</b>	<b>2.0</b>	<b>44</b>	<b>14</b>	<b>272</b>	<b>0.05</b>	<b>-258</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference



There are 2 lab personnel serving the populace in the 31 public clinics in Montserrado. WISN calculations estimate that 18 lab technicians and assistants are required indicating that a shortage of 16 lab personnel exist. The WISN ratio of 0.1 shows that only 10% of required lab personnel are available.

For nurse aides, the county has 62 staff serving in the 31 clinics. However, WISN calculation show that just 26 nurse aides are required indicating a surplus of 36 personnel of this cadre. The WISN ratio of 2.4 indicates that 240% of the required nurse aides is available.

There are 88 nurses serving the populace in the 31 clinics, meanwhile the WISN calculation show that only 44 nurses are required indicating a surplus of 44 staff. The WISN ratio of 2.0 indicate that 200% of the required nurses is available.

Only 14 PAs exist in the 31 clinics in Montserrado (no PA in 18 clinics). WISN calculation estimates that 272 PAs are required indicating a shortage of 258 PAs. The WISN ratio of 0.05 indicates that less than 1% of the required PA is available.

#### **3.4.2.12 Nimba county**

Table 34 for Nimba county shows that there are 28 dispensers serving the population in 35 public clinics in Nimba county, with no dispensers in 7 of the clinics. WISN calculation show that only 3 dispensers are required, indicating a surplus of 25 dispensers. The WISN ratio of 9.3 indicates that 930% of the required dispensers is available.

There are 17 midwives serving in the public clinics in Nimba, meanwhile the WISN calculation estimates that 42 midwives are required indicating that a shortage of 25 staff exist. The WISN ratio of 0.4 indicate that only 40% of the required midwives is available.

WISN calculations estimates that 22 lab personnel are required to provide lab services in 35 public clinics. However, only 11 lab personnel are available indicating that a shortage of 11 personnel of this cadre exist. The WISN ratio of 0.5 show that only 50% of the required lab personnel is available.

Table 37: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Nimba County]

CLINICS	Dispenser				Lab				Midwives				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Beadatuo Clinic	1	0	4.2	1	0	0	0.0	0	1	1	1.0	0	1	0	8.3	1	3	1	2.4	2	0	0	0.0	0
Beindin	1	0	6.3	1	1	1	1.8	0	0	1	0.0	-1	1	0	12.5	1	2	1	2.3	1	0	0	0.0	0
Beoyoolar Clinic	1	1	1.7	0	0	1	0.0	-1	0	2	0.0	-2	1	0	2.6	1	1	3	0.4	-2	0	0	0.0	0
Boyee Clinic	1	0	4.8	1	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	1	1	0.9	0	0	0	0.0	0
Bunadin Clinic	1	0	3.3	1	0	1	0.0	-1	0	1	0.0	-1	1	0	5.0	1	1	1	0.8	0	0	0	0.0	0
Buutuo Clinic	1	0	2.1	1	0	1	0.0	-1	1	1	0.8	0	0	0	0.0	0	1	2	0.5	-1	0	0	0.0	0
Duayee Clinic	1	0	3.5	1	1	1	1.9	0	0	1	0.0	-1	5	0	20.0	5	2	1	1.7	1	0	0	0.0	0
Duo Town	0	0	0.0	0	0	0	0.0	0	0	1	0.0	-1	0	0	0.0	0	1	1	0.9	0	0	0	0.0	0
Duo-Tiayee Clinic	1	1	1.5	0	0	1	0.0	-1	1	2	0.6	-1	1	0	2.1	1	1	3	0.3	-2	0	0	0.0	0
Flumpa Clinic	1	0	3.6	1	1	1	1.6	0	0	1	0.0	-1	1	0	6.7	1	2	1	1.5	1	0	0	0.0	0
Ganta Community Clinic	1	1	1.7	0	0	1	0.0	-1	2	1	1.4	1	1	0	4.2	1	3	3	1.1	0	0	0	0.0	0
Gaogortuo Clinic	1	0	3.0	1	0	1	0.0	-1	0	1	0.0	-1	1	0	5.0	1	1	1	0.7	0	0	0	0.0	0
Gbalarlay Clinic	1	0	2.3	1	1	1	1.7	0	1	1	0.8	0	4	0	10.0	4	1	2	0.5	-1	0	0	0.0	0
Gbeivonwea Clinic	1	0	2.9	1	0	1	0.0	-1	1	1	1.2	0	0	0	0.0	0	1	2	0.6	-1	0	0	0.0	0
Gbloulay	0	0	0.0	0	1	1	2.0	1	0	1	0.0	-1	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0
Glan's Town Clinic	1	0	5.3	1	0	1	0.0	-1	0	1	0.0	-1	4	0	15.4	4	1	1	1.2	0	0	0	0.0	0
Graie Clinic	1	0	3.0	1	0	1	0.0	-1	1	1	0.9	0	1	0	4.6	1	1	2	0.7	-1	0	0	0.0	0
Karnwee Clinic	1	0	2.6	1	0	1	0.0	-1	0	1	0.0	-1	5	0	13.9	5	1	2	0.6	-1	0	0	0.0	0
Kpaytuo Clinic	1	0	3.6	1	0	1	0.0	-1	1	1	1.0	0	2	0	11.8	2	2	1	1.6	1	0	0	0.0	0
Kpein Clinic	1	0	2.9	1	2	1	3.3	1	1	2	0.7	-1	2	0	10.0	2	2	2	1.3	0	0	0	0.0	0
Kwendin Clinic	1	0	3.2	1	0	1	0.0	-1	0	1	0.0	-1	5	0	14.7	5	1	1	0.8	0	0	0	0.0	0
Lepula	0	0	0.0	0	1	1	1.5	0	0	1	0.0	-1	1	0	3.5	1	0	0	0.0	0	1	51	0.0	-50
Loguatuo	0	0	0.0	0	0	1	0.0	-1	2	2	1.3	0	1	0	3.9	1	1	2	0.6	-1	0	0	0.0	0
Lugbehyee	1	0	3.0	1	0	1	0.0	-1	0	1	0.0	-1	5	0	17.2	5	3	1	2.0	2	0	0	0.0	0
Mehnlā	1	0	3.0	1	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	1	2	0.6	-1	0	0	0.0	0
Payee	1	0	2.1	1	0	1	0.0	-1	0	2	0.0	-2	1	0	3.3	1	1	2	0.4	-1	0	0	0.0	0
Slangonplay	1	0	5.0	1	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	0	0	0.0	0	0	0	0.0	0
Toweh Town	1	0	2.8	1	0	1	0.0	-1	1	2	0.6	-1	0	0	0.0	0	1	2	0.5	-1	0	0	0.0	0

Tunukupyee	1	0	5.0	1	0	1	0.0	-1	1	1	1.4	0	1	0	4.2	1	0	0	0.0	0	0	0	0.0	0
Veyenglay	1	0	3.7	1	0	1	0.0	-1	1	1	0.7	0	1	0	4.8	1	1	1	0.8	0	0	0	0.0	0
Wehplay	1	0	4.2	1	0	0	0.0	0	1	2	0.7	-1	0	0	0.0	0	1	1	0.8	0	0	0	0.0	0
Youhnlay	0	0	0.0	0	0	1	0.0	-1	1	1	0.9	0	1	0	5.6	1	1	1	0.7	0	0	0	0.0	0
Zahn Bahnla	0	0	0.0	0	1	1	1.8	0	0	1	0.0	-1	2	0	10.0	2	1	1	0.9	0	0	0	0.0	0
Zuaplay Clinic	0	0	0.0	0	1	1	2.0	1	0	1	0.0	-1	2	0	9.1	2	3	1	2.6	2	0	0	0.0	0
Zuolay Clinic	1	0	4.6	1	1	0	3.1	1	0	1	0.0	-1	1	0	8.3	1	2	1	1.8	1	0	0	0.0	0
<b>Nimba</b>	<b>28</b>	<b>3</b>	<b>9.3</b>	<b>25</b>	<b>11</b>	<b>22</b>	<b>0.5</b>	<b>-11</b>	<b>17</b>	<b>42</b>	<b>0.4</b>	<b>-25</b>	<b>52</b>	<b>0</b>	<b>-</b>	<b>52</b>	<b>45</b>	<b>47</b>	<b>0.9</b>	<b>-2</b>	<b>1</b>	<b>51</b>	<b>0.02</b>	<b>-50</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

For nurse aides, the county clinics have 52 nurse aides providing services to the population. WISN calculation show that no nurse aide is required, indicating that a surplus of 52 staff exist.

WISN calculation show that 47 nurses are required in the 35 clinics in Nimba. However, 45 nurses exist (with 4 clinics having no nurse) indicating that a shortage of 2 nurses exist. The WISN ratio of 0.9 indicates that 90% of the required nurses is available.

Only 1 PA is serving in the public clinics in Nimba, whereas WISN calculation estimates that 51 PAs are required indicating that a shortage of 50 PAs exist. The WISN ratio of 0.02 reveals that less than 1% of the required PAs is available.

### 3.4.2.13 River Gee county

The table below for River Gee county shows that there are 14 dispensers providing care for the populace in 15 public clinics in this county. WISN calculation show that 15 dispensers are required, indicating that a shortage of 1 personnel exist. The WISN ratio of 0.9 indicates that 90% of the required dispensers is available.

There are 13 midwives serving in 15 clinics, with six clinics having no midwife. WISN calculation estimates that 15 midwives are required showing that a shortage of 2 midwives exist, and the WISN ratio of 0.9 indicating that 90% of the required midwives is available.

Seven lab personnel serve in the 15 public clinics. WISN calculations reveal that 8 personnel are actually required, indicating that a shortage of one staff exist. The WISN ratio of 0.9 show that 90% of required lab personnel are available.

The WISN estimates show that 14 nurse aides are required in the 15 clinics. However, there are actually 34 personnel indicating that a surplus of 20 nurse aides exist. The WISN ratio of 2.4 indicates that 240% of the required nurse aides is available.

For nurses, the county has 12 nurses serving in the public clinics with six clinics having no nurse. WISN calculation show that 17 nurses are required, indicating a shortage of 5 nurses. The WISN ratio of 0.7 indicates that 70% of the required nurses is available.

**Table 38: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [River Gee County]**

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Chekaken Clinic	1	1	5.9	0	0	1	0.0	-1	1	1	1.5	0	2	1	12.5	1	2	2	1.5	0	0	28	0.0	-28
Free Town Clinic	1	1	7.1	0	0	1	0.0	-1	0	0	0.0	0	1	1	10.0	0	1	1	1.3	0	0	1	0.0	-1
Gbeh Clinic	1	1	3.9	0	1	1	1.6	0	0	1	0.0	-1	4	1	23.5	3	0	1	0.0	-1	0	1	0.0	-1
Gmamoken Clinic	1	1	5.0	0	0	1	0.0	-1	1	1	1.7	0	2	1	12.5	1	1	1	1.6	0	1	28	0.0	-27
Jarkaken Clinic	1	1	4.4	0	2	1	2.4	1	0	0	0.0	0	0	0	0.0	0	1	2	0.8	-1	0	1	0.0	-1
Jayproken Clinic	1	1	1.4	0	2	1	6.1	1	1	1	1.4	0	4	1	5.3	3	0	1	0.0	-1	0	1	0.0	-1
Jimmyville Clinic	1	1	2.7	0	3	1	3.8	2	0	0	0.0	0	4	1	10.0	3	0	1	0.0	-1	0	1	0.0	-1
Juwelpo Clinic	1	1	10.0	0	0	1	0.0	-1	1	0	2.2	1	3	1	33.3	2	1	1	2.0	0	0	1	0.0	-1
Killepo Clinic	1	1	5.3	0	0	1	0.0	-1	0	1	0.0	-1	2	1	15.4	1	1	1	1.1	0	0	1	0.0	-1
Nyaaken Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	3	1	25.0	2	1	1	1.1	0	0	1	0.0	-1
Nyenebo Clinic	1	1	5.9	0	1	1	3.1	0	0	1	0.0	-1	1	1	16.7	0	3	1	4.1	2	1	7	0.2	-6
Pronoken Clinic	1	1	3.2	0	1	1	2.1	0	1	1	1.8	0	3	1	8.6	2	0	1	0.0	-1	0	1	0.0	-1
Putuken Clinic	1	1	4.2	0	1	1	1.7	0	1	1	1.7	0	0	1	0.0	-1	1	1	0.8	0	0	1	0.0	-1
Touboken Clinic	1	1	3.6	0	1	1	1.7	0	0	0	0.0	0	1	1	50.0	0	0	1	0.0	-1	0	1	0.0	-1
U_Bor Clinic	1	1	10.0	0	1	1	3.1	0	1	0	2.1	1	4	1	200.0	3	0	1	0.0	-1	0	1	0.0	-1
<b>River Gee</b>	<b>14</b>	<b>15</b>	<b>0.9</b>	<b>-1</b>	<b>13</b>	<b>15</b>	<b>0.9</b>	<b>-2</b>	<b>7</b>	<b>8</b>	<b>0.9</b>	<b>-1</b>	<b>34</b>	<b>14</b>	<b>2.4</b>	<b>20</b>	<b>12</b>	<b>17</b>	<b>0.7</b>	<b>-5</b>	<b>2</b>	<b>75</b>	<b>0.03</b>	<b>-73</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

The county has just 2 PAs providing services to the populace in 15 counties (no PA in 13 clinics). But the WISN calculation show that 75 PAs are required indicating a shortage of 73 PAs, and the WISN ratio of 0.03 revealing that less than 1% of the required PAs is available.

### 3.4.2.14 River Cess county

Table 36 below shows that 13 dispensers are providing services to the population in 12 public clinics in River Cess. However, WISN calculation reveal that just 12 dispensers are required, highlighting a surplus of 1 dispenser. The WISN ratio of 1.1 indicate that 110% of required dispensers is available.

For midwives, on 8 staff are present in the 12 facilities, whereas WISN estimates show that 12 midwives are required to provide care indicating that a shortage of 4 staff exist. The WISN ratio of 0.7 indicates that 70% of the required midwives is available.

One lab personnel serve the populace in the 12 public clinics. WISN estimates reveal that 6 lab personnel are required indicating that a shortage of 5 lab staff exist. The WISN ratio of 0.2 shows that only 20% of the required lab workforce is available.

There are 12 nurse aides in the county clinics and WISN calculation estimates that exactly 12 nurse aides are required. The WISN ratio of 1.0 also indicates that 100% of required nurse aides is available.

**Table 39: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [River Cess County]**

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
Bodowhea	1	1	3.1	0	1	1	1.5	0	1	1	1.9	0	1	1	2.7	0	0	1	0.0	-1	0	1	0.0	-1
Charlie's Town Clinic	2	1	6.7	1	1	1	1.4	0	0	1	0.0	-1	1	1	8.3	0	2	1	1.5	1	0	1	0.0	-1
Dorbor Clinic	1	1	5.6	0	1	1	2.1	0	0	1	0.0	-1	1	1	5.3	0	0	1	0.0	-1	1	28	0.0	-27
Gbediah Clinic	1	1	7.7	0	1	1	0.0	0	0	1	0.0	-1	1	1	12.5	0	2	1	1.5	1	0	1	0.0	-1
Fen River Clinic	1	1	4.6	0	0	1	1.5	-1	0	1	0.0	-1	1	1	9.1	0	1	1	1.8	0	0	1	0.0	-1
Gblorseo Clinic	1	1	7.1	0	1	1	1.6	0	0	0	0.0	0	1	1	9.1	0	1	1	1.4	0	0	1	0.0	-1
Gozohn Clinic	1	1	4.4	0	1	1	1.6	0	0	1	0.0	-1	1	1	6.7	0	1	1	1.0	0	0	1	0.0	-1
ITI Clinic	1	1	5.0	0	1	1	1.5	0	0	1	0.0	-1	1	1	4.2	0	0	1	0.0	-1	0	1	0.0	-1
Kangbo Clinic	1	1	4.8	0	0	1	0.0	-1	0	1	0.0	-1	1	1	8.3	0	3	1	2.9	2	0	1	0.0	-1
Kayah Clinic	1	1	6.3	0	0	1	0.0	-1	0	0	0.0	0	1	1	9.1	0	1	1	1.3	0	0	1	0.0	-1
Kploh Clinic	1	1	4.6	0	0	1	0.0	-1	0	0	0.0	0	1	1	10.0	0	2	1	1.9	1	0	1	0.0	-1
Larkpazee Cllinic	1	1	5.3	0	1	1	2.1	0	0	1	0.0	-1	1	1	11.1	0	2	1	2.2	1	0	1	0.0	-1
<b>Rivercess</b>	<b>13</b>	<b>12</b>	<b>1.1</b>	<b>1</b>	<b>8</b>	<b>12</b>	<b>0.7</b>	<b>-4</b>	<b>1</b>	<b>6</b>	<b>0.2</b>	<b>-5</b>	<b>12</b>	<b>12</b>	<b>1.0</b>	<b>0</b>	<b>15</b>	<b>12</b>	<b>1.3</b>	<b>3</b>	<b>1</b>	<b>39</b>	<b>0.03</b>	<b>-38</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

The county has 15 nurses providing care, whereas only 12 nurses are required according to the WISN calculation indicating that a surplus of 3 nurses exist. The WISN ratio of 1.3 indicates that 130% of the required nurses is available.

Only 1 PA is serving in the 12 public clinics, meanwhile the WISN calculation show that 39 PAs are required revealing a shortage of 38 PAs. The WISN ratio of 0.0 indicates that less than 1% of the required PAs is available.

### 3.4.2.15 Sinoe county

Table 38 shows the WISN indicators for 34 public clinics in Sino county. There are 27 dispensers serving the populace in these clinics, whereas the WISN calculation show that 32 dispensers are required indicating that a shortage of 5 personnel exist. A WISN ratio of 0.8 indicates that 80% of the required dispensers is available.

For midwives, 15 are available while 34 are required according to the WISN calculations, indicating that a shortage of 19 midwives exist. The WISN ratio of 0.4 shows that only 40% of the required midwives is available.

**Table 40: WISN RESULTS FOR DISPENSERS, MIDWIVES, LAB PERSONNEL, NURSES AIDES, NURSES AND PHYSICIAN ASSISTANTS IN [Sinoe County]**

CLINICS	Dispenser				Midwives				Lab				Nurse Aide				Nurse				Physician Assistant			
	ES*	C R	WR	W D	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD	ES*	CR	WR	WD
BOP Clinic	1	1	1.8	0	1	1	1.9	0	0	0	0.0	0	1	1	3.0	0	1	2	0.4	-1	0	1	0.0	-1
Butaw Clinic	1	1	6.3	0	1	1	1.6	0	1	0	2.2	1	0	1	0.0	-1	1	1	1.1	0	0	1	0.0	-1
Chebios Clinic	1	1	6.3	0	1	1	1.3	0	1	0	2.1	1	0	1	0.0	-1	1	1	1.5	0	0	1	0.0	-1
Diyankpo Clinic	1	1	8.3	0	0	1	0.0	-1	0	0	0.0	0	1	1	33.3	0	2	1	3.1	1	0	1	0.0	-1
Doodwicken Clinic	1	1	5.9	0	0	1	0.0	-1	0	0	0.0	0	1	1	10.0	0	1	1	1.3	0	0	1	0.0	-1
Drapoh Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	2	1	15.4	1	0	1	0.0	-1	0	1	0.0	-1
Ducorfree Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	1	1	6.7	0	0	1	0.0	-1	0	1	0.0	-1
Edward Memorial Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	1	1	10.0	0	0	1	0.0	-1	0	1	0.0	-1
Eni Clinic	1	1	5.6	0	0	1	0.0	-1	1	0	2.6	1	1	1	5.0	0	0	1	0.0	-1	0	1	0.0	-1
Gbason Town Clinic	0	1	0.0	-1	1	1	2.1	0	0	0	0.0	0	0	1	0.0	-1	0	1	0.0	-1	0	1	0.0	-1
Government Camp Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	2	1	11.1	1	1	1	1.0	0	0	1	0.0	-1
Grisby Farm Clinic	1	1	11.1	0	0	1	0.0	-1	0	0	0.0	0	1	1	50.0	0	2	1	3.9	1	0	1	0.0	-1
Jacksonville Clinic	1	1	6.3	0	0	1	0.0	-1	1	0	2.1	1	2	1	20.0	1	2	1	2.6	1	0	1	0.0	-1
Jokoken Clinic	1	1	12.5	0	1	1	2.3	0	1	0	2.4	1	1	1	1.0	0	2	1	4.6	1	0	1	0.0	-1
Juahzon Clinic	1	1	4.4	0	1	1	1.3	0	2	0	4.4	2	1	1	5.9	0	1	1	1.0	0	0	1	0.0	-1
Juayen Clinic	1	1	8.3	0	1	1	1.8	0	0	0	0.0	0	1	1	12.5	0	1	1	1.6	0	0	1	0.0	-1
Kabada Clinic	1	1	10.0	0	0	1	0.0	-1	1	0	2.3	1	2	1	25.0	1	1	1	1.8	0	0	1	0.0	-1
Karwuekpo Clinic	1	1	5.0	0	1	1	1.6	0	1	0	2.3	1	1	1	25.0	0	0	1	0.0	-1	0	1	0.0	-1
Kilo Town Clinic	1	1	5.6	0	1	1	1.0	0	0	0	0.0	0	1	1	11.1	0	2	1	2.3	1	0	1	0.0	-1
Kwitatuzon Clinic	1	1	7.1	0	1	1	2.9	0	1	0	2.3	1	1	1	6.3	0	0	1	0.0	-1	1	24	0.0	-23
Lexington Clinic	1	0	0.0	1	0	1	0.0	-1	0	0	0.0	0	1	1	50.0	0	0	1	0.0	-1	0	1	0.0	-1
Menweh Walker Clinic	2	1	12.5	1	1	1	1.3	0	0	0	0.0	0	2	1	13.3	1	1	1	1.4	0	0	1	0.0	-1
Nyennawlicken Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	2	1	15.4	1	1	1	1.3	0	0	1	0.0	-1
Panama Clinic	1	1	5.9	0	0	1	0.0	-1	0	0	0.0	0	2	1	16.7	1	1	1	1.3	0	0	1	0.0	-1
Payne Town Clinic	0	1	0.0	-1	0	1	0.0	-1	1	1	2.0	1	1	1	4.8	0	0	1	0.0	-1	1	30	0.0	-29

Pelloken Clinic	0	1	0.0	-1	0	1	0.0	-1	0	0	0.0	0	1	1	8.3	0	0	1	0.0	-1	0	1	0.0	-1
Roselyn T. Massaquoi Clinic	1	1	2.4	0	0	1	0.0	-1	0	1	0.0	-1	1	1	5.6	0	2	1	1.1	1	0	1	0.0	-1
Saywon Town Clinic	1	1	9.1	0	0	1	0.0	-1	0	0	0.0	0	1	1	14.3	0	1	1	1.7	0	0	1	0.0	-1
Sinoe Rubber Company	1	0	0.0	1	2	1	4.6	1	2	0	5.6	2	2	1	2.0	1	2	1	1.7	1	0	1	0.0	-1
Togbaville Clinic	1	1	4.8	0	1	1	1.1	0	1	1	1.5	0	1	1	3.9	0	0	1	0.0	-1	0	1	0.0	-1
Tubmanville Clinic	1	1	5.3	0	0	1	0.0	-1	1	1	1.9	0	1	1	4.8	0	0	1	0.0	-1	0	1	0.0	-1
Tuzon Clinic	1	1	9.1	0	0	1	0.0	-1	1	0	2.4	1	2	1	15.4	1	0	1	0.0	-1	0	1	0.0	-1
Voogbadee Clinic	1	1	8.3	0	1	1	2.0	0	1	0	2.2	1	1	1	11.1	0	1	1	1.6	0	0	1	0.0	-1
Wiah Town Clinic	1	1	4.6	0	0	1	0.0	-1	1	0	2.2	1	1	1	6.3	0	1	1	1.0	0	0	1	0.0	-1
<b>Sinoe</b>	<b>27</b>	<b>32</b>	<b>0.8</b>	<b>-5</b>	<b>15</b>	<b>34</b>	<b>0.4</b>	<b>-19</b>	<b>18</b>	<b>12</b>	<b>1.5</b>	<b>6</b>	<b>40</b>	<b>34</b>	<b>1.2</b>	<b>6</b>	<b>28</b>	<b>35</b>	<b>0.8</b>	<b>-7</b>	<b>2</b>	<b>86</b>	<b>0.02</b>	<b>-84</b>

ES: Existing staff, CR: Calculated requirement, WR: WISN ratio, WD: WISN difference

There are 18 lab personnel (technicians and assistants) serving in the public health clinics. WISN calculations estimate that 12 personnel are required indicating that a surplus of 6 staff exist. The WISN ratio of 1.5 show that the county has more lab workers than required.

Forty (40) nurse aides are providing care in the 34 clinics, and WISN calculation estimates that 34 staff of this cared are required indicating that a surplus of 6 nurse aides exist. The WISN ratio of 1.2 indicates that 120% of the required nurse aides is available.

WISN calculations estimates that 35 nurses are required, meanwhile only 28 personnel are actually providing care to the population indicating that a shortage of 7 7 staff exist. The WISN ratio of 0.8 shows that just 80% of the required nurses is available.

Only 2 PAs are proving services in the 34 public facilities, whereas 86 PAs are required according to the WISN estimates (shortage of 84 staff of this cadre). The WISN ratio of 0.02 indicates that less than 1% of the required PA is available.

## 4.0 LIMITATIONS

1. Depends on availability of annual statistics on services
2. Detail of analysis is determined by detail in statistic
3. Calculation is retrospective
4. Ignores other influences on workload, e.g. unavailability of medicines

## 5.0 CALL TO ACTION

1. Periodic conduct of WISN should be instituted into the Ministry's health workforce planning and management policies, strategies and processes. The results from the WISN exercise should be used for allocation, and re-distribution of health workers at clinic and health centers throughout the country.
2. As part of the implementation of the WISN results, a road map should be developed to provide a clear direction in order to achieve optimal service delivery, realistic distribution and placement of health workers, promote equity in access to health and improvement in access to health workers in the country.
3. Workloads and other context-specific characteristics should be considered by health workforce planners and managers in order to ensure an appropriate skill mix of health workers are available at health facilities. Also, the reallocation of tasks should be made at service delivery points based on scope of practice and competencies to reduce workload pressure faced by some health workers.
4. The WISN results can also be used to bridge the huge staffing disparities between clinics and health centers in the urban areas and those in the rural areas. It could also be used to inform the recruitment of additional health workers in short supply; specifically, nurses, midwives, and frontline cadres needed at clinics and health centers immediately and in the long term.



# APPENDIX

## Appendix A: LIBERIA Steering Committee Members

S/N	Name	Designation
1	Dr. Wilhemina Jallah	Minister
2	Dr. Francis Kateh	CMO
3	James M. Beyah	Director, HRH
4	Norwu G. Howard	Deputy Minister, Administration
5	Vaifee Tulay	Deputy Minister, Policy and Planning
6		
7		

### Duties and Responsibilities

The Steering Committee shall have the following duties and responsibilities:

1. Review, approve and monitor the Implementation strategy and implementation plan.
- 2) Mobilize support towards the successful implementation of the Implementation Strategy and Plan, and use of its findings and recommendations.
- 3) Facilitate periodic review of the Implementation Strategy and Plan to ensure progress and standards.
- 4) Lead on all advocacy and decision-making initiatives.
- 5) Facilitate dialogue and consensus interactions amongst all major health sector stakeholders
- 6) Initiate and conduct advocacy to relevant decision makers at all levels for the implementation of the recommendations

## Appendix B: Liberia technical task force members

S/N	Name	Designation
1	James M. Beyan	HRH/MOH
2	Moibah E. N. Sherif	HRH/MOH
3	Tomik L. J. Vobah	Office of General Counsel/MOH
4	Diana Sarteh	MOH
5	Cecelia Flomo	LBNM
6	Martin Dumoe	MOH
7	Julius N. Matthews	MOH
8	Patrick Konwloh	MOH
9	Dr. Mabande	LMDC
10	Lorraine Cooper	CHSD
11	Dr. Gorbee Logan	MOH
12	Memunah Donah	Pharmacist Board
13	Dr. Charles Ocan	WHO
14	Matthew Flomo	WORLDBANK
15	Dr. Marion Zubah	LAST MILE HEALTH
16	Alice G. Pency-Quiah	HRH/MOH
17	Beauty Kangbeh	HRH/MOH
18	Ambrose Wreh	HRH/MOH
19	Rodney T. Cummings	HRH/MOH
20		

## Duties and Responsibilities

The Technical Task Force (TTF) shall have the following duties and responsibilities:

1. Develop and finalize the Implementation strategy and plan.
2. Coordinate and lead the implementation of the strategy and plan
3. Support the Expert Working group in determining workload components and activity standards for selected cadre(s).
4. Conduct field data collection, verification and analysis.
5. Determine the staffing requirements and norms based on the WISN findings.
6. Develop staffing norms and WISN reports and recommendations and present them to the Steering Committee and other decision makers.

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## Appendix C: expert working group members for health centers and clinics

S/N	Name	Cadre	Health Facility	County
<b>Health Centers</b>				
1	Kollie Gboyo	Lab Tech	Unification HC	Margibi
2	Augustine S.N. Teewah	Lab Tech	Karnpay HC	Nimba
3	Mambudu A. Nomah	Lab tech	St. Timothy Hosp	Cape Mount
4	Henry T. Momo	Lab Tech	St Francis Hosp	River Cess
5	George C. Tarlue	Lab Tech	Konobo HC	GrandGedeh
6	Farrington F. Gbolorwolo	Pharmacist	Saclepea HC	Nimba
7	Clement Sackie Johnson	Pharmacist	Kakata HC	Margibi
8	Abdulai Sogbeh	Pharmacist	Sinje HC	Cape Mount
9	Sage Cyrus Kehdon Sr	Nurse Anaesth	Saclepea HC	Nimba
10	Betty Saylee	Nurse Anaesth	Sinje HC	Cape Mount
11	Bindu J. Guah	Pharmacist	Bomi county HC	Bomi
12	Dr Daniel Kofa	MD	Sinje HC	Cape Mount

13	Vivian S. Manobah	Nurse Aide	Sinje HC	Cape Mount
14	Rita N. Kahn	Nurse Aide	Gbarzon HC	Grand Gedeh
15	Krubo Kezelee	Nurse Aide	Cotton Tree HC	Margibi
16	Moses M. Dahn	Nurse Aide	Bahn HC	Nimba
17	Promise S. Siaffa	R. Nurse	St Francis Hosp	River Cess
18	Tainah Zubawuu	R. Nurse	Massaquoi HC	Margibi
19	James K. Yorgbor	R. Nurse	Bahn HC	Nimba
20	Nuwoh S. Mulbah	R. Nurse	Kakata HC	Margibi
21	Dorothy M. Padmore	PA	Marshall HC	Margibi
22	Isaac W. Diakpo	PA	G.W.H Hosp	Nimba
23	Sylvester G. Gaye	PA	Konobo HC	Grand Gedeh
24	Varney F. Paasewe	PA	Bo-Water Side HC	Cape Mount
25	Namah Massaleu	Dispenser	Sinje HC	Cape Mount
26	Magdaline T. Toe	Dispenser	Dolo Town HC	Margibi

27	Johnnet T. Gray	RM	Damballa HC	Cape Mount
28	Amelia Tickey	RM	Gbarzon HC	Grand Gedeh
29	Sara F. Bornquoi	Lab Asst	Bolahun HC	Lofa
30	Vallah J. Lavela	Lab Tech	Bong Mine Hosp	Bong
<b>Clinics</b>				
31	Eric Cere	Lab Asst	Charlie Town Clinic	River Cess
32	John K. Kollie	Lab Asst	Tuckerta clinic	Margibi
33	Amah J. Sinyon	Lab Asst	Jenneh #3 Clinic	Bomi
34	Anthony Peal	Lab Asst	Butaw Clinic	Sinoe
35	Aaron J. Sehe	Lab Asst	Varguaye clinic	Cape Mount
36	Suah Vankpanah	RM	Zorgowee Clinic	Nimba
37	Davidson Morgan	RM	Suehn Mecca clinic	Bomi
38	Watchen P. Johnson	RM	OBS Clinic	River Cess
39	Faith T. Nah	RN	Kinjor Clinic	Cape Mount

40	James N. Clarke	RN	Kayah Clinic	River Cess
41	Theresa Z. Karnwea	RN	RTMC	Sinoe
42	Matthew K. Bolu	RN	BOPC	Sinoe
43	Harrison L.L Garwon	RN	Zuaplay clinic	Nimba
44	Matisse S. Zarzar	RN	Janson	Grand Gedeh
45	Hamilton S. Sartee Jr	Nurse Aide	Kwitatucou clinic	Sinoe
46	Alex G. Holmes	Nurse Aide	Sackie town clinic	Bomi
47	Philip G. Bahn	Nurse Aide	Neezuin clinic	River Cess
48	Catherine M. Sangar	PA	ITI Clinic	River Cess
49	Kolubah Zawu	PA	Karquekpo clinic	Sinoe
50	Tarwell M. Cole Sr	Dispenser	Beafinie clinic	Bomi
51	Rosetta S. Worlah	Dispenser	Gbason Town clinic	Sinoe
52	Isaiah S. Beah	Dispenser	Kabada clinic	Sinoe
53	Mark Banwon	Dispenser	Gblorse clinic	River Cess

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54	Jannet K. Jones	Dispenser	Zaw town clinic	Grand Gedeh
55	Sehe Z. Brown	Dispenser	Goghen clinic	Bomi
56	Comfort G. Kandolo	Nurse Aide	Phebe	Bong
57	James G. Scott	Nurse Aide	Bamboon Town clinic	Gbarpolu
58	Alex B. Flangiah	Nurse Aide	Barcoline clinic	Grand Bassa
59	Hannah D. Allen	Dispenser	Phebe	Bong
60	Pastina A. Suah	Dispenser	Gokala clinic	Gbarpolu
61	Henry Siafa	Lab Asst	Gbarnyamah clinic	Gbarpolu
62	Betty Brima	Lab Asst	Gbarma clinic	Gbarpolu
63	Cellian Fahncole	RN	Well Baby clinic	Grand Bassa
64	Salome G. Walters	RN	Tarkpoima	Gbarpolu
65	Thomas T. Sawyer	Lab Asst	Salala clinic	Bong
66	James Menekemu	Lab Asst	Belefani clinic	Bong
67	Mackie Flomo	Lab Asst	Well Baby clinic	Grand Bassa

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68	Zarnah M. Davis	RM	Bokay town clinic	Grand Bassa
69	Lucia N. Bokay	RM	Fassama clinic	Gbarpolu

### Duties and Responsibilities

The EWG shall have the following duties and responsibilities:

1. Define and validate the main workload components (health service, support and additional) of selected cadre(s).
2. Establish the sub-components for each workload component of the cadre(s) based on standard operating procedures.
3. Define the activity standard(s) for each of the sub-components of the workload component(s).
4. Obtain consensus within the group for selected cadre(s) and facilities.
5. Submit validated workload components and activity standard