

# Republic of Liberia

Emergency Obstetric and Newborn Care (EmONC)

Rapid Needs Assessment 2021



July 30, 2022



## FOREWORD

The Government of Liberia through the Ministry of Health with support from key partners are committed to ensuring the provision of quality sexual and reproductive, maternal newborn child and adolescent health services (RMNCAH) to its population. However, available evidence reveals that, while some progress has been made as evidenced by the 2019/2020 Liberia Demographic Health Survey (LDHS), more needs to be done to greatly improve the health of mothers, adolescents and newborns. The country's maternal mortality ratio although decreased from 1072/100,000 live births over the past five years however remains one of the highest in the world at 742/100,000 deaths per live births. This high MMR is an indication of challenges in the provision of quality maternal newborn care services during pregnancy, childbirth and the postnatal period. At this current trend, Liberia's MMR will decrease to 272/100,000 live birth by 2030, thereby missing the set SDG of 70/100,000 during the same period. In an effort to reduce these high unpreventable deaths, system strengthening for maternal newborn care services must be improved across various levels of the health care delivery system.

The World Health Organization (WHO) has outlined key recommendations for countries to ensure that populations have access to health facilities providing EmONC services. Therefore, recognizing that the role of Comprehensive Emergency Obstetric and Newborn Care (CEmONC) and Basic Emergency Obstetric and Newborn Care (BEmONC) are critical to meeting these goals, and the fact that there is not current data on EmONC signal functions, the Ministry of Health in collaboration with United Nations Population Fund conducted a rapid EmONC needs assessment. It is also worth mentioning that the last EmONC Assessment was conducted in 2010. Although many other health surveys such as SARA have been completed, none have captured adequate data on the capacity of designated EmONC facilities to provide EmONC signal functions in line with global standards. This 2020 rapid assessment is important in setting the baseline for EmONC signal functions for all designated health facilities as prescribed by standards in formulating and implementing strategies for improvement.

This 2020 EmONC needs assessment is being conducted during an unprecedented period where the COVID-19 pandemic is having a toll the health care delivery system. Nevertheless, the significance of this assessment is critical to ensuring that women or child bearing age received quality health care services during pregnancy and maternal care. This cross-sectional population-based survey of health facilities in Liberia covering a total of 106 hospitals, health centers and clinics that provided delivery or other maternity services at the time of the survey. Findings contained in this document provide information on services from all levels of care in each county in the country. This assessment report comes at an opportune time, for two strategic reasons, there is fresh data from the LDHS 2019/2020 one hand and as the development of a new health policy and plan 2022-2026 on the other. We believe the findings, conclusions and recommendations outlined in this document related to the gaps in access to care in public health facilities across the country will be very important in prioritizing key services in the health sector with specific emphasis on maternal, newborn care services.

On behalf of the Ministry of Health, I convey my sincere gratitude to all partners especially UNFPA, UNICEF, LISGIS and other partners who contributed to the development of this document for their financial and technical support. I also commend the Family Health Division, the Health Management Information System, Monitoring & Evaluation and Research Divisions/Programs as well as all County Health Teams for working closely with our partners in the successful completion of the 2020 Rapid EmONC needs assessment and the production of this report.

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## ACKNOWLEDGEMENTS

The importance of data for decision making an action cannot be overemphasized. Since 2010, it has been difficult to determine the designated health facilities in Liberia delivering Basic or Comprehensive Emergency Obstetric and Newborn care services (BEmONC and CEmONC. Information on EmONC services has been scanty. With the completion of this 2020 rapid assessment of 106 designated public health facilities nationwide, there is now reliable information on EmONC services for the 15 counties in Liberia.

The process of this facility based survey considered many activities including the development of tools, training of enumerators, data collection, quality assurance processing and data analysis, interpretation, validation and final report. All of these key inputs were accomplished by various technical teams under the leadership of the ministry of health.

On behalf of the Ministry of health, significantly the Family Health Division/Program, the HMER (Research Unit), I am pleased to extend gratitude to our partners UNFPA and UNICEF for providing financial and technical resources for this rapid assessment. Many thanks to members of the core team in the MoH, including FHD, HMER and various County Health Teams and other NGO partners for their role of oversight and implementation of this 2020 rapid assessment. As the MoH is in the process of developing the next five-year Health Policy and plan 2022/2026, it is our hope that various county health teams will utilize results and recommendations in this study to effective plan interventions that support the delivery of EmONC signal functions in all designated facilities.

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## ABBREVIATIONS

AFT	Agenda for Transformation
ANC	Antenatal Care
AMDD	Averting Maternal Death and Disability
AMTSL	Active Management of third stage of labor
ARVs	Antiretroviral
AVD	Assisted Vaginal Deliver
BEmONC	Basic Emergency Obstetric Newborn Care
CEmONC	Comprehensive Emergency Obstetric Newborn Care
CS	Caesarean Section
D&C	Dilation and Curettage
D&E	Dilation and Evacuation
DHS	Demographic and Health Survey
EVD	Ebola Virus Disease
FHD	Family Health Division
F P	Family Planning
HMIS	Health Management Information System
GDP	Gross Domestic Product
GOL	Government of Liberia
GDP	Gross Domestic Produce
IM	Intramuscular
IV	Intravenous
LDHS	Liberia Demographic and Health Survey
LISGIS	Liberia Institute of Statistics and Geo-Information Services
LMICs	Low and Middle-Income Countries
MMR	Maternal Mortality Rate
MNH	Maternal and Newborn Health
MOH	Ministry of Health
MVA	Manual Vacuum Aspirator
NGO	Non- Governmental Organization
PAPD	Pro-Poor Agenda for Prosperity and Development
PMTCT	Prevention of Mother To Child Transmission
RMNCAH	Reproductive Maternal Neonatal Child and Adolescent Health
SDGs	Sustainable Development Goals

SPSS	Statistics Package for the Social Sciences
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
WHO	World Health Organization

## Executive Summary

Liberia's 2020 Emergency Obstetric and Newborn Care (EmONC) Assessment was the second such assessment since the first one conducted in 2010. The 2020 EmONC covered 18 hospitals and a sample of 28 Health Centers (HC) and 60 clinics that provided delivery or maternity services at the time of the survey.

The survey used abridged versions of the AMDD (Averting Maternal Death and Disabilities) Program's and have been adapted locally for ever needs assessment. The recent EmONC assessment tools (Modules 1 to 5): infrastructure, communication, transportation, human resources, and service statistics over a 12-month period (deliveries, newborn outcomes, direct and indirect obstetric complications, maternal and neonatal deaths, and referrals). The provision of EmONC signal functions and other maternal and newborn health services were also covered in this assessment.

Majority of the public hospitals (81.8 percent) and a 70 per cent sample of public HCs and 22% sample of public clinics were selected for this assessment. Accordingly, a total of 106 hospitals (18), HC (28) and clinics (60) all public facilities were visited, and all health facilities provided delivery services in the last 12 months (July 2019-June 2020) prior to the survey. Twenty-one health personnel with a minimum health background qualification of a diploma (with two years of college education) or higher degree in nursing or midwifery served as data collectors and supervisors. Data collection was conducted between March to June 2020. Due to the wide spread of COVID, the teams were called from the field and later returned in June to complete the field exercise.

The data analysis for this report followed two stages: preliminary analysis, and final analysis. Preliminary data analysis took into consideration defining key stratifying variables (such as county, facility type and ownership and EmONC status), merging databases, creating important new variables, and preparing key indicators. Contradictions and other issues were rectified during this preliminary phase. Final analysis was carried out after the data was sufficiently cleaned and certified for the core-team. The data collection was carried out using programmed tablets. The tablets were used to collect and transmit data automatically while in the field. Upon completion, the data files were exported into CSV, SPSS and/or STATA files for analysis.

The ratio of maternity beds (obstetrics/gynecology + labour and delivery) to 1,000 deliveries met the international standard of 30–32 beds. However, (Gbarpolu, Grand Cape Mount, Grand Gedeh, Grand Bassa, and Nimba) fell short of the minimum number of beds. Eighty- nine per cent (89%) of hospitals had operating theatres (OTs). Though HCs were not required to have OTs, 29 per cent of them reported that they had an OT basically to provide minor surgery. These were public health facilities that had the infrastructure set-up and required staffing to provide surgical services. Majority of the facilities had corners for newborn first aid/care; but only 33% of hospitals, 11% HCs, and 10% clinics had Neonatal Care Units.

According to the UN handbook for EmONC signal functions, a facility qualifies to provide Basic Emergency Obstetric and Newborn Care, if it performs all the seven basic signal functions. In addition to the seven core signal functions, it qualifies as Comprehensive if it performs all the Basic plus caesarean delivery and blood transfusion. Though the status of EmONC signal functions at facilities performing delivery may be known, these facilities have not yet been classified as EmONC facilities. Unlike other countries, Liberia have not yet concluded on identifying facilities that should be classified as EmONC facilities or not. Therefore, every facility that offer delivery are classified as EmONC facility. There is a work in progress on setting a criteria and identifying facilities that could be an EmONC Facility going forward.

The availability of EmONC facilities varied across counties and regions with five counties having majority of the EmONC facilities. Distribution by regions reveal that region 2 (Montserrado, Margibi and Grand Bassa) and 3 (Lofa, Bong and Nimba) have higher proportion of EmONC facilities with 37% and 27% respectively.

Performance of other maternal and newborn health services, based on self-reported data, 75 percent of all institutions offered 24-hour obstetric and neonatal care services. Obstetric surgery, general and spinal anesthesia services were provided in only 25, 24 and 26 per cent of hospitals, respectively. All facilities provided the Active Management of Third Stage of Labor (AMTSL) and used of partograph for labor monitoring.

This assessment shows gaps in the availability of some categories of health workers, except for general medical doctors (general practitioner), obstetrician/gynecologists, general surgeons, pediatrician, and neonatologist particularly among hospitals. There were shortages observed across nurses (43), midwives (29), physician assistant (10) and lab technician (10). Of the combined total (88 clinical staff short including Lab technicians), hospitals account for 68% compared to primary facilities. Availability of health worker cadres 24/7 was a challenge in most sites. The assessment shows staff were more likely to be on site during the day, Monday through Friday, than at night or during weekends and holidays.

Majority (98%) of the facilities reported having a pharmacy or supply of medicines. Among all facilities with a pharmacy or supply of medicines, 48% of them had their pharmacies accessible 24 hours a day and seven days a week (24/7). Ninety percent (90) of the facilities mentioned the government as the major source of medicines and supplies. However, availability of essential drugs in Liberia remains a major challenge in the health system. Figure 10 shows antibiotics to be the most out of stock essential drugs experienced within health facilities. Stockout of specific antibiotics range from metronidazole (26%), Ampicillin (37%), Gentamicin injection (37%), Penicillin (46%) and Procaine benzyl penicillin (52%). Among all essential drugs, Oxytocics and prostaglandins (99%), Anticonvulsants (93%), Antibiotics (Any) 94%, Antiretrovirals (ARVs) 81%, Antimalarials (94%), Analgesics (73%) and Contraceptives (94%) were the most common essential drug across health facility type.

The most common materials for infection prevention across facilities were Regular trash bin (95%), Puncture-proof sharps container (93%), Prepared disinfection solution (86%) and Non-sterile protective clothing (86%). As shown in Figure 13, over 90 percent of facilities have immediate newborn care, focused antenatal care, HIV PMTCT and family planning guidelines and protocols. Eighty-three percent had guidelines for management of obstetric and newborn complications. Partograph (92%), IV Infusion stand (93%), Scissors (94%), Measuring tape (95%), Beds (97%) and Examination table (98%) were the most common equipment and supplies in Maternity area. Of all the facilities, only 63 percent had laboratories and were more likely to be found in hospitals and health centers. Blood bank refrigerator was available in only 28% of the facilities and was mostly found in 88 percent of hospitals.

Referral system, nationally only 33 percent of the facilities had a functioning motor vehicle ambulance; while 7.5 percent of facilities had other motor vehicles for transportation, required for transporting referrals. River Gee and Sinoe Counties having at least one mode of transportation. The distance patients travel to obtain treatment has long been recognized as a primary determinant of the utilization of health care facilities. Knowing the distance and time to the next health facility including surgical facilities can aid with referrals and evidence-based planning for medical care and logistics, especially for mid- and lower-level facilities that frequently make referrals to higher-level facilities.

## CHAPTER 1: Introduction and Background

### 1.1 Country Profile

Liberia is situated on the west coast of Africa and borders, the Republic of Guinea on the North, Cote D'Ivoire on the East, Sierra Leone on the West and the Atlantic Ocean on the South. It covers an area of 111,369 square kilometres with an estimated population of 4.5 million people in 2021. It is a low-income country with an estimated Gross Domestic Product (GDP) per capita of USD 622 in 2019, a 8.8% declined from 2018<sup>1</sup>. The country is geographically divided into five regions and 15 counties, with populations ranging from 74,317 in Grand Kru County to 1,434,974 in Montserrado County<sup>2</sup>.



Capital city of Liberia: Monrovia

Official working language: English

Currency: Liberian Dollars

The 2019 United Nations Development Program (UNDP) Human Development Index ranked Liberia 176 out of 189 countries, which is among the lowest in the world. The report indicates that the average life expectancy is 64 years (65.1-females and 62.3-males)<sup>3</sup> and the adult literacy rate is 48.3 percent<sup>4</sup>. Progress is being made on some of the Sustainable Development Goals (SDGs)—for example, access to improved drinking water is 85 percent, and 48 percent of households have access to improved sanitation facility with services concentrated in urban (35 percent) than rural areas (9 percent)<sup>5</sup>.

Liberia has a total of 866 health facilities 37 hospitals, 61 health centers and 768 clinics. The country begun its rebuilding process in 2006 after fourteen years of civil conflict (1989-2003) which devastated the country's basic infrastructure. The Pro-Poor Agenda for Prosperity and Development 2018 to 2023 (PAPD) is the second in the series of 5-year National Development Plans (NDP) anticipated under the Liberia Vision 2030 framework. It follows the Agenda for Transformation 2012-2017 (AfT). The process of rebuilding has been aided by relative political stability, significant donor contributions, and strong annual economic growth averaging 6.4 percent per year from 2004 to 2008 (WB).

In addition to the 14-year civil crisis which had devastating impacts on the health and economic infrastructure of the country, Liberia was amongst three West Africa nations that experienced the Ebola Virus Disease (EVD) outbreak (2014-2016). Liberia confirmed its first case in March 2020 and continues to confirm cases up to present. These factors combined have significantly impacted the development of the health care delivery system overall and care for women and girl's reproductive health across the country.

<sup>1</sup> <https://www.macrotrends.net/countries/LBR/liberia/gdp-per-capita>>Liberia GDP Per Capita 2000-2020</a>. www.macrotrends.net. Retrieved 2020-11-30.

<sup>2</sup> Liberia National Population and Housing Census projected figure in 2020

<sup>3</sup> <http://hdr.undp.org/en/data>

<sup>4</sup> UNESCO Institute for Statistics (<http://uis.unesco.org/>)

<sup>5</sup> DHS 2019-20

## 1.2 Maternal and Newborn Health

Maternal and Childhood infectious diseases dominate the morbidity and mortality figures, and fertility is at 4.2 (LDHS 2019/2020). The current demographic trend in Liberia shows that a large proportion of its population is within the adolescent and youth age range (World Bank 2011). This provides Liberia with an opportunity for a demographic dividend if evidence-based investments are made. However, this opportunity is threatened by the high rate of teenage pregnancies of 30% of women between 15–19 years having begun childbearing. The overall contraceptive prevalence rate is low at 24% and an unmet need for contraception of 30%. The situation become even more grim when an average of 3 to 6 women and nearly double the number of newborns die from preventable deaths.

The 2019/2020 LDHS report estimates the Maternal Death Ratio was 742/100,000 live births annually from preventable conditions while infant mortality has been estimated at 63/1000 live births. For the first time in nearly two decades the MMR has seen a considerable decline by almost a third, despite this decline the neonatal deaths over the past five years have continued to increase (evidenced by the recent LDHS 2019/2020) 54/1000 live births to 63/1000. This is a 17% increase over the past five years and this information supports the high neonatal mortality facing the health sector.

The death of a mother and newborn is a tragedy that has an immense impact on the wellbeing of the woman, family and society at large. Most causes of Maternal and Neonatal deaths in Liberia are preventable. And Liberia's numbers can see a major decline when. Additionally, contributing factors such as system strengthening challenges that affect the provision of quality Reproductive Maternal Neonatal Child and Adolescent Health (RMNCAH) including the, lack of quality and timely delivery of life saving drugs, medical supplies, inadequate human resource, poor adherence to policies, standards and protocols, as well as a weak monitoring and mentoring system are adequately addressed.

## 1.3 EmONC Signal Functions and Indicators

The reduction of maternal and newborn mortality has increasingly become a major development agenda for many low resources middle income countries. The sustainable development goals has set a global target (Target 3.1) of 70/100,000 live births. As countries strive to meet the SDG goal for maternal health, low income countries with the highest MMR burden struggle to identify interventions to reduce the high MMR. One way of reducing maternal mortality is by improving the availability, accessibility, quality and use of services to manage and treat complications that arise during pregnancy and childbirth.

Emergency Obstetric Care (EmONC) services are collectively known as emergency care services for women and newborns during delivery and the time after delivery (postpartum period) if or when a woman or her newborn experiences serious complications. According to global evidences, it is estimated that up to 15 per cent of expected births develop life- threatening complications associated with pregnancy, delivery or the postpartum period. The provision of emergency care for women and girls during child birth is recognized as an essential and effective component of obstetric services. Subdivided into two categories basic and comprehensive these services are expected to be provided in both primary and secondary health care facilities.

## **Rationale**

As already discussed above, EmONC is regarded as a critical strategy for the reduction of maternal and newborn mortality. Other strategies such as family planning, skilled birth delivery are also complementary in reduction of maternal mortality. For example, family planning reduces the number of pregnancies and the need for unsafe abortion. Skilled attendance at birth is able to identify risk factors, promote diagnosis, management and referral of complications that require EmONC services. Globally 75% of maternal deaths are as a result of major direct obstetric complications. In Liberia Post-partum hemorrhage, severe pre-eclampsia, eclampsia Sepsis, Unsafe abortion are the leading cause of maternal mortality while newborn mortality is as a result of asphyxia, newborn sepsis, prematurity.

EmONC services can be described as evidence based lifesaving interventions or signal functions used to treat direct obstetric complications as well as immediate complications for the newborn. These signal functions are traditionally described at two levels in the health care delivery system namely basic and comprehensive. According to the UN handbook on EmONC, nine (9) signal functions define EmONC services at the comprehensive level commonly referred to and CEmONC. At the Basic level or BEmONC seven (7) signal functions have been defined. These signal functions are also considered as a collective service required during emergency. These functions or services must be available 24 hours a day and 7 days a week.

## **EmONC Signal Functions**

### **Seven Basic EmONC Signal Functions**

1. Administration of parenteral (Intravenous(IV), intramuscular(IM)) antibiotics
2. Administration of parenteral (IV, IM) anticonvulsants, ex: Magnesium Sulphate
3. Administration of parenteral (IV, IM) oxytocic
4. Manual Removal of Placenta
5. Removal of retained products, ex manual vacuum aspiration
6. Assisted vaginal delivery (with vacuum extractor or forceps)
7. Neonatal resuscitation with bag and mask

### **Comprehensive EmONC Signal Functions**

All seven BEmONC plus

8. Cesarean Section delivery
9. Blood Transfusion

The availability of EmONC measures the capacity of the health system to respond to direct obstetric and some newborn complications. It is essential to know at what level signal function are performed at various service points in the country and why they are not provided in some facility will guide decision and policy making efforts in the identification and implementation of strategies for improvement.

## **EmONC Indicators**

Recognizing the difficulties and limitation of measuring Maternal and newborn mortality, WHO, UNICEF, UNFPA and the AMDD developed a set of critical indicators to measure the process and outcomes in the reduction of maternal and newborn mortality. These indicators depend on largely data from routine services records to show the availability, utilization and quality of EmONC delivered per level of designated facility. The following indicators captured in the table 1 below;

Table 1: EmONC Indicators

EmONC Indicator	Description	Recommended Level
<b>Availability of emergency obstetric care: basic and comprehensive care facilities</b>	This is the ratio of fully functioning designated EmONC facilities	Every 500,000 pop there must be at least 5 EmONC facility (1 CEmONC and 4 BEmONC)
<b>Geographical distribution of emergency obstetric care facilities</b>	This is the number of facilities providing EmONC services at a subnational or county basis	
<b>Proportion of all births in emergency obstetric care facilities</b>	This is an estimate of how many pregnant women are actually using the facilities	90% (to be discussed during validation as this depends on the country)
<b>Meeting the need for emergency obstetric care: proportion of women with major direct obstetric complications who are treated in such facilities</b>	This is the percentage of women with obstetric complications that are treated in health facilities. The estimated number of women with direct obstetric complications is 15% of all expected births in the population	≤100%
<b>Proportion of all birth that are delivered by Caesarean sections</b>	The C/S rate indicates if adequate proportion of life-saving services are delivered	5-15%
<b>Direct obstetric case fatality rate</b>	Percentage of women with direct obstetric complications who are admitted to a facility and die, an indicator of quality of care	<1%
<b>Intrapartum and very early neonatal death rate</b>	The number of fresh stillbirths (intrapartum deaths) and very early neonatal deaths divided by the total number of deliveries. This is an indicator for the quality of intrapartum and immediate newborn care	<2% (to be discussed during validation)
<b>Proportion of maternal deaths due to indirect obstetric causes</b>	The percentage of maternal deaths due to direct obstetric causes indicates what interventions are needed in addition to EmONC	No target can be set

Used together, these indicators measure the capacity and readiness of the health system to perform life-saving interventions for the major direct obstetric complications. Together they answer the following questions;

1. Are designated EmONC facilities providing signal functions?
2. Are women and girls most in need using these facilities?
3. Are there enough critical life-saving procedure being performed
4. Is the quality of care adequate?
5. In addition to EmONC, what other interventions are needed?



## 1.4.1 Objectives of the Needs Assessment

The overall objectives of this assessment are to:

1. assess the functionality of BEmONC and CEmONC facilities nationwide with reference to the implementation of signal functions; and
2. guide policy, planning and prioritization to strengthen the health system using EmONC as a point of entry.

The specific objectives are to:

1. establish evidence for monitoring the availability, geographic distribution, level of utilization and quality of EmONC (using the EmONC indicators) that could be linked with the HMIS;
2. document the number of signal functions each facility delivers;
3. determine the availability of physical infrastructure, utilities, equipment, supplies and essential drugs for EmONC;
4. describe current staffing patterns and capabilities with regards to EmONC;
5. determine the availability of protocols and guidelines for EmONC services;
6. determine the 24/7 availability of human resources who can perform the signal functions and other essential services; and

## 1.5 Organization of the Report

The EmONC needs assessment report is organized into nine chapters. The first chapter describes the country based on socio-economic indicators, health situation and EmONC service availability. Chapter two provides the needs assessment methodology, including recruitment, training and deployment of field personnel. Chapter three and four describe EmONC services and maternal health condition in Liberia. The next two chapters (5 and 6) present EmONC infrastructure and health workforce availability and capacity to provide adequate and quality EmONC services. Chapter seven is delegated to EmONC drugs, supplies management and stock while chapter eight is focus on referral system and EmONC services. The final chapter (9) provides the assessment conclusion, discussions of key findings and recommendations. The report has references and annexes for large tables including the list of health facilities assessed.

## Chapter Two: Methodology

### 2.1 Overview of the Assessment

This assessment documents the level of implementation of EmONC signal functions in selected health facilities in Liberia. The assessment adapted the United Nations EmONC indicators and needs assessment methodology described in the 2009 document *Monitoring emergency obstetric care: a handbook*, a revision of the 1997 *Guidelines for Monitoring the Availability and Use of Obstetric Services*, which was based on yet an earlier version developed for UNICEF by staff at Columbia University<sup>6</sup>.

### 2.2 Study Design

The study design is a cross-sectional survey and entails visiting public health facilities where childbirth services are provided or could be provided. The data collection teams used multiple techniques for collecting data: interviews with key staff, observation, and data extraction from logbooks, registries, and clinical records.

### 2.3 Sampling Facilities

The sampling frame of the Rapid EmONC was drawn from facilities within the Liberia Master Facility listing of 866 health facilities across the fifteen counties of which there are 472 public health facilities; see Table 2 for distribution.

Table 2: Distribution of Health Facilities in Liberia

County	Total	Ownership		Type		
		Public	Private	Clinic	Health center	Hospital
Bomi	27	24	3	26	0	1
Bong	56	41	15	52	1	3
Gbarpolu	16	15	1	15	0	1
Grand Bassa	35	26	9	31	1	3
Grand Cape Mount	34	32	2	29	4	1
Grand Gedeh	24	22	2	21	2	1
Grand Kru	22	20	2	17	4	1
Lofa	62	55	7	55	3	4
Margibi	58	27	31	42	14	2
Maryland	27	24	3	24	2	1
Montserrado	342	62	280	310	22	10
Nimba	86	53	33	75	5	6
River Cess	20	18	2	18	1	1
River Gee	20	18	2	17	2	1
Sinoe	37	35	2	36	0	1
Liberia	<b>866</b>	<b>472</b>	<b>394</b>	<b>768</b>	<b>61</b>	<b>37</b>

<sup>6</sup> USAID/MEASURE Evaluation: Monitoring and Evaluation Toolkit for EmONC of scale up, 2017.

## 2.4 Selection Criteria and Sample Size

### Secondary Facilities

All public hospitals (excluding specialized hospitals that do not offer delivery) were used as the sampling frame for hospitals. As shown in Table 3 below, there were 24 public hospitals of which 18 were assessed. JFK the country referral hospital was not assessed due to lack of access during the study. Also, Hospitals were not assessed in Maryland, Grand Gedeh and River Gee due to limited resources. However, one public hospitals each was selected from River Cess, Grand Kru and Sinoe to serve as sample representation for hospitals in the south eastern part of Liberia. Lastly, TB Annex and Grant hospitals were exempted due the specialize nature of services they provide.

### Health Centers

Similarly as shown in table 3 below, a sampling frame of all public health centers (40) from the fifteen counties was used. The geographic spread of public health centers within counties served as one of the key factors for selection. A health center was automatically selected if a county had only one health center.

In counties with 2-3 health centers, a health center with the highest delivery caseload was selected. Counties with more than 4 health centers, 2 or more health centers were selected based on geographic spread and number of deliveries in July-June 2019-2020. Based on these criteria, 28 health Centers were selected (See Table 4 below).

### Clinics

From a list of 408 public health clinics, 272 performed 20 plus deliveries between the Months of July-June 2019-2020. From the total of 272 public health clinics in the sampling frame, 60 public health clinics were randomly selected from the listing of 272 health facilities that performed 20 plus delivery. Table 4 below shows further distribution.

*Table 3: Distribution of Public Health Facility by County in Liberia*

Row Labels	Clinic	Health Center	Hospital	Grand Total
<b>Bomi</b>	23		1	24
<b>Bong</b>	38	1	2	41
<b>Gbarpolu</b>	14		1	15
<b>Grand Bassa</b>	25		1	26
<b>Grand Cape Mount</b>	28	3	1	32
<b>Grand Gedeh</b>	19	2	1	22
<b>Grand Kru</b>	15	4	1	20
<b>Lofa</b>	50	3	2	55
<b>Margibi</b>	20	6	1	27
<b>Maryland</b>	21	2	1	24
<b>Montserrado</b>	44	12	5	62
<b>Nimba</b>	46	4	3	53
<b>River Cess</b>	2	1	1	3
<b>River Gee</b>	15	2	1	18
<b>RiverCess</b>	14		1	15
<b>Sinoe</b>	34		1	35
<b>Grand Total</b>	<b>408</b>	<b>40</b>	<b>24</b>	<b>472</b>

*Source: Liberia Master Health Facility Listing*

Table 4: Sample size distribution by Facility Types

Counties	Clinic	Health Centre	Hospital	Grand Total
Bomi	4		1	5
Bong	7	1	2	10
Gbarpolu	4		1	5
Grand Bassa	4	1	1	6
Grand Cape Mount	4	1	1	6
Grand Gedeh	3	1		4
Grand Kru	2	1	1	4
Lofa	5	2	2	9
Margibi	1	5	1	7
Maryland	3	1		4
Montserrado	8	11	4	23
Nimba	6	3	2	11
River Gee	3			3
Rivercess	4	1	1	6
Sinoe	2		1	3
<b>Grand Total</b>	<b>60</b>	<b>28</b>	<b>18</b>	<b>106</b>

## 2.5 Data Collection Instruments and Pre-Testing

### Questionnaire/Tool

Data collection tools have been standardized and used in many countries worldwide. They were developed initially by AMDD and have been adapted locally for every needs assessment. Additionally, the tool was jointly adapted by the Ministry of Health and technical health partners in Liberia.

The following tools are suggested for use in the assessment:

- **Module 1: Identification of Facility and Infrastructure** requires interviewing a person of some authority at the facility and covers background information on the facility - including size/capacity, service hours, overall infrastructure, cost of services and referral system.
- **Module 2: Human Resources** also involves interviewing one or more persons with excellent knowledge of the staffing patterns for obstetric and newborn care and which signal functions the staff provide. It also covers the staffing situation 24 hours a day 7 days a week by the health professionals in that facility.
- **Module 3: Essential Drugs, Equipment & Supplies** examines those medications, equipment, and supplies that are necessary for the delivery of maternal and newborn services. This module is conducted primarily by interview and observation.
- **Module 4: EmONC Signal Functions & Other Important Services** looks at how facilities *actually* function and which life-saving services they provide to treat women and newborns. It also looks at why these services are not available. Performance information will be determined through interview and validation from the registries. If staff says that a retained placenta has been conducted in the last 3 months, they should be able to back up this assertion with clinical records.

- **Module 5 National Data Collection Tool** is a form designed to collect information at the national level. This tool helps the research team gather information such as: district populations, lists of health facilities, national drug lists, scopes of work for midwives, information about referral policies and staffing levels.

## 2.6 Recruitment, Training and Deployment of Field Personnel

### Data Collectors and Supervisors Training

The Ministry of Health recruited individuals with mainly either a diploma or a higher degree in nursing or midwifery, or in other related health backgrounds, to serve as field staff. The assessment team consisted of 8 coordinators (5 from Central MOH, 2 from UNFPA and 2 from UNICEF), 5 supervisors and 16 data collectors.

The training of assessors lasted for 4 days and all assessors attended the training. The supervisors were clinical persons preferably with midwifery skills. Supervisors and data collectors were trained together for the most part, with special sessions directed exclusively for the supervisors. The training was led by members of the core team, field coordinators assigned from the Family Health Division and Research Division of the Ministry of Health, LISGIS, UNFPA and UNICEF respectively.

The training included an overview of the survey objectives, background information on EmONC, standard interviewer techniques, appropriate interviewer behavior, communications skills, a detailed understanding of the training materials. The revision of the tool were carried out firstly using paper-based and later through the use of the gadgets. Pretesting of the tool took place at a nearby facility in Monrovia to allow the teams have first-hand information and practice. Each data collector receive the *Data Collector's Manual* that provides detailed explanations and definitions for questions that may require special instruction in each module to ensure a uniform understanding of the meaning of each question and response choices.

Before the field data collection exercises, data collectors were divided into 7 teams of three, with one member per group serving as a supervisor.

### Pretesting

Pretesting of the modules formed part of the data collector's training to detect problems in the flow of the questions using gadgets, know the length of time required for interviews, and identify problems in the understanding of terms and concepts of the rapid assessment. Issues identified during the pretest were review, corrected and formed part of the assessment.

## 2.7 Data Collection and Management

### Data Collection and Organization of Field Work

All seven teams were firstly deployed for a week in Monrovia since it had huge portion of the sample. Also, deployment in Monrovia was necessary to monitor teams performance and make necessary adjustments before deployment to far away counties. Upon completion in Monrovia, the teams were deployed in the remaining 14 counties for a period of two weeks.

Field data collection started in March 2020 but due to the wide spread of COVID, the team were called from the field and later returned in June to complete the field exercise. The data collection was carried out using programmed tablets. The tablets were used to collect and transmit data automatically while in the field. Upon completion, the data files were exported into CSV, SPSS and/or STATA files for analysis.

The Ministry of Health supported by LISGIS, UNICEF and UNFPA coordinated the conduct of the Rapid EmONC Assessment. other members of the core team will be responsible for the conduct of the survey. The Research Unit supported by LISGIS were responsible for developing the data entry programs within the gadgets and run the preliminary tables of the clean data upon completion of the field exercise.

Since the unit of analysis for all modules in this assessment is a health facility or the data is about the health facility, selection of respondents was not an issue; those who provided facility data ranged from facility in-charges and medical directors to health service providers in the maternity, pharmacy, operating theatre (OT), laboratory and elsewhere in the facility. Additionally, county clinical supervisors of the fifteen counties provided support for the data collectors by ensuring the readiness of the facilities to received team members of the assessment. Where there were issues or challenges with accessing a facility, the County Health Clinical Supervisors or Reproductive Health supervisors were immediately contacted assistance.

### **Data Cleaning and Analysis**

The data analysis plan was adapted from an existing EmONC assessment conducted in 2010 in Liberia in addition to the WHO guide for the EmONC assessment. In general, the analysis describes characteristics of health facilities by county, district, location (urban/rural), facility type, facility sector (private/public) and EmONC status (partially functioning, basic, or comprehensive).

Data analysis occurred in two stages: 1) preliminary analysis, and 2) final analysis.

Preliminary data analysis took into consideration defining key stratifying variables (such as county, facility type and ownership and EmONC status), merging databases, creating important new variables and preparing key indicators. Contradictions and other issues were rectified during this preliminary phase. Final analysis were carried out after the data was sufficiently cleaned and certified for the core-team.

## **2.8 Quality Assurance**

Several steps were undertaken to ensure the quality of data collected beginning with adequate preparation for the training, data collection in the field, and data processing particularly during the first phase in Montserrado county. Recruitment of skill assessors with clinical background in addition to previous experience in national health assessment were carried. Data collectors and supervisors took pre- and post-tests to assess their learning and knowledge of the assessment guidelines and standards for data collection. Each data collector and supervisor was given a hard copy manual of the assessment guidelines as a reference in addition to training using gadgets.

Prior to field data collection, communications were sent to all county authorities including County Health Officers, Medical Directors and office of the county superintendent to ensure easy access to selected health facilities. Additionally, every team had an assigned supervisor while 2 to 3 counties were assigned to a national coordinator depending on the sample size per county. During data collection, a supervisor was assigned to each team. As described in the TOR, the supervisors provided support to the data collection teams in form of logistical support, revision of the modules for completeness and ensure transmission of electronic data to the server. Members of the TWG were involved in supportive supervision, spot-checking and validation of the data.

A three man team consisting of a staff from the Research unit and Information, Communication and Technology Unit of the ministry of Health supported by a data manager from LISGIS-the Liberia statistics house were formed to review data submitted to the central server daily. Where inconsistencies were noticed in submitted data, the team supervisor and the national coordinator were contacted to liaise with the specific team with said problem to make correction either in the form of re-visitation where necessary or make revision and re-submit.

## **2.9 Response Rates**

The response rate for this assessment was 100 per cent. Though the teams were faced with challenges at the initial stage of the field exercise due to increase in new cases of COVID-19, the county level management team (County Health Officer, County Clinical Supervisor and County Reproductive Health Supervisor) were very supportive.

## **2.10 Research Ethics**

The assessment protocol was submitted to the IRB and gained ethical clearance before initiating the training. However, the conduct of this assessment met several challenges due to its ethical concern particularly due to COVID-19. Liberia got exposed to this deadly virus March 2020 and the field exercise of the Rapid EmONC Assessment started June 2020 when Liberia begin to record several cases. The survey management team and trainers introduced several Infection Prevention and control measures through training as well as field data collection to mitigate exposure of the study participants. During the training, assessors were placed according to IPC measures particularly the COVID-19. All participants wore mask and every table had sufficient sanitizer to dis-affect their hands and surfaces.

Additionally, the training covered the basic principles of maintaining confidentiality, not just of patients whose records were reviewed, but also of the staff who assist by answering questions about the facility. Finally, a written or verbal consent were obtained from health facility managers as well as staffs responding to the assessors.

## **2.11 Limitations of the Survey**

The implementation of the Rapid EmONC Assessment was met with several challenges particularly due to the COVID-19. The assessment teams were called back from the field due to policy announcement made by health authorities to prevent inter-county movement as a result of huge diagnosis of covid cases across the country. This decision led to shortages of

logistics and time to complete the assessment. Though the team return to the field on a later date, the cost of the assessment was increased by almost one-third of the total cost. Secondly, some county teams were hesitant to accept the teams in their facilities due to fear of exposure to the virus especially when patient could also be asymptomatic. Other important challenge was that at the assessors had to wait for longer period or revisit a facility just to interview the right respondent as per the assessment protocol.



**CHAPTER 3: FACILITY INFRASTRUCTURE  
AND  
COMMUNICATION**

## Chapter Three: Facility Infrastructure and Communication

It is essential for a health facility to have the necessary equipment and facilities accessible in order to provide high-quality treatment for pregnant women and newborns. Even if infrastructure alone cannot ensure high-quality services, inadequate infrastructure would make it impossible to provide such services. As shown in table 5, nationally, a total of 106 health facilities were accessed which included 18 hospitals, 28 health center, and 60 clinics.

Of the total hospitals accessed, Sinoe County high a higher proportion follow by Grand Kru, and Lofa counties with 33.3%, 25%, and 22.2%, respectively. No hospital assessment was done in Maryland, Grand Gedeh, and River Gee counties. Bomi, Sinoe, Gbarpolu, and River Gee counties have no health centers, therefore, no health center assessment was conducted.

Relative to assessment of clinics, over 75% of the clinics in River Gee, Gbarpolu, Bomi, Grand Gedeh and Maryland counties were assessed. Across all health facility types, urban area had higher proportion of health facilities assessed as compared to rural, Table 5.

### 1.1 Facility Information

Table 5: Distribution of surveyed facilities according to facility type, by county and operating agency

National	Type of health facility			
	Hospital	Health Center	Clinic	All facilities
	18	28	60	106
<b>County</b>				
Bomi	20.0	0.0	80.0	5
Bong	20.0	10.0	70.0	10
Grand Bassa	16.7	16.7	66.7	6
Grand Cape Mount	16.7	16.7	66.7	6
Grand Gedeh	0.0	25.0	75.0	4
Grand Kru	25.0	25.0	50.0	4
Lofa	22.2	22.2	55.6	9
Margibi	14.3	71.4	14.3	7
Maryland	0.0	25.0	75.0	4
Montserrado	17.4	47.8	34.8	23
Nimba	18.2	27.3	54.5	11
Rivercess	16.7	16.7	66.7	6
Sinoe	33.3	0.0	66.7	3
River Gee	0.0	0.0	100.0	3
Gbarpolu	20.0	0.0	80.0	5
<b>Total</b>	<b>17.0</b>	<b>26.4</b>	<b>56.6</b>	
<b>Residence</b>				
Urban	26.2	37.7	36.1	61
Rural	4.4	11.1	84.4	45

## 1.2 Ratio of Beds to Deliveries

Oftentimes, the quality of medical treatment available at a certain facility may be judged by looking at factors like the number of available beds and the rate at which babies are being born there. However, Liberia lacks a unified metric for measuring the quantity and distribution of beds. To compare the number of beds in Liberia, we utilized the World Health Organization standard of 30 to 32 beds for every 1,000 births in the maternity and delivery rooms of primary referral. Table 6 shows that the number of maternity beds (including obstetrics and labor and delivery) per 1,000 births was within the acceptable range of 30 to 32 beds set by the international standards.

There were only 16 to 29 maternity beds available per 1,000 births in five of the 15 counties (Gbarpolu, Grand Cape Mount, Grand Gedeh, Grand Bassa, and Nimba). However, River Cess and Margibi exceeded the ratio of maternity beds per 1,000 births, with 55 and 53 respectively. The required number of beds per 1,000 births was met by hospitals, but not by health clinics or community health centers.

Additionally, Table 6 displays the number of beds used just for labor and delivery per 1,000 deliveries. The international standard specifies six to eight beds per 1,000 deliveries, and Liberia fulfilled this requirement with 10 beds per 1,000 births that were solely designated for labor and delivery. All counties met the international standard with a range of 6 to 27.

Table 6: : Ratio of maternity beds and delivery tables to 1000 deliveries, by County and facility type

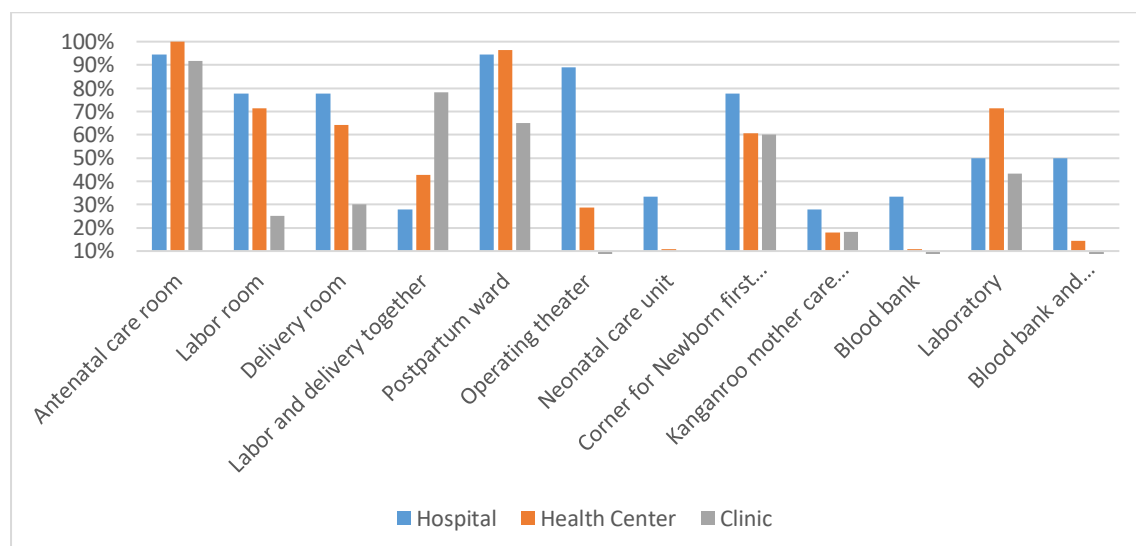
	Facilities	Institutional Deliveries (June 2019- July 2020)	Number of:			Ratio of obstetrics beds to 1,000 deliveries	Ratio of labour and delivery beds/couches to 1,000 deliveries	Ratio of obstetrics + labour and delivery beds/ couches to 1,000 deliveries
			All beds	Beds exclusive for obstetrics	Beds exclusive for labour & delivery			
<b>National</b>	<b>106</b>	<b>35253</b>	<b>2344</b>	<b>779</b>	<b>368</b>	<b>22.1</b>	<b>10.4</b>	<b>32.5</b>
<b>County</b>								
Bomi	5	737	117	20	10	27.1	13.6	40.7
Bong	10	7201	235	119	94	16.5	13.1	29.6
Gbarpolu	5	1012	18	10	6	9.9	5.9	15.8
Grand Bassa	6	2337	126	45	19	19.3	8.1	27.4
Grand Cape Mount	6	1153	83	13	11	11.3	9.5	20.8
Grand Gedeh	4	956	44	15	8	15.7	8.4	24.1
Grand Kru	4	465	70	16	6	34.4	12.9	47.3
Lofa	9	3368	190	69	35	20.5	10.4	30.9
Margibi	7	2405	210	94	33	39.1	13.7	52.8
Maryland	4	543	21	13	6	23.9	11.0	35.0
Montserrado	23	7475	617	176	75	23.5	10.0	33.6
Nimba	11	5842	403	127	41	21.7	7.0	28.8
Rivercess	6	830	94	36	10	43.4	12.0	55.4
River Gee	3	150	8	3	4	20.0	26.7	46.7
Sinoe	3	779	108	23	10	29.5	12.8	42.4
<b>Health Facility Type</b>								
Hospital	18	9295	1400	377	146	40.6	15.7	56.3
Health Centre	28	11132	533	186	107	16.7	9.6	26.3
Clinic	60	14826	411	216	115	14.6	7.8	22.3

### 1.3 Availability of Spaces Availability of Separate Rooms or Designated Spaces for Maternal and Newborn Health Services

Annex A table 1 shows the facilities with separate room or space for selected maternal and newborn services, by County, facility type and Area of Residence. Nationally, 94% of the facilities had separate rooms for antenatal care (ANC) and 78% had a postpartum ward. Less than 50% of the facilities had delivery room, 46% had labor room and 60% had combined labor and delivery room.

As shown in figure 1 below, of the total hospitals assessed, 89 per cent of them had an OT. Though health centers may not be required to have an OT, 29 per cent of them had an OT. Majority (63%) of the hospitals, health centers and clinics assessed had corners for newborn first aid/care. About 52% of the facilities had laboratory. The least availability space or rooms in health facilities were Neonatal care unit (14%), Blood Bank (10%), Blood bank and laboratory together (15%) and kangaroo mother care area (20%). About 33% and 50% of the hospitals had blood bank and laboratory respectively. Annex A: table 1 shows detail distribution.

Figure 1: Percentage of facilities with separate room or space for selected maternal and newborn services, by County, facility type and Area of Residence, Liberia Rapid EmONC Assessment 2020



### 1.4 Availability of Electricity

Electricity and water are essential for the daily running of health care facilities. Electricity is required for the delivery of quality health services, as well as the safety of clients and providers at all levels of the facilities. It is also required for the operation of equipment whose failure jeopardizes the supply of health services. Health facilities' access to electricity was assessed, as were power sources and whether the electricity was functioning on the day of the assessment. Findings from Table 7 shows that from the facility assessed, 93 percent had a source of electricity.

Nationally, below a third (13.1 percent) of facilities were connected to the grid. Despite connection to the grid being very low, 64.6 percent of the facilities had a solar-powered electric source. Two out of the 15 counties had facilities with full coverage of electricity from any

source. From the primary sources of electricity with regards to health facility type, solar is most commonly used (83.9 percent) in clinic as compare to health centers and Hospitals.

*Table 7: Percent distribution of facilities according to source of electricity by county, facility type, and Residence*

National			Primary source of electricity		
	Facilities	Electricity	Power grid	Generator	Solar
	<b>106</b>	<b>93</b>	<b>13.1</b>	<b>22.2</b>	<b>64.6</b>
County					
<b>Bomi</b>	5	100	0.0	0.0	100.0
<b>Bong</b>	10	100	0.0	20.0	80.0
<b>Grand Bassa</b>	6	83	0.0	20.0	80.0
<b>Grand Cape Mount</b>	6	100	0.0	50.0	50.0
<b>Grand Gedeh</b>	4	100	0.0	25.0	75.0
<b>Grand Kru</b>	4	100	0.0	75.0	25.0
<b>Lofa</b>	9	89	0.0	25.0	75.0
<b>Margibi</b>	7	86	50.0	0.0	50.0
<b>Maryland</b>	4	75	0.0	33.3	66.7
<b>Montserrado</b>	23	100	34.8	21.7	43.5
<b>Nimba</b>	11	82	22.2	11.1	66.7
<b>Rivercess</b>	6	100	0.0	33.3	66.7
<b>Sinoe</b>	3	100	0.0	33.3	66.7
<b>River Gee</b>	3	67	0.0	0.0	100.0
<b>Gbarpolu</b>	5	100	0.0	0.0	100.0
Residence					
<b>Urban</b>	61	93	22.8	28.1	49.1
<b>Rural</b>	45	93	0.0	14.3	85.7
Facility Type					
<b>Hospital</b>	18	100	27.8	61.1	11.1
<b>Health Centre</b>	28	89	28.0	12.0	60.0
<b>Clinic</b>	60	93	1.8	14.3	83.9

### Electricity Interruption

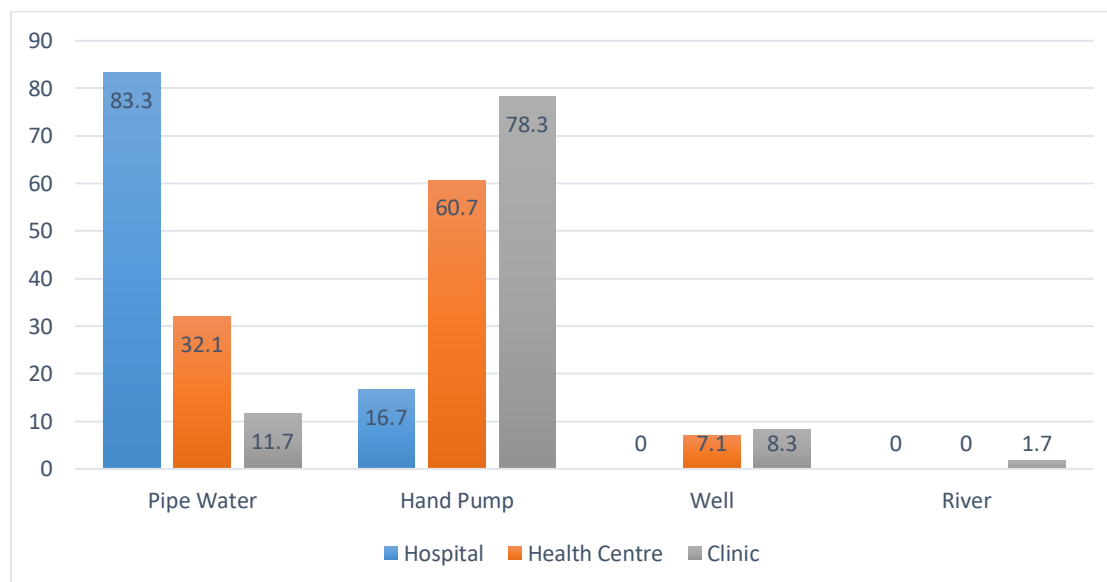
One of the many challenges facing Liberians is the frequent interruption of electricity. This is even more visible in health facility settings. Nowadays, electricity interruptions are most common in developing regions. Annex A Table 2 shows that 33% of the facilities visited had experienced interruptions electricity in the last month prior to the survey. Disaggregation shows that 24% of the facilities had interruption of electricity for more than 2 days while 1.9% had interruption for less than 2 days. This interruption is worrisome, particularly for counties with longer interruption of electricity as most mothers with direct obstetric complications require treatment in less than a couple of hours. Interruptions for more than two days were very common among facilities in Grand Gedeh (75%), Grand Kru (75), Margibi (42%) and Grand Cape Mount (34%). Clinics had 78% that experienced uninterrupted electricity most due to the high availability of solar panels (83%) as stated above. More (55%) of health centers experienced interruption of electricity for more than two days compared to Hospitals (33%).

## 1.5 Availability of Water

Water is one of the basic necessities of life and a key amenity for health facilities. It is used for drinking, cooking, infection prevention, bathing and laundry. Health facilities were questioned about the availability of water and the sources of water in their facilities.

**Annex A: Table 3** shows that of all facilities assessed 95 percent had water available and the primary sources of water revealed that Pipe water account for 29.0 percent, hand pump 59.0 percent, well 7.0 percent, river 1 percent and other sources (4.0 percent). All hospitals and health centers had water available. Unlike facilities in other counties, all facilities assessed in Grand Gedeh and Sinoe counties had hand pump as their primary source of water. Though with water, River Gee had the lowest availability of water (33%) compared to other counties. In figure 2 below, higher proportion of hospitals had pipe water (83%) as the main source of water compared to 33% health center and 11% clinics. Majority of the primary facilities had hand pump as their main source of water. Few clinics (8%) and health centers (7%) had well as the main source of water.

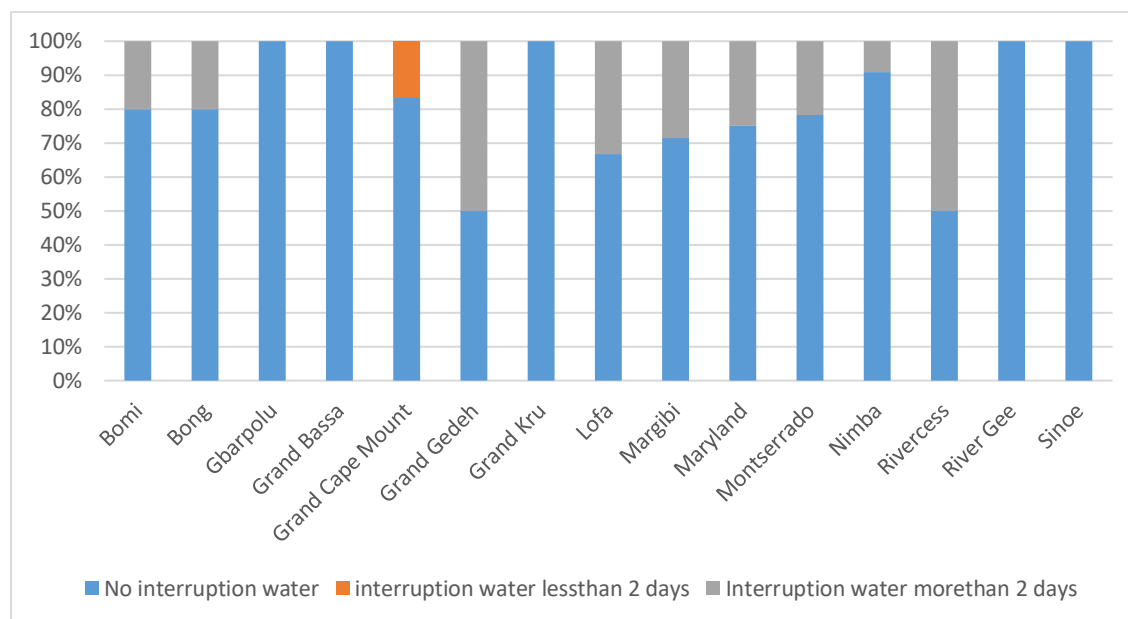
*Figure 2: Percentage distribution of primary source of water (from those that had a source of water)*



## Interruption of Water Supply

As shown in Figure 3 below and **Annex A: Table 4**, interruptions of water supply across health facilities that had water (101) was at 15.5% (16 Health Facilities) of which less than 1% (1 health facility) had interruption of water supply for less than 2 days while 15% had interruption of water for over two days. Five counties (Sinoe, River Gee, Grand Gru, Gbarpolu and Grand Bassa had no experienced of water shortage before the day of the survey. Among counties that experienced water shortages, River Cess and Grand Gedeh had higher percentages of facilities (50%) compared to others.

Figure 3: Figure 5.4.2: Percentage distribution of facilities that had shortages of water for days (from those with water)



## 1.6 Infrastructure in Maternity Ward

Health facilities were also assessed questions regarding availability of amenities such as infrastructure, furniture, bed availability and storage and miscellaneous in the maternity and the labor and delivery wards (Table 8). Most facilities (87.7 percent) acknowledged that they had sufficient lighting during the day, but fewer than two thirds of the facilities said they had sufficient light during the night. Availability of sufficient lighting during the night ranged from the highest proportion of facilities in Hospitals (94.4 percent). Quite a large proportion of the facilities said that they had means of ventilation (84.9 percent) but only 49.1 percent of them reported they had heating. Quite a low proportion of facilities reported mentioned that they had functional fans or air-conditioning (25.5 percent).

Ninety-three percent of the facilities said they had a functioning toilet in the maternity ward. However, only 30.2 percent had running water in the maternity ward. Running water was more likely available in hospitals than health centers/clinics.

Table 8 below presents selected furniture and amenities in the maternity ward. Nationally, examination tables were widely available, available in 98 percent of facilities, followed by the beds (97 percent). A large majority of the facilities (74.5 percent) had empty beds clean and ready for the next patients. Quite a low proportion of the facilities (11.3 percent) mentioned that facilities provided food to patients. Provision of food was not a common practice among clinics and health centers. Facility cleanliness is one of the key criteria for infection prevention and safe and clean service delivery. Only 4.7 percent of the facilities had spills or trash observed on their floors.

*Table 8: Percentage of facilities with infrastructure, selected furnishings and amenities in the maternity area, by type of facility*

	Hospitals (n=18)	Health Centers (n=28)	Clinics (n=60)	All facilities (n=106)
<b>Infrastructure</b>				
Sufficient light source to perform tasks during day	94.4	82.1	88.3	87.7
Sufficient light source to perform tasks at night	88.9	64.3	76.7	75.5
Means of ventilation	100.0	71.4	86.7	84.9
Running water	72.2	32.1	16.7	30.2
Functioning toilet	94.4	100.0	88.3	92.5
Heating/ heating arrangements	83.3	50.0	38.3	49.1
Functional fan/ air conditioning	83.3	21.4	10.0	25.5
Curtains/ means of providing patient privacy	88.9	57.1	68.3	68.9
Waiting area for visitors and family	94.4	82.1	78.3	82.1
<b>Furnishings</b>				
Instrument trolley	77.8	42.9	16.7	34.0
Instrument tray	77.78	71.4	56.7	64.2
Beds	100.0	96.4	96.7	97.2
Linens	88.9	71.4	68.3	72.6
Blankets for cold weather	38.9	32.1	40.0	37.7
Water filter (or other means to make potable water available to patients and staff)	55.6	21.4	25.0	29.3
Wheelchair	94.4	60.7	28.3	48.1
Stretcher with trolley	88.9	50.0	18.3	38.7
Examination table	100.0	96.4	98.3	98.1
Labor/delivery table with stirrups	77.8	64.3	70.0	69.8
Labor/delivery table without stirrups	61.1	53.6	45.0	50.0
<b>Bed availability and storage</b>				
Empty beds for next patients are available	83.3	89.3	65.0	74.5
Empty beds are clean and ready	100.0	84.0	94.9	92.4
Facility has any beds in storage	26.7	4.0	12.8	12.7
Facility has 1 - 5 beds in storage				
Facility has > 5 beds in storage				
<b>Miscellaneous Items</b>				
Food is provided to patients by facility	38.9	10.7	3.3	11.3
Liquid spills or trash observed on floors	5.6	3.6	5.0	4.7

## 1.7 Availability of Modes of Communication

Patients' care nowadays appears to entail a large number of people, all of whom must share patient information and discuss their management. As such communication is cardinal to several aspects of management, clinical care and referral systems at all levels of the health systems. Resources are constantly limited and upgrading every lower level health facility to a higher level of care is challenging; hence, communication and transportation bridge the gap by transporting patients who require a higher level of care or surgery from lower level health facilities to referral hospitals. Feedback is also made easier by having easy access to several modes of communication.

Most maternal and newborn issues require a prompt response, so on-site communication is essential for healthcare workers to swiftly access and make calls rather than having to reach out to communication systems outside the health facility. However, only 28% of the facilities owned cell phones; moreover, in health facilities across the country, landlines appeared to be unavailable or non-functional; only 3.8 percent of facilities had a landline. Contrary, personal



cell phones were widely available in all facilities, despite a significant gap in the availability of facility-owned landlines or cell phones. Only 15.6 percent of facilities with staff who had their own cell phone had a policy to reimburse them for using their personal phones for work-related calls, despite the fact that 94.3 percent of facilities with staff who had their own cell phone utilized for work-related calls.

As a result, if the facilities had a policy of reimbursing health workers or individuals for airtime used, they may utilize their own phones to meet the facility's demands, especially in emergency situations. In all health facilities assessed in Rural areas, availability of cell phones owned by staff was more common than in Urban areas.

A two-way radio was one of the key communication devices that health facilities used if did not have direct access to a network signal or telephone connections. Only 2.8 percent of Liberia's health facilities possessed a working two-way radio, and its distribution is concentrated in just three (3) of the country's fifteen (15) counties.

When it comes to cell phone communication, the availability of a network signal is critical to its operation. The procedure of getting online, making /receiving a phone call, or sending a text message is a challenge in health facilities with weak or non-existent signal coverage. **Annex A: Table 5** shows that from facilities that reported availability and use of a cell phone, quite a large proportion of the facilities that had a very dependable cell phone signal accounting for 90.6 percent.

**CHAPTER 4: EMERGENCY OBSTETRIC  
AND  
NEWBORN CARE HEALTH**

## Chapter Four: Emergency Obstetric and Newborn Care Health

The “UN process indicators” for monitoring EmONC availability, use, and quality are presented in Chapter 4. These EmONC indicators, which focus on the collection of life-saving interventions or signal functions are used to address direct obstetric complications for maternal mortality across the country. Moreover, these indicators provide a systematic strategy to reviewing healthcare systems and planning long-term health initiatives within the country. The indicators often have recommendations for minimum standards but countries are encouraged to perform above expected standards. Local realities may also dictate that oversupply or higher levels of performance are indicated in some areas.

Data for these indicators were extracted from different register books which includes, labour and delivery, OT, discharge, referral, PMTCT, FP, malaria, and other registers over 12 consecutive months.

### 4.1 Availability of EmONC Services

This indicator provides a standard requirement for qualifying a facility as functionally Basic Emergency Obstetric and Neonatal Care (BEmONC) is if seven signal functions (including one of the seven neonatal signal functions - newborn resuscitation) have been performed in the three months prior to the assessment. In addition to the seven core signal functions, a facility qualifies as functionally comprehensive Emergency Obstetric and Neonatal Care (CEmONC) if it offers caesarean delivery and blood transfusion services. In the event that facilities do not meet the standards for these 2 requirements/classifications, they are classified as partially functioning facilities.

*(At least one Comprehensive EmONC facility and four Basic EmONC facilities per 500,000 people are recommended as a minimum.)*

#### Availability of EmONC Services by Health Facility

**Annex A: Table 6** and figure 4 below shows the performance of signal functions by facility type, designation and county. The table reveals that majority of health facilities across Liberia provided parenteral oxytocic (96.2%) whereas administering parenteral antibiotics was 55.7%.

The lowest percentage of all signal functions was found in Grand Gedeh county, which had an average of 28.6% for BEmONC and 22.2% for CEmONC, respectively. This was the lowest proportion of all signal functions found in any county among health facilities assessed. This is much lower than the national average, which is 70.6% for BEmONC and 59.2% for CEmONC. With the exception of Grand Gedeh and River Gee counties, all facilities in every county offered some kind of parenteral antibiotic treatment. At a similar manner, parenteral oxytocics were made available in all health facilities throughout all counties, with the exception of Maryland (7%), River Gee (66.7%), and Grand Gedeh (50%). For the treatment of pre-eclampsia and eclampsia, all of the institutions in the counties supplied some kind of anticonvulsant medication, with the exception of Grand Gedeh. The removal of retained products of conception was the primary signal function that was performed the least, and the manner in which it was done varied greatly across the counties. AVD was carried out the greatest amount in nine counties: Bomi, Bong, Grand Cape Mount, Grand Gedeh, Grand Kru, Nimba, Rivercess, and Gbarpolu (100%), with River Gee having the lowest percentage (66.7%). When comparing the effectiveness of parental oxytocics across districts, researchers

found that the percentage distribution was rather consistent. Eleven of the fifteen counties have more than half of their facilities capable of offering infant resuscitation services. Obstetric surgery, including cesarean sections, as well as blood transfusions for patients who need them were only available at a relatively limited number of hospitals throughout all of the counties. This might be explained by the fact that the number of clinics and health centers that are potentially providing these two signal functions is greater than the number of hospitals. In terms of location, the urban regions performed a much larger proportion of signal functions as compared to the rural areas.

Figure 4: Percentage of facilities that performed each EmONC signal function in the last three months

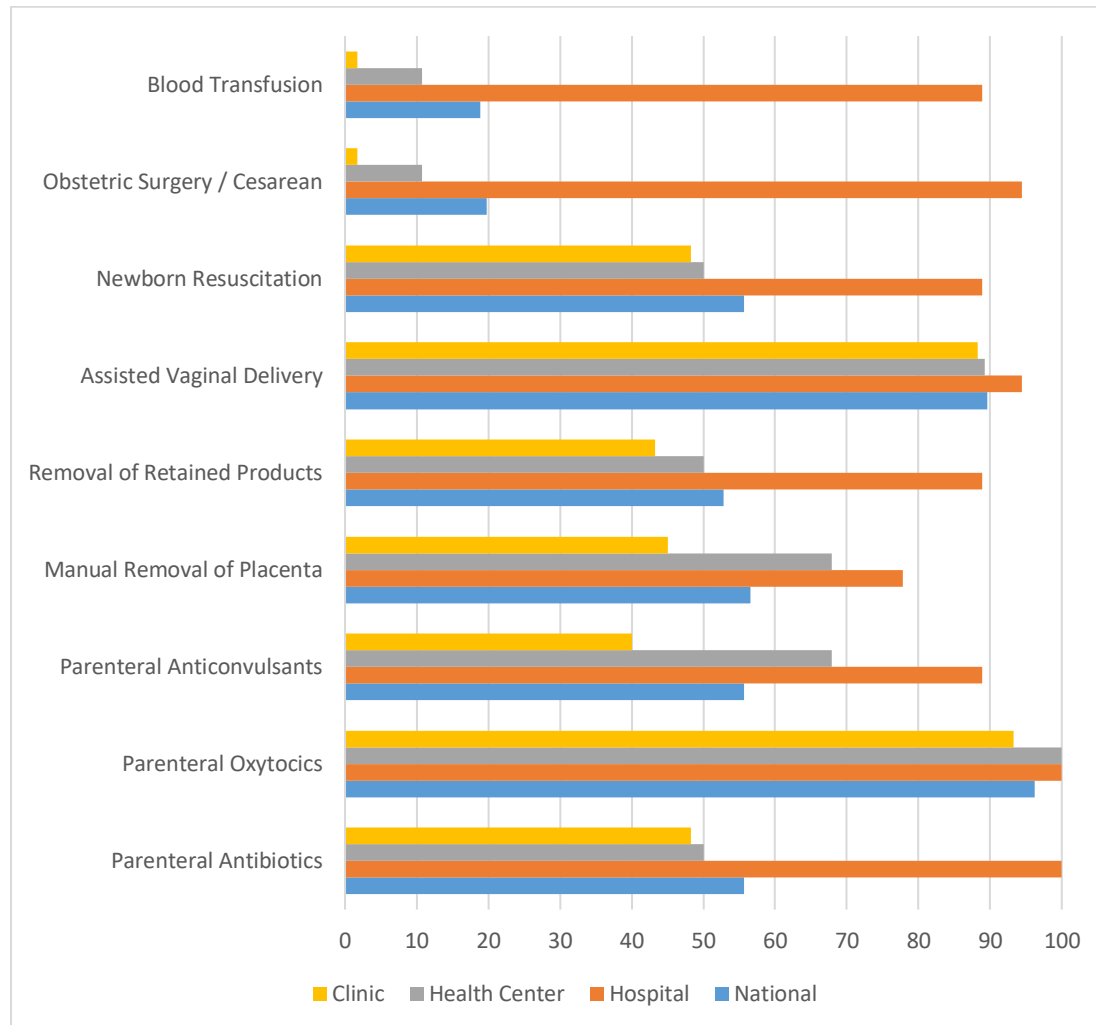


Table 9 below shows reasons for non-performance of the signal function. Among all facilities, the least performed signal functions were Obstetric surgery/cesarean and blood transfusion and this is as a result of hospitals being the responsible and potential facilities performing these two signal function and moreover health centers and clinic outnumber hospitals. Reasons for non-performance for these two signal functions, were policy issues (unsupportive or no policy). Similarly, the removal of retained products of conception was the second least performed signal function among all facilities. The main reason proffered for the non-performance was no indication that warranted AVD (72 per cent). Lack of drugs/equipment, lack of training and lack of human resources were other cited reasons. The provision of CS in hospitals was also challenged as 71 per cent of those that did not provide it mentioned management issues (providers desiring compensation, encouragement to use other alternatives, being

uncomfortable or unwilling to perform this procedure), followed by lack of training (43 per cent) and lack of human resources (43 per cent) to provide surgery. A similar distribution of reasons was cited for the provision of blood transfusion

*Table 9: Percentage of facilities that performed each signal function in the last 3 months and reasons for not providing, by signal function*

Signal Function	Percentage of facilities (N=106) that provided the procedure in the last: 3 months	Number of facilities that did not perform the procedure in the last 3 months	Percentage of facilities that responded that the procedure was not provided in the last 3 months due to lack of (multiple responses allowed):						
			Availability of human resources	Training issues	Supplies/ equipment/ drugs	Management issues	Policy issues	No indication	Other
Parenteral antibiotics	55.7%	47	4.3	0.0	14.9	0.0	2.1	80.9	0.0
Parenteral oxytocic	96.2%	4	0.0	0.0	50.0	0.0	0.0	50.0	0.0
Parenteral anticonvulsants	55.7%	47	4.3	2.1	17.0	4.3	4.3	72.3	2.1
Manual removal of placenta	56.6%	46	4.3	0.0	0.0	0.0	2.2	91.3	4.3
Removal of retained products	52.8%	50	8.0	2.0	4.0	0.0	0.0	84.0	4.0
Assisted vaginal delivery	89.6%	11	27.3	18.2	63.6	9.1	0.0	0.0	9.1
Newborn resuscitation	55.7%	47	27.3	18.2	63.6	9.1	0.0	0.0	9.1
Obstetric surgery/ cesarean	19.8%	85	11.8	7.1	8.2	7.1	60.0	37.6	7.1
Blood transfusion	19%	86	5.8	1.2	7.0	8.1	58.1	38.4	10.5

## 4.2 Choices Regarding Drugs and Equipment for Performing the Signal Functions

### Provision Of Parenteral Uterotonics

The provision of parenteral uterotonics across health facilities assessed was 96.2%. When disaggregated by types of parenteral uterotonics, 98 per cent of all the facilities use Oxytocin while 2 percent use either both or all three signal function. Similarly, all the facilities in 13 counties provided Oxytocin. Oxytocin is the drug of choice for augmentation of labor and for active management of third stage of labor (AMTSL). Table 10 below shows further distribution.

*Table 10: Percentage of facility by type of parenteral uterotonics administered in the last 3 months by County*

National	Total number of facilities	Percentage of facilities that administered Parenteral uterotonics in last 3 months	Among facilities that administered parenteral uterotonics in the last 3 months, percentage that used:			
			Oxytocin	Ergometrine	Misoprostol	Used all 3 or both
	<b>106</b>	<b>96.2</b>	<b>98</b>	<b>0</b>	<b>0</b>	<b>2.0</b>
County						
Bomi	5	100	80	0	0	20
Bong	10	100	100	0	0	0
Gbarpolu	5	100	100	0	0	0
Grand Bassa	6	100	100	0	0	0
Grand Cape Mount	6	100	100	0	0	0
Grand Gedeh	4	50	100	0	0	0
Grand Kru	4	100	75	0	0	25
Lofa	9	100	100	0	0	0
Margibi	7	100	100	0	0	0
Maryland	4	75	100	0	0	0
Montserrado	23	100	100	0	0	0
Nimba	11	100	100	0	0	0
Rivercess	6	100	100	0	0	0
River Gee	3	66.7	100	0	0	0
Sinoe	3	100	100	0	0	0

### Provision Of Parenteral Anticonvulsants

Anticonvulsants injection is very key to treatment of eclamptic seizures if given in a timely manner. According to WHO's guidelines, magnesium sulphate injection is the drug of choice. Table 11 below shows that 56% of the 106 health facilities visited provided parenteral anticonvulsants in the last three months prior to the survey. Over two-third of the facilities assessed (84 per cent) used magnesium sulphate only. Twelve per cent of the facilities that provided parenteral anticonvulsants used both magnesium sulphate and diazepam. A very small proportion (2%) of those facilities providing parenteral anticonvulsants used phenobarbital while 7% used diazepam.

*Table 11: Percentage of facility by type of Parenteral anticonvulsants administered in the last 3 months by County*

National	Total number of facilities	Percentage of facilities that administered Parenteral anticonvulsants in last 3 months	Among facilities that administered parenteral anticonvulsants in the last 3 months, percentage that used:			
			Magnesium sulfate	Diazepam	Both	Phenobarbital
	<b>106</b>	<b>56.0</b>	<b>84</b>	<b>7</b>	<b>12</b>	<b>3</b>
County						
Bomi	5	40	100.0	0.0	0	0
Bong	10	60	83.3	0.0	0	17
Gbarpolu	5	60	100.0	0.0	0	0
Grand Bassa	6	66.7	100.0	0.0	0	0
Grand Cape Mount	6	33.3	50.0	0.0	0	50
Grand Gedeh	4	0	0.0	0.0	0	0
Grand Kru	4	25	100.0	0.0	0	0

Lofa	9	77.8	71.4	28.6	0	0
Margibi	7	71.4	80.0	20.0	0	0
Maryland	4	25	100.0	0.0	0	0
Montserrado	23	69.6	68.8	6.3	25	0
Nimba	11	63.6	100.0	0.0	0	0
Rivercess	6	33.3	100.0	0.0	0	0
River Gee	3	66.7	100	0.0	1	0
Sinoe	3	33.3	100	0.0	1	0

### Removal of retained products of conception:

Table 12 below shows that 52.8% of the 106 facilities visited provided removal of retained products of conception using vacuum, dilatation and curettage (D&C) or dilatation and evacuation (D&E) procedures. Manual removal (84%) was the most widely used procedure for the provision of this signal function in those facilities that removed retained products of conception followed by Misoprostol (79%) and Vacuum aspiration (53%). Dilatation and curettage and Dilatation and evacuation were performed in 14% the facilities that removed retained products of conception, respectively. Vacuum aspiration was the most widely used procedure when performing this signal function among 3 counties (Mary Land, Grand Kru and Grand Cape Mount).

Table 12: Percentage of facility that performed type of removal of retained products of conception administered in the last 3 months by County

National	Total number of facilities	Percentage of facilities that performed removal of retained products of conception in the last 3 months	Has removal of retained products of conception been performed in this facility in the last 3 months				
			Vacuum aspiration	Dilatation and curettage (D&C)	Dilatation and evacuation (D&E)	Manual Removal	Misoprostol
	106	52.8	53	14	14	84	79
County							
Bomi	5	40	50	0	0	100	100
Bong	10	70	43	29	29	100	100
Gbarpolu	5	40	50	50	50	100	100
Grand Bassa	6	83.3	40	0	20	80	60
Grand Cape Mount	6	33.3	100	0	0	50	0
Grand Gedeh	4	25	0	0	0	100	100
Grand Kru	4	25	100	0	0	100	100
Lofa	9	66.7	83	17	0	83	67
Margibi	7	57.1	50	0	0	75	100
Maryland	4	25	100	0	0	100	100
Montserrado	23	65.2	40	13	13	67	73
Nimba	11	45.5	60	40	40	100	100
Rivercess	6	50	67	0	0	100	67
River Gee	3	66.7	50	0	0	100	100
Sinoe	3	0	50	0	0	100	50

### Provision of Assisted Vaginal Delivery (AVD)

Table 13 below reveals that 90% of facilities assessed had performed AVD three months prior to the survey. Over two-third (74%) of the facilities are using vacuum extraction while 1% currently used forceps which is the least performed method. About 25% are using both vacuum extraction and forceps. Unlike other counties, 20% of the facilities assessed in Grand Bassa County used Forceps method. Except for Grand Cape Mount and River Gee, majority of the facilities in other counties are using Vacuum Extractor.

*Table 13: Percentage of facilities by type of AVD performed by County*

National	Total number of facilities	Percentage of facilities that performed AVD in the last 3 months?	AVD has been performed in this facility in the last 3 months		
			Vacuum extractor	Forceps	Both
	106	90	74	1	25
County					
Bomi	5	100	100	0	0
Bong	10	100	70	0	30
Gbarpolu	5	100	100	0	0
Grand Bassa	6	83.3	60	20	20
Grand Cape Mount	6	100	50	0	50
Grand Gedeh	4	100	100	0	0
Grand Kru	4	100	75	0	25
Lofa	9	77.8	71	0	29
Margibi	7	85.7	83	0	17
Maryland	4	75	67	0	33
Montserrado	23	78.3	67	0	33
Nimba	11	100	82	0	18
Rivercess	6	100	67	0	33
River Gee	3	66.7	50	0	50
Sinoe	3	100	67	0	33



### 4.3 Geographic Distribution of EmONC Facilities

Unlike other countries, Liberia have not yet concluded on identifying facilities that should be classified as EmONC facilities or not, though there is a WHO guide on what facilities should perform EmONC services. Therefore, every facility that offer delivery are classified as EmONC facility. There is a work in progress on setting a criteria and identifying facilities that could be an EmONC Facility going forward.

Out of 866 health facilities reporting through Liberia DHIS2, 604 (69%) conducted and reported delivery data to the DHIS2 prior to the assessment of which 5.3% were hospitals, 9.8% health centers and 85% were clinics. Availability of EmONC facilities varied across counties and regions with five counties having majority of the EmONC facilities (Figure 5 and Table 14 below). Distribution by regions reveal that region 2 (Montserrado, Margibi and Grand Bassa) and 3 (Lofa, Bong and Nimba) have higher proportion of EmONC facilities with 37% and 27% respectively. Table 14 below shows further distribution.

Figure 5: Graphical Distribution of EmONC Facilities by County

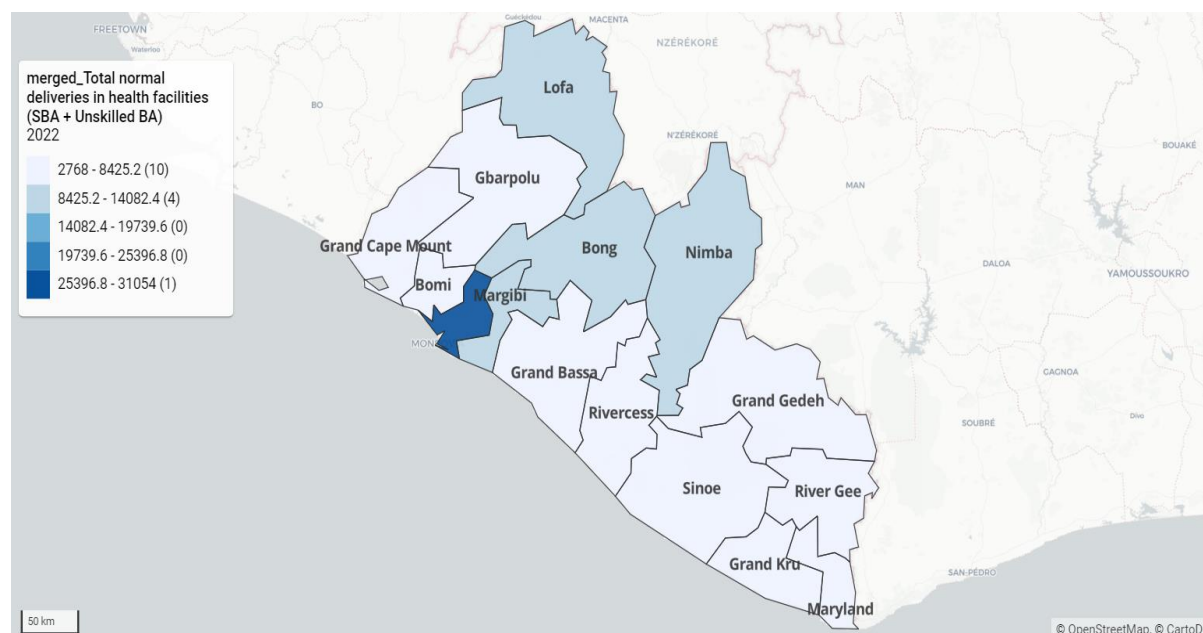


Table 14: Distribution of EmONC facilities by Facility type and County

County	Clinic	Health center	Hospital	Grand Total
Bomi	24		1	25
Bong	39	1	3	43
Gbarpolu	14	1		15
Grand Bassa	28	1	3	32
Grand Cape Mount	29	4	1	34
Grand Gedeh	20	2	1	23
Grand Kru	14	4	1	19
Lofa	50	4	4	58
Margibi	29	11	2	42

Maryland	20	3	1	24
Montserrado	113	20	7	140
Nimba	63	5	5	73
Rivercess	18	1	1	20
River Gee	17	2	1	20
Sinoe	35		1	36
Grand Total	513	59	32	604

#### 4.4 Proportion of birth in Health Facilities (EmONC)

One of the key indicators of EmONC is institutional delivery which provides proportion of pregnant women in the population that give birth in health facilities. Improving institutional delivery so that pregnant women are attended to by skilled birth attendants is key for the reduction of maternal death.

The total number of expected births for Liberia for 2019 was 196456 (calculated Expected Birth multiplied by population, 4,365,696). The total births attended in all facilities with maternity services from 2019 was 113778 (Table 15 below). As shown in the table, the proportion of expected births attended to in health facilities (hospitals and CHCs/clinics) was 58 per cent in all facilities with the highest proportion of women giving birth in Nimba County (95%), Bong (89%), Grand Cape Mount (81%) and Lofa (80%) respectively. The lowest proportion of birth was recorded in Montserrado County. Over 99% of births in facilities were attended to skilled birth attendants. About 517 births were carried out by unskilled staff of which 75% (392) were conducted in Montserrado. Table 15 below shows further distribution.

*Table 15: Percentage of expected births attended in all facilities by County*

County	Projected pop (2019)	Women of Reproductive Age	Expected live-birth	Number of birth in all facilities	Percentage of expected births in facility	Percentage of Birth by SBA
Bomi	105631	24295	4753	1990	42	100.0
Bong	418764	96316	18844	16763	89	100.0
Gbarpolu	104713	24084	4712	2155	46	100.0
Grand Bassa	278388	64029	12527	6607	53	99.7
Grand Cape	159574	36702	7181	5839	81	99.9
Grand Gedeh	157291	36177	7078	5563	79	100.0
Grand Kru	72723	16726	3273	1723	53	99.5
Lofa	347666	79963	15645	12508	80	100.0
Margibi	263608	60630	11862	5483	46	99.9
Maryland	170702	39261	7682	3671	48	98.7
Montserrado	1404214	322969	63190	18113	29	97.8
Nimba	580182	133442	26108	24686	95	99.9
Rivercess	89796	20653	4041	2264	56	100.0
River Gee	83869	19290	3774	2383	63	99.8
Sinoe	128576	29572	5786	4030	70	99.8
<b>National</b>	<b>4365696</b>	<b>1004110</b>	<b>196456</b>	<b>113778</b>	<b>58</b>	<b>99.5</b>

Source: DHIS 2, 2019

#### Quality of Ledgers at Health Facilities

Every 5 years key health technicians across the health sector gathered to review and update various ledgers or registers used within the health facilities. On January 1, 2020, several health

facilities across the Liberia health system begin to use the newly printed and distributed recorders. However, there is still shortage of some of these recorders at several health facilities. Information on what type of register/ledger were used in the health facilities were assessed during the rapid EmONC assessment. In addition, data collectors asked and physically observed whether those register books were complete (all columns filled) and up-to-date (as of the day of visit or the day before). Table 16 below shows the distribution of ledgers or registers in used at facilities and their level of completeness or up to date.

Over 90% of all health facilities irrespective of type , had been using labor and delivery registers (98%), FP (96%), PMTCT (98%), PNC (92%) and ANC (95%). Similarly, higher proportion of the hospitals (94%) were also using Operating theatre.

*Table 16: Percentage of facilities that use registers, by type of facility*

	All Facilities	Labor and delivery ward register	Operating theater register	ANC register	PNC Register	PMTCT Register	Family Planning Register
<b>National</b>	106	98.8	37.3	95.8	92.4	98.3	96.4
<b>Hospital</b>	18	100	94.4	94.4	100	100	94.4
<b>Health Center</b>	28	96.4	14.3	96.4	82.1	100	96.4
<b>Clinic</b>	60	100	3.3	96.6	95	95	98.3

## **CHAPTER 5: PERFORMANCE OF OTHER MATERNAL AND NEWBORN HEALTH SERVICES**

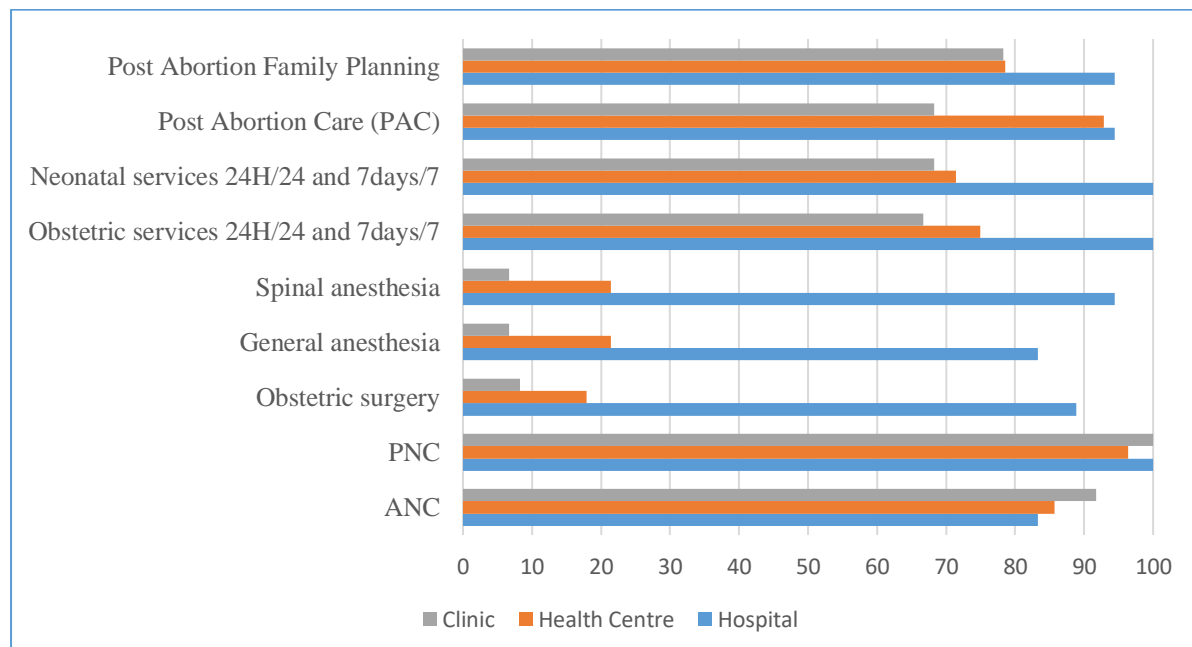
## Chapter Five: Performance of Other Maternal And Newborn Health Services

### 1.4.2 Availability of Routine Services and Performance of other Maternal and Newborn Health Services

Officers-in-charge were questioned in order to ascertain what additional maternal and newborn health services were offered at each location. Data was gathered only with the intention of advancing public health in the areas of MNH. The data came from the respondents themselves. As can be seen in figure 6 below and in Annex A: Table 6 , almost all institutions (98.1%) had given postnatal care services on a nationwide level, however, the proportion of facilities offering ANC services fell below PNC, as was recorded with 88.7%. Seventy-five percent of all institutions offered 24-hour obstetric and neonatal care; seventy-nine percent of hospitals had offered PAC treatments; and eighty-one percent of facilities offered FP after abortion. Acute-care (ANC) and preventive-care (PNC) were available at all rural institutions.

Just 25%, 24%, and 26% of hospitals and clinics throughout the country provide obstetric surgery, general anesthesia, and spinal anesthesia, respectively. Due to the inherently institutional nature of hospitals, over 80% of hospitals provided these services, but only 25% of health clinics and centers did. Additionally, over 37% urban facilities compared to about 5% rural facilities offered these services when distributed by areas of residence. Disaggregation by counties shows that no facilities in Gbarpolu and River Gee was offering obstetric surgery, general anesthesia, and spinal anesthesia.

Figure 6: Percentage of facilities providing selected EmONC services, by facility type



## 5.2 Performance of Other Maternal and Newborn Health Services or Routine Signal Functions in a Three-Month Reference Period

Active Management of Third Stage of Labor (AMTSL), partograph for labor monitoring, necessary newborn care for preterm or low birth weight infants, antenatal corticosteroids, KMC, repair of obstetric fistula, FP for post-abortion women, and other regular signal functions were asked of facilities. **Annex A: Table 7** shows that with the exception of Montserrado (96%), Nimba (91%), and Grand Gedeh (75%), all other counties' facilities have used AMTSL for worker monitoring. Similarly, out of the 15 counties, only 4 said that not every facility had employed a partograph to track labor progress. Only 28% of hospitals reported providing FP techniques for PAC patients. Margibi had the highest proportion (71%) of counties that provided FP techniques to PAC patients, whereas Gbarpolu, Maryland, and River Gee all had none. Predictably, family planning for post abortion care was more often provided by hospitals (78%) than other types of healthcare facilities (57%), and was never provided by clinics (0%).

For **premature and low birth weight infants (Annex A: Table 7)**, 35.8% of institutions offered KMC and 19.8% of facilities supplied corticosteroids. No one county provided KMC from more than 20% of its facilities. Corticosteroids are not provided in any counties in River Gee or Maryland, and only 43% are provided in Margibi. Essential neonatal care for infants born prematurely or with a low birth weight: Similarly low, at just 42.5% of all facilities, was the provision of important neonatal care, such as corticosteroids. There were significant differences in the availability of basic infant care across counties in the three months preceding to the study.

**Repairing an obstetric fistula (Annex A: Table 7)** is a complicated procedure that requires a highly trained medical staff, as well as the necessary medications, medical supplies, and infrastructure found mostly in hospitals. There are dangers and implications for women who develop obstetric fistula, and the service is typically hampered by a lack of funding. Table 4.2.1 shows that just 22 percent of institutions offered obstetric fistula repair and therapy. Grand Bassa, Grand Cape Mount, Montserrado, Nimba, and Lofa were the only jurisdictions to get any of these few establishments.

## **CHAPTER 6: AVAILABILITY OF HUMAN RESOURCES**

## Chapter Six: Availability of Human Resources

A well-trained health workforce is critical to the success of any health-care system. However, crucial shortages, inadequate skill mixtures, and uneven geographic distribution of the health workforce, particularly in low- and middle-income countries (LMICs), offer severe difficulties in achieving universal healthcare coverage (Table 16). Basic information on staffing patterns, availability of health workers 24/7, health worker performance of EmONC signal functions, and other routine maternal and newborn care services were also collected as part of the Liberia rapid EmONC assessment.

### 6.1 Staffing Target and Patterns

The availability of adequate and competent health practitioners is critical to providing high-quality healthcare, particularly for EmONC services. Furthermore, decision-makers and health planners must be aware of the country's human resource situation in order to set a realistic target for the training of various cadres of health providers, as well as for planning, budgeting, monitoring, and evaluation of intervention projects. Table 17 below shows several shortages of staff except for general medical doctors (general practitioner), obstetrician/ gynaecologist general surgeon, pediatrician, and neonatologist categories particularly among hospitals. There were shortages observed across nurses (43), midwives (29), physician assistant (10) and lab technician (10). Of the combined total (88 clinical staff short including Lab technicians), hospitals account for 68% compared to primary facilities. There were fewer gains observed across hospitals.

*Table 17: Total number of health workers currently working, who left and who were posted in the last 12 months, by type of facility and cadre of health worker*

Health worker cadre	Total staffs currently working	Hospitals <sup>1</sup>				Health Centers/Clinics <sup>2</sup>			
		Currently working	In the last 12 months:			Currently working	In the last 12 months:		
			staff left	staff posted	Net gain (loss)		staff left	staff posted	Net gain (loss)
Medical doctor (general practitioner)	86	74	17	17	0	12	1	1	0
Obstetrician/Gynecologist	19	19	4	7	3	0	0	0	0
General surgeon	11	11	3	4	1	0	0	0	0
Pediatrician	6	6	0	1	1	0	0	0	0
Neonatologist	1	1	1	1	0	0	0	0	0
Health officer (non-physician clinician)	94	7	0	0	0	87	7	1	-6
Midwife	475	297	18	2	-16	178	18	8	-10
Nurse	990	652	36	13	-23	338	26	13	-13
Anesthesiologist (MD)	6	6	1	0	-1	0	0	0	0
Nurse anesthetist	61	48	7	1	-6	13	3	2	-1
Nurse midwife	83	55	3	0	-3	28	0	0	0
Physician Assistant	167	119	10	0	-10	48	1	5	4
Laboratory technician	87	48	9	0	-9	39	4	3	-1
Other <sup>3</sup>	396	280	4	6	2	116	5	4	-1



## 6.2 Availability of Health Workers 24/7

The availability of Health workers who are qualified and skilled is essential as patients must be attended to 24 hours a day, seven days a week, because labor, delivery, and obstetric emergencies can occur at any time of day or night.

Health worker cadres whose presence is critical to the management of obstetrics and newborn emergencies are general doctors, obstetrician/gynaecologists, midwives, anaesthetists and neonatologists. Table 17 shows the overall availability of health workers in hospitals, health centers and clinics and whether the cadre was available on-site or on-call on weekdays or weekends, during the day and at night.

From Monday through Friday, all hospitals with the cadre present had a general doctor, Obstetrician/ Gynecologist, general surgeon, paediatrician, midwife, nurse, Anesthesiologist and physician assistant available on-site during the day. The availability of Obstetrician/ Gynecologist (44%) and general surgeon (55%) were the lowest compared to other cadre (100%) in hospitals. Comparing the availability of these cadre in the night during the same time was low particularly when considering general surgeon, Neonatologist and Anesthesiologist on duty. On weekends, only 5.6% per cent of hospitals had an obstetrician/gynaecologist on-duty during the day and 22 per cent at night. General doctor (**table 18 below**) was available in 100% and 60% of the hospitals during the day and at night. Other cadre such as nurses, midwives, physician assistant, laboratory assistant were present and on call at all times.

Similarly for health centers and clinics (**shown in table 19 below**) that had cadre present, there were 100% (nurses, midwives, physician assistants, Lab technicians and Laboratory Assistant) through Monday to Friday day. This is almost similar during the night hours Monday through Friday except for physician assistant (90%) and lab assistant (81%). These trends were similar for weekends (Saturday to Sunday) and holidays.

On the overall, considering all health worker cadres and facility types, staff were more likely to be available on-site during the day than at night from Monday through Friday and during the weekends. The unavailability at night was greatest among obstetrician/gynaecologists, Pediatrician and Neonatologist.

*Table 18: Percentage of hospitals with health workers present on site and on call Monday through Friday and Weekends/holidays day and night*

Hospital (n=18)	Percentage of facilities with cadre present	Mon-Fri Daytime		Mon-Fri night		Sat-Sun/holidays daytime <sup>1</sup>		Sat-Sun/holidays night <sup>1</sup>	
		On-duty	On-call	On-duty	On-call	On-duty	On-call	On-duty	On-call
Obstetrician/ Gynecologist	44	75	25	37.5	62.5	5.6	94.4	22.2	77.8
Medical doctor (general practitioner)	100	100	0	100	0	100	0	61.1	38.9
General surgeon	55.5	50	50	0	100	0	100	0	100
Pediatrician	100	88.9	11.1	40	60	33	66.7	42.9	57.1
Neonatologist	100	0	100	0	0	0	0	0	0
Anesthesiologist	100	100	0	0	100	0	0	50	50
Nurse Anesthetist	100	83.3	16.7	100	0	83.3	16.7	100	0
Nurse midwife	100	94.4	5.6	100	0	100	0	100	0
Nurse	100	100	0	100	0	100	0	100	0
Physician Assistant	100	83.3	16.7	100	0	100	0	100	0

Midwife/CM/RM	100	100	0	100	0	100	0	100	0
Laboratory technician	100	100	0	100	0	100	0	100	0
Laboratory Assistant	100	100	0	100	0	100	0	100	0
Laboratory Aide	100	100	0	100	0	100	0	100	0

**Table 19: Percentage of Health Centers/Clinics with health workers present on site and on call Monday through Friday and Weekends/holidays day and night**

Health Center/Clinic (88)	Percentage of facilities with cadres present	Mon-Fri Daytime		Mon-Fri night		Sat-Sun/holidays daytime <sup>1</sup>		Sat-Sun/holidays night <sup>1</sup>	
		On-duty	On-call	On-duty	On-call	On-duty	On-call	On-duty	On-call
Obstetrician/Gynecologist	1.1	100	0	0	100	0	0	0	0
Medical doctor (general practitioner)	5.7	80	20	50	50	0	100	0	100
General surgeon	0	0	0	0	0	0	0	0	0
Pediatrician	0	0	0	0	0	0	0	0	0
Neonatologist	0	0	0	0	0	0	0	0	0
Anesthesiologist	0	0	0	0	0	0	0	0	0
Nurse Anesthetist	2.3	50	50	0	100	100	0	0	100
Nurse midwife	0	0	0	0	0	0	0	0	0
Nurse	26.1	100	0	100	0	100	0	90.9	9.1
Physician Assistant	15.9	100	0	90.9	9.1	90.9	9.1	88.8	11.1
Midwife/CM/RM	22.7	100	0	100	0	100	0	100	0
Laboratory technician	11.4	100	0	100	0	100	0	100	0
Laboratory Assistant	20.5	100	0	81.8	18.8	100	0	100	0
Laboratory Aide	15.9	100	0	100	0	100	0	100	0

### 6.3 Ratio of midwives to 1,000 Institutional Deliveries and 10,000 population

Liberia is one of the countries with high ratio of maternal mortality (742 per 1000000 livebirth) globally. The availability of midwife 24/7 in EmONC facility is key to mitigating the high maternal death. The WHO has set a benchmark of 6 midwife per 1000 birth assuming that a midwife can attend an average of 175 births during a typical year. Table 20 below shows the number of midwives for every 1,000 institutional deliveries in each county. These figures were calculated using the number of institutional deliveries conducted at a facility within the 12-month reference period.

Nationally, the number of midwives per 1,000 institutional deliveries was 8, which is 2 more than the international benchmark of 6 per 1000 birth. Ten counties out of 15 met the this standard ranging from 6-17 midwives per 1000 birth. The lowest ratio of midwives per 1,000 deliveries was reported from Bong (5), Grand Cape Mount (3), Nimba (3), Sinoe (5) and Grand Bassa (3) with per 1,000 deliveries.

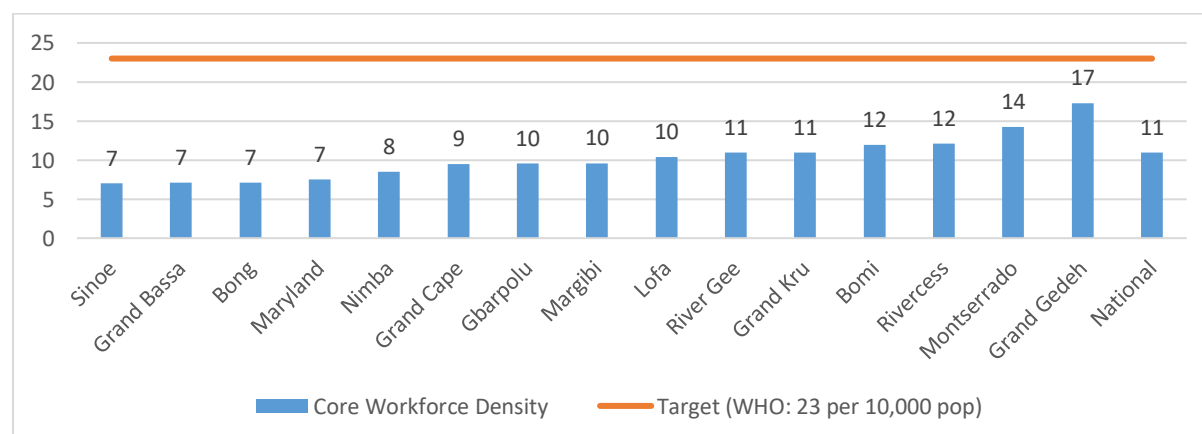
Table 20: Number of midwives per 1,000 institutional deliveries and per 10,000 population and number of physicians, midwives and nurses per 10,000 population by County

	Population	Number of deliveries in facilities	Number of midwives in facilities	Number of midwives per 1,000 institutional deliveries 2	Number of midwives per 10,000 population2	Number of physicians, midwives, nurses and PAs in all facilities	Number of physicians, midwives, nurses and PAs per 10,000 population 2
<b>National</b>	<b>4,365,697</b>	113,778	<b>914</b>	<b>8</b>	<b>2.1</b>	<b>4750</b>	<b>11</b>
<b>County</b>							
Bomi	105,631	1990	24	12	2	126	12
Bong	418,764	16763	84	5	2	297	7
Gbarpolu	104,713	2155	32	15	3	100	10
Grand Bassa	278,388	6607	23	3	1	197	7
Grand Cape	159,574	5839	20	3	1	151	9
Grand Gedeh	157,291	5563	87	16	6	272	17
Grand Kru	72,723	1723	16	9	2	80	11
Lofa	347,666	12508	89	7	3	361	10
Margibi	263,608	5483	44	8	2	253	10
Maryland	170,702	3671	40	11	2	128	7
Montserrado	1,404,214	18113	311	17	2	2003	14
Nimba	580,182	24686	68	3	1	491	8
Rivercess	89,796	2264	29	13	3	109	12
River Gee	83,869	2383	28	12	3	92	11
Sinoe	128,576	4030	19	5	1	90	7

Source: DHIS 2020/MOH HR

Based on the WHO's guidelines for monitoring the health systems building blocks, the number of health workers per 10,000 population by cadre is the health workforce indicator that is most commonly reported internationally and helps to understand the workforce distribution of a country. Figure 7 below shows, the ratio of midwives, physicians, physician assistant and nurses combined, per 10,000 population. The international benchmark for the combined cadre is 23 per 10,000 population. The number of physicians, midwives, physician assistant and nurses per 10,000 population was not met anywhere in the country. The national combined figure was 11, with the highest ratio in Grand Gedeh and the lowest from Sinoe.

Figure 7: Core Health Workers Density per 10,000 population per county



## **CHAPTER 7: AVAILABILITY OF DRUGS, EQUIPMENT AND SUPPLIES**

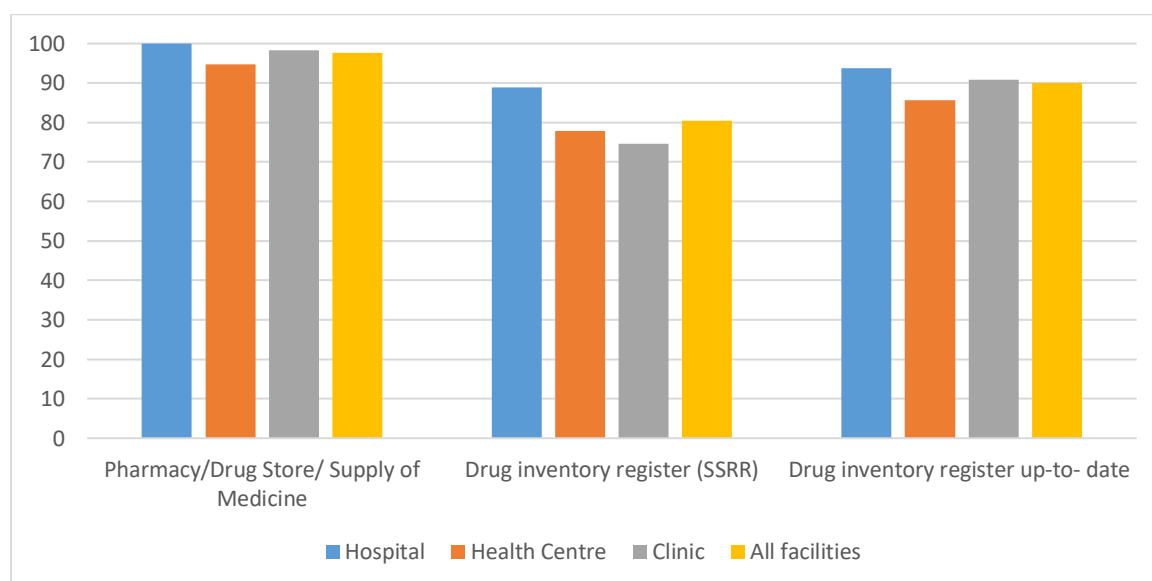
## Chapter Seven Availability of Drugs, Equipment and Supplies

### 7.1 Management and Stockout of Drugs

As shown in Annex A: Table 8 and Figure 8 below, a greater proportion of the facilities had a pharmacy or supply of medicines. In general, 80 % of the facilities had a drug inventory register. Of these, 90% had the register up-to-date. Majority of the hospitals 89 percent had a drug inventory register and 94 were up-to-date. Seventy-eight percent (78%) of health centers and 75% of clinics had a register; while over 86% of health centers and 91% clinics had a register up-to-date.

Annex A: Table 8 also describes the source of medicines, gloves, syringes and medical & infection prevention supplies from a large majority of the facilities. About 90% of all facilities mentioned government as the major source of medicine supplies. A similar proportion of the facilities reported the government as the primary source of gloves, syringes, medical & infection prevention supplies. For medicines, very few of the facilities cited private pharmacy (10.6%), and NGO/mission organizations (12.5%) as a primary source. Except hospitals which were mostly private and cited private facilities or NGOs/mission, the rest of the facilities received medicines, gloves, syringes and supplies from government suppliers.

*Figure 8: Percentage of facilities with a supply of medicines with registers and sources of drugs and supplies, by type of facility*



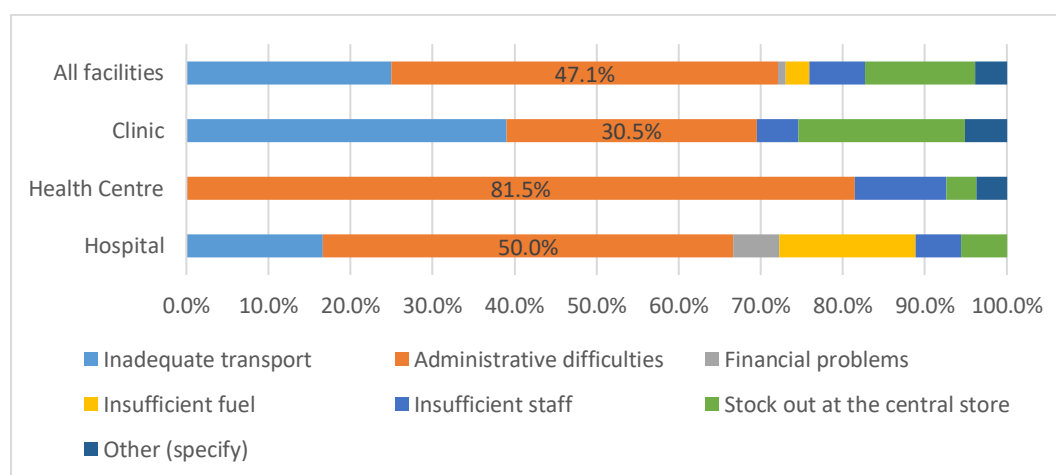
#### When Drug are Ordered

Annex A: Table 9 reveals variations in ordering schedules for medicines in the pharmacy or drugstore. In the pharmacy, 86% of the facilities ordered drugs and supplies each week/month/quarter of the year while 16% ordered whenever stock reached a reorder level. Also, about 12% ordered when facility ran out of drug while 1.9% said they Never order drugs (shipments come/kits arrive).

## Common causes of delays in delivery of supplies

Figure 9 below shows that the most common cause of delay in the supply of medicines was stock-out due to administrative difficulties (47.1%), followed by inadequate transport (25.0%) and stockout at central store. Similarly in hospitals were administrative difficulties (50%) and Insufficient fuel (16.7%). Administrative difficulties was the most common cause of delays mentioned by health centers while inadequate transport was the most common across clinics.

*Figure 9: : Percentage distribution of facilities with a pharmacy or supply of medicines that reported most common causes of delays in delivery of medicines and supplies by facility type*



## Access to pharmacies and pharmacy-related items

Table 21 below elaborate on access to pharmacies and pharmacy related items. Among all facilities with a pharmacy or supply of medicines, 48.% of them had their pharmacies accessible 24 hours a day and seven days a week (24/7). All hospitals had a 24/7 accessible pharmacies, while only 59.3% and 27% of health centers and clinics had a 24/7 accessible pharmacies respectively. A greater proportion (97%) of all hospitals, health centers and clinics used a “first-expired-first-out” drug supply management system.

Similarly, about 99% have mechanism in place to ensure expired drugs are not distributed. Again 90% of all facilities drugs are protected from moisture, heat, or infestation (e.g., placed on shelves) with health centers recording lowest at 77%. Moreover, a greater percent of 91.3 facilities indicated that required drugs are refrigerated.

In general, 91.3 percent all facilities that reported they refrigerated required drugs, only 82.7 percent had an electric or gas-powered refrigerator and 69.2 percent had a solar-powered refrigerator. Solar-powered refrigerators were more common among clinics and health centers than the hospitals.

*Table 21: Percentage of facilities reporting on pharmacy-related items, by type of facility (among facilities with a pharmacy/supply of drugs)*

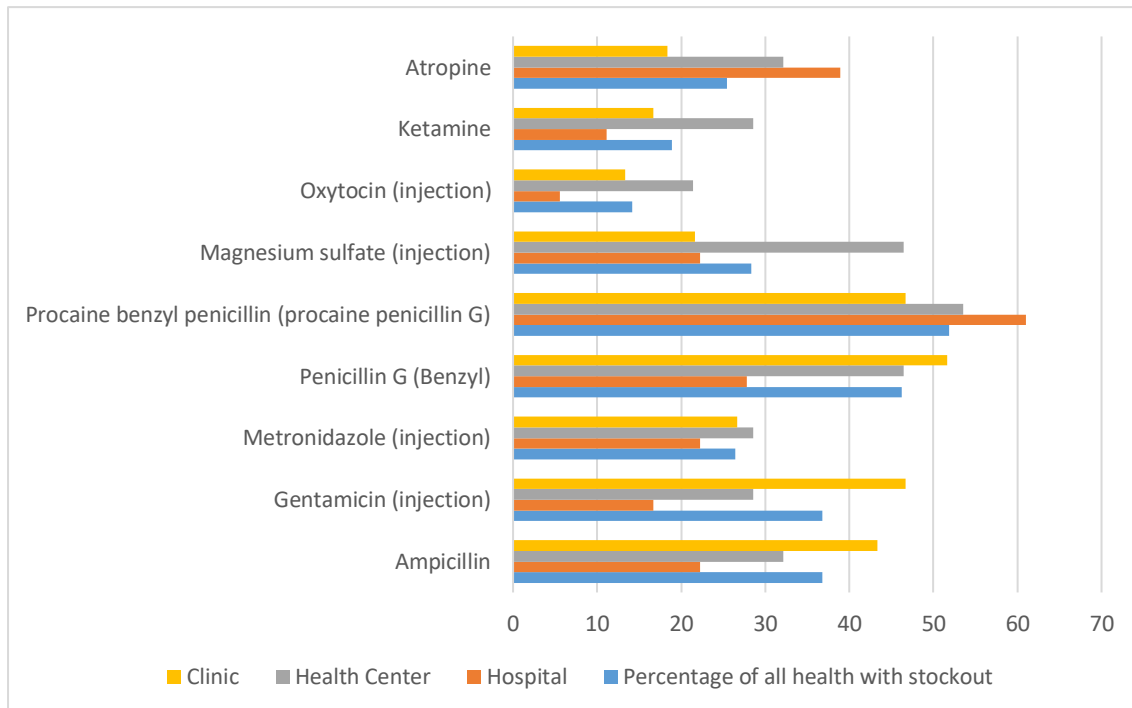
	Type of health facility			
	All facilities	Hospital	Health Centre	Clinic
	%	%	%	%
Pharmacy/Drug storage accessible 24/7	48.1	100.0	59.3	27.1
First-Expired-First-out system in use	97.1	94.4	96.3	98.3
Mechanism in place to ensure expired drugs are not distributed	99.0	94.4	100.0	100.0
Drugs are protected from moisture, heat, or infestation (e.g., placed on shelves)	90.4	94.4	77.8	94.9
Required drugs are refrigerated	91.3	94.4	88.9	91.5
<b>Power source of main refrigerator storing drugs: Among facilities storing required drugs in functioning refrigerator</b>				
Facility has at least 1 functioning electric / gas refrigerator	82.7	94.4	63.0	88.1
Facility has at least 1 functioning solar refrigerator	69.2	22.2	66.7	84.7

### **Stock-out of some essential drugs**

Addressing stockout within the Liberia health system remains a major challenge. Figure 10 below shows the level of stockout among selected essential drugs namely antibiotics, magnesium sulphate, oxytocin, ketamine, and atropine – in the last 3 months prior to the assessment. Figure 10 shows antibiotics to be the most out of stock essential drugs experienced within health facilities. Stockout of antibiotics range from metronidazole (26%), Ampicillin (37%), Gentamicin injection (37%), Penicillin (46%) and Procaine benzyl penicillin (52%).

Hospital recorded highest percentage of stock-out for two antibiotics; procaine (61%) and atropine(39%). Similarly, drug with the highest stockout in clinics were: Penicillin (52%), Gentamicin (47%) and Ampicillin (43%). Also highest stockout among health centers were: Ketamine, Oxytocin, Magnesium sulfate and Metronidazole. Among other essential drugs, the least stockout were oxytocin (14%), ketamine (19%) and atropine (25%).

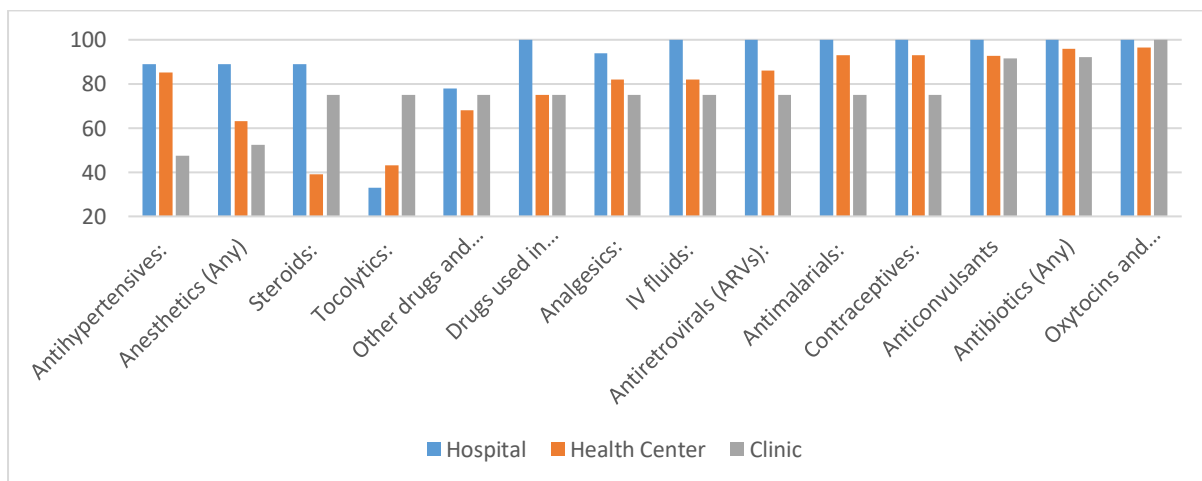
**Figure 10: Percentage of facilities with a pharmacy or supply of medicines that reported stock-out of some essential drugs in 3 months before the survey by facility type**



## 7.2 Availability of Essential Drugs

**Table 10-21 in Annex A, Figure 11 and 12** below present the availability of drugs used for EmONC signal functions and other MNH services in health facilities. Among all essential drugs, Oxytocins and prostaglandins, Anticonvulsants, Antibiotics (Any), Antiretrovirals (ARVs), Antimalarials and Analgesics were the most common essential drug across health facility type. Over 90% of all hospitals and 75% of all health centers and clinics had one or more essential drugs of various kind. Steroids (43%) and Tocolytics (29%) were the least essential medicine in stock.

**Figure 11: Percentage of facilities with One or More Essential by facility type**





**Antibiotics (Annex A: table 10):** Ninety-four percent (94) of facilities had one or more antibiotics related to EmONC signal functions and emergencies. All hospitals, 96% health centers and 92% clinic has one or more antibiotics. Among the antibiotics, Cephazoline sodium (5%), Cefotaxime injection (10%) and Oral flucloxacillin (12%) were the least compared to others. This trend was similar for all facility type especially hospitals. Similarly, Ampicillin (63%) and Metronidazole (injection)-80% were the highest among all facility type.

**Anticonvulsants (Annex A: table 11):** : Ninety-three percent of the facilities (all hospitals, health centers and clinics) had one or more anticonvulsants. Diazepam – injection (83.5 percent), and magnesium sulfate- injection (77.3 percent) were the three most commonly available anticonvulsants in all facilities.

**Antihypertensives (Annex A: table 12):** Thirty-five percent of the facilities (all hospitals, health centers and clinics) stocked one or more antihypertensives. Methyldopa (68.7 percent) and nifedipine (34.3 percent) were widely available, while labetalol (10.4 percent) was the least available antihypertensive in all facilities.

**Oxytocics and prostaglandins (Annex A: table 13) :** Ninety-eight percent of the facilities (all hospitals, health centers and clinics) had one or more oxytocics. Oxytocin (99.0 percent), and misoprostol (61.8 percent) were widely available in all facilities. Prostaglandin was the least available (4.9 percent) of the facilities stocked it.

**Drugs used in emergencies (Annex A: table 14) :** Seventy-Nine percent of the facilities (all hospitals, health centers and clinics) had one or more drugs used in emergencies. The most commonly stocked drugs were Hydrocortisone (71.4 percent) and calcium gluconate (60.7 percent) in all facilities, respectively. Nitroglycerine (2.4 percent), and ephedrine (3.6 percent) were the least available drugs in all facilities.

**Anesthetics (Annex A: table 15):** Sixty-One percent of the facilities (all hospitals, health centers and clinics) had one or more drugs used in Anesthetics. The most commonly stocked drug was Lignocaine/Lidocaine 2 or 1 (90%) while Halothane (14%) was the least available drugs in all facilities.

**Analgesics (Annex A: table 16):** Seventy-Three percent of the facilities (all hospitals, health centers and clinics) had one or more drugs used in Analgesics. The most commonly stocked drug was Paracetamol (85%) while the least were Pethidine (10%), Indomethacin (20%) and Morphine (20%).

**Tocolytics (Annex A: table 17):** Twenty-Nine percent of the facilities (all hospitals, health centers and clinics) had one or more drugs used in Tocolytics. The most commonly stocked drug was Salbutamol (67%).

**Steroids (Annex A: table 18):** Forty-Three percent of the facilities (all hospitals, health centers and clinics) had one or more drugs used in Steroids. The most commonly stocked drug was Dexamethasone (95%) while the least were Betamethasone (10%) and Prednisolone corticosteroid (13%),

**IV Fluids (Annex A: table 19):** Eighty-Seven percent of the facilities (all hospitals, health centers and clinics) had one or more drugs used in IV Fluids. The most commonly stocked drug

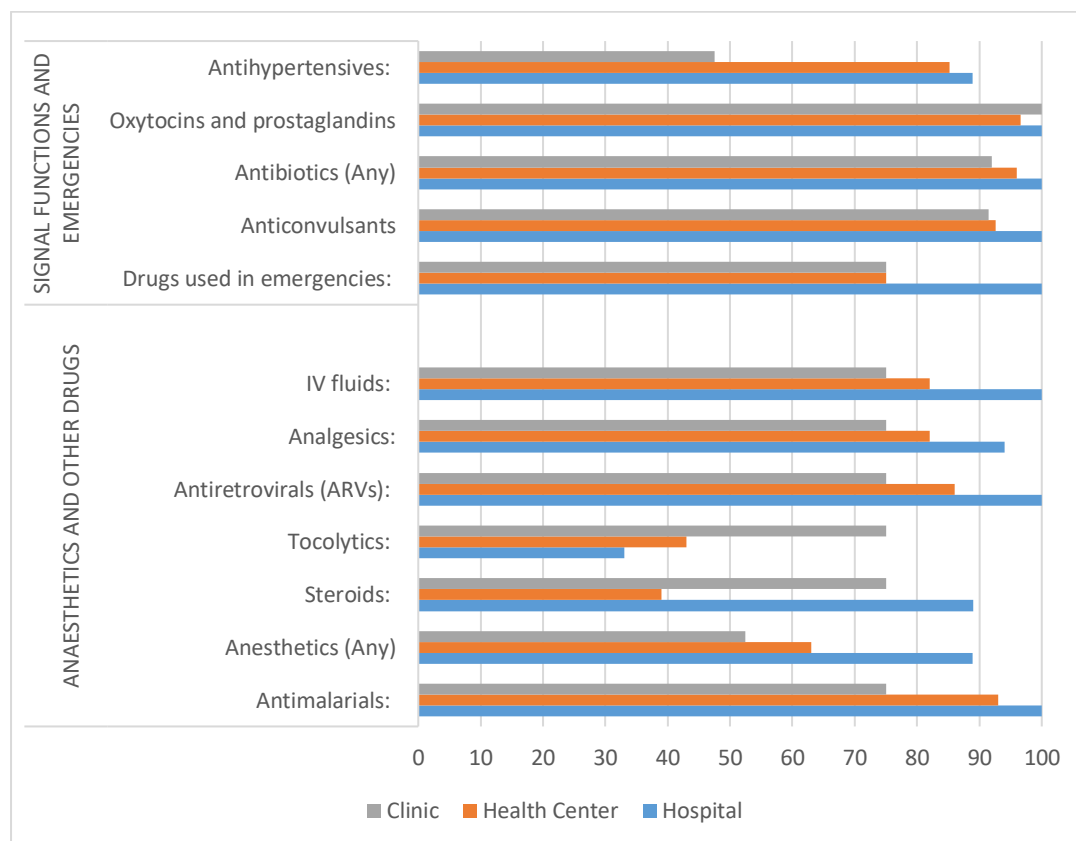
were Ringers lactate (91%) and Dextrose (73%), while the least were Dextran (14%) and Glucose 10 (14%) respectively.

**Antimalarials (Annex A: table 20):** Ninety-Four percent of the facilities (all hospitals, health centers and clinics) had one or more drugs used in Antimalarials. Over 90% of all facilities had stock of all antimalarials except for Quinine Dihydrochloride (70%).

**Antiretrovirals (Annex A: table 21):** Eighty-One percent of the facilities (all hospitals, health centers and clinics) had one or more drugs used in Antiretrovirals. The most commonly stocked drug were Combined ARVs for mother (89%) and Nevirapine (for newborn)-60% while the least was Post-HIV exposure prophylactic treatment (38%).

**Contraceptives (Annex A: table 22):** Ninety-four percent of the facilities (all hospitals, health centers and clinics) had one or more drugs used in Contraceptives. The most commonly stocked drug were 3-month injectables (Depo and Sayana press)-97%, Male condoms (95%), Implants (93%), Combined oral contraceptives (89%) and Cycle Beads (86%), while the least was Emergency Contraception (16%).

Figure 12: Percent of facilities that had drugs related to the signal functions and emergencies, and Anesthetics and other drugs



**Table 22 below** presents the percentage of facilities stocking other drugs. Most of the facilities had Tetanus toxoid vaccine (88%), insecticide-treated bed nets (84.6 percent), Folic acid (66%), Mebendazole (63%) and Ferrous sulfate or fumarate (56%). The least stocked drugs in this category were anti RhO (D) immunoglobulin (3.8%), sodium citrate (3.8 percent) and heparin (5.8 percent). Vitamin K (for newborns) and Nystatin stocked in only 23.1 and 21 percent of facilities.

*Table 22: Percentage of facilities reporting on availability of Contraceptives and other drugs and supply, by type of facility (among facilities with pharmacy/supply of drugs)*

	Hospital	Health Centre	Clinic	All facilities
	%	%	%	%
<b>OTHER DRUGS AND SUPPLIES</b>	78	68	75	74
Vitamin K (for newborn)	44.4	18.5	18.6	23.1
Nystatin (oral) (for newborn)	22.2	33.3	15.3	21.2
Oral rehydration solution	72.2	37	23.7	35.6
Gentian violet paint	22.2	37	15.3	22.1
Ferrous sulfate or fumarate	72.2	55.6	52.5	56.7
Folic acid	100	55.6	61	66.3
Heparin	27.8	0	1.7	5.8
Magnesium trisilicate (MTS)	50	25.9	15.3	24
Sodium citrate	0	7.4	3.4	3.8
Anti-tetanus serum	11.1	37	20.3	23.1
Tetanus toxoid vaccine	94.4	85.2	88.1	88.5
Anti-Rho (D) immune globulin*	0	3.7	5.1	3.8
Insecticide-treated bed nets (ITN)	94.4	92.6	78	84.6
Mebendazole	72.2	66.7	59.3	63.5

### 7.3 Availability of Materials, Equipment, Supplies and Guidelines for Labor and Delivery

#### Materials for infection prevention

Table 23 below shows the availability of materials for infection prevention in the labor and delivery ward. The common materials for infection prevention across facilities were Regular trash bin (95%), Puncture-proof sharps container (93%), Prepared disinfection solution (86%) and Non-sterile protective clothing (86%). The least available infection prevention material was a mayo stand to establish a sterile field (20%). Also, chlorhexidine was the most widely available disinfectant, found in 72.6% of facilities, while Ethanol (23%) was the least availability Disinfectants and antiseptics.

*Table 23: Percentage of facilities with the indicated materials for infection prevention in the maternity area (Basic), by type of facility*

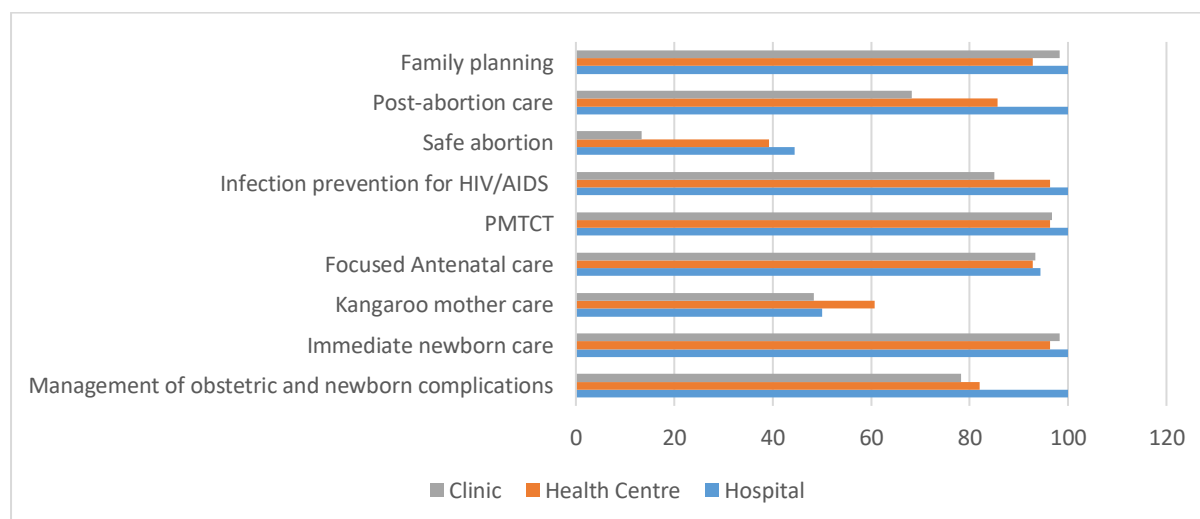
Basic Items	Hospital	Health Centre	Clinic	Total
	(%)	(%)	(%)	(%)
Soap	77.8	75.0	66.7	70.8
Antiseptics	61.1	75.0	66.7	67.9
Examination Gloves	72.2	64.3	75.0	71.7
OBGYN gloves	38.9	53.6	51.7	50.0

Heavy duty gloves	55.6	64.3	71.7	67.0
Non-sterile protective clothing	88.9	85.7	86.7	86.8
Decontamination container	83.3	89.3	78.3	82.1
Bleach or bleaching powder	66.7	75.0	70.0	70.8
Prepared disinfection solution	83.3	82.1	90.0	86.8
Regular trash bin	88.9	100.0	95.0	95.3
Covered contaminated waste trash bin	88.9	89.3	80.0	84.0
Puncture-proof sharps container	94.4	89.3	95.0	93.4
Mayo stand (or equivalent to establish sterile field)	50.0	28.6	8.3	20.8
<b>Disinfectants and antiseptics</b>				
Chlorhexidine	88.9	67.9	70.0	72.6
Ethanol	44.4	21.4	18.3	23.6
Polyvidone iodine	61.1	46.4	51.7	51.9

## Guidelines and protocols

As shown in Figure 13, over 90 percent of facilities have immediate newborn care, focused antenatal care, HIV PMTCT and family planning guidelines and protocols. Eighty-three percent had guidelines for management of obstetric and newborn complications. The least available guidelines were Safe Abortion (25%) and Kangaroo Mother Care (51%) respectively. Except for Safe Abortion and Kangaroo mother care, over 94% of all hospitals had all other guidelines and protocols.

*Figure 13: Percentage of facilities with indicated guidelines in the maternity ward, by type of facility*



## Basic diagnostic, resuscitation equipment and supplies for other procedures in the maternity area

Table 22 and 23 in Annex A and Table 24 below present the availability of Basic diagnostic, resuscitation equipment and supplies for other procedures in the maternity area. In table 22 and 23 in the annex, Partograph (92%), IV Infusion stand (93%), Scissors (94%), Measuring tape (95%), Beds (97%) and Examination table (98%) were the most common equipment and

supplies in Maternity area. Also, the least of these equipment and supplies were IV fluid (neonatal giving) set/umbilical catheter (11%), Rectal thermometer for newborn (15%), Apnea monitor (6.6%), Filled oxygen cylinder with cylinder carrier and key to open valve (14%), Oxygen cylinder regulator (16%), Ultrasound (16%), Surgeon's hand brush with nylon bristles (1&%) and Oxygen Concentrator (19%).

### Supplies and equipment for newborns

Table 24 and 25 below show availability of supplies and newborn resuscitation equipment needed for newborn care. It is paramount that instant newborn care be provided to newborns in all settings as part of essential newborn care. These include warming, drying, stimulation, hygiene and thermal care. These are the first and immediate steps in neonatal resuscitation and these interventions require availability of adequate functional equipment and supplies for newborn care. Newborn weighing scale and New born resuscitation tables were available in almost all health facilities at 87% and 84% respectively. The least available equipment/supplies were Ictrometer (use for measuring the yellowness of the skin in newborn) found only in 3.8% of facilities, and fluorescent tubes for phototherapy to treat jaundice in 4.7% of facilities. These least among all facility types as well.

The **neonatal resuscitation pack** consists of essential basic equipment to ensure adequate resuscitation of the newborn: In Table 25 below, Ambu (ventilatory) bag (86%), Mucus extractor (84%) and Infant face masks, sizes 0, 1, 2 (74%) were the most common Neonatal resuscitation pack available. The least available equipment for newborns were Endotracheal tubes, 3.5, 3.0 and Disposable uncuffed tracheal tubes, sizes 2.0 to 3.5 found in 12.3 percent of facilities.

*Table 24: Percentage of facilities with basic and emergency newborn supplies and equipment in the maternity area, by type of facility*

	Hospital	Health Centre	Clinic	All facilities
<b>Supplies and equipment needed for newborn</b>				
Baby weighing scale	94.4	85.7	86.7	87.7
Newborn resuscitation table	88.9	71.4	88.3	84
Incubator	50	7.1	3.3	12.3
Radiant warmer	38.9	7.1	3.3	10.4
Ictrometer (use for measuring the yellowness of the skin in newborn)	16.7	3.6	0	3.8
Fluorescent tubes for phototherapy to treat jaundice	27.8	0	0	4.7
Small cup for breast milk expression	55.6	21.4	25	29.2
Towels or cloth for newborn	50	42.9	61.7	54.7

*Table 25: Percentage of facilities with basic and emergency newborn supplies and equipment in the maternity area, by type of facility: Continue*

	Hospital	Health Centre	Clinic	All facilities
<b>Neonatal resuscitation pack</b>				
Mucus extractor	100	89.3	76.7	84
Infant face masks, sizes 0, 1, 2	94.4	82.1	65	74.5
Ambu (ventilatory) bag	94.4	85.7	85	86.8
Suction catheter, 10, 12 Ch	77.8	57.1	33.3	47.2

Infant laryngoscope with spare bulb and batteries	55.6	14.3	0	13.2
Endotracheal tubes, 3.5, 3.0	55.6	10.7	0	12.3
Disposable uncuffed tracheal tubes, sizes 2.0 to 3.5	50	14.3	0	12.3
Suction aspirator (operated by foot or electrically)	77.8	25	5	22.6
Mucus trap for suction	66.7	25	18.3	28.3

Table 26 below shows that the most widely available equipment in Episiotomy/perineal/vaginal/cervical repair pack in the maternity or labor and delivery wards were Vaginal speculum-Sims (75%) and Vaginal speculum-Cusco (66%) and the least available were Dissecting forceps, toothed (48%) and suture (44%). Over 66% of all hospitals assessed had these equipment available in the maternity or labor and delivery wards.

Among the equipment used for assisted vaginal delivery (Table 26 below), the vacuum extractor with different size cups was widely available in 27.4% of the facilities, but was the most common in 61.1 percent of hospitals. The least available equipment was obstetric forceps outlet, available only in 20.8% of facilities.

Table 27 below presents the availability of equipment used for uterine evacuation. Vaginal speculum (Sims), and Sponge (ring) forceps were the most widely available uterine equipment used for uterine evacuation in over 50% of all facilities. Also, in hospitals, the vaginal speculum (Sims), sponge (ring) forceps, dissecting forceps (serrated jaws 250mm s/s), Uterine dilators, sizes 13-27, Sharp uterine curettes, size 0 or 00, Blunt uterine curettes, size 0 or 00, and uterine sound were the most available uterine equipment in more than 83% of hospitals.

Among the equipment for MVA (removal of retained products of conception), vacuum aspirators or syringes were the most widely available found in 68.9% of the facilities, while the least available MVA were the other oil (for lubricating O-ring) found in 34.9% of facilities.

*Table 26: Percentage of facilities with items for cervical/perineal repair pack and equipment for other procedures in the maternity area, by type of facility*

Episiotomy/perineal/vaginal/cervical repair pack	Hospital %	Health Centre %	Clinic %	All facilities %
Sponge (ring) forceps	77.8	53.6	45.0	52.8
Artery forceps large/small	66.7	53.6	46.7	51.9
Needle holder	77.8	64.3	73.3	71.7
Sutures	66.7	42.9	38.3	44.3
Stitch scissors	72.2	57.1	55.0	58.5
Dissecting forceps, toothed	77.8	53.6	36.7	48.1
Vaginal speculum, Sims	88.9	67.9	75.0	75.5
Vaginal speculum, Cusco	88.9	60.7	61.7	66.0
<b>Vacuum extraction/ forceps delivery</b>				
Vacuum extractor with different size cups	61.1	35.7	13.3	27.4
Obstetric forceps, outlet	44.4	28.6	10.0	20.8
Obstetric forceps, mid-cavity	66.7	25.0	10.0	23.6
Obstetric forceps, breech	55.6	28.6	10.0	22.6

*Table 27: Percentage of facilities with items for cervical/perineal repair pack and equipment for other procedures in the maternity area, by type of facility*

	Hospital	Health Centre	Clinic	All facilities
	%	%	%	%
<b>Uterine evacuation</b>				
Vaginal speculum, (Sims)	88.9	71.4	40.0	56.6
Sponge (ring) forceps	88.9	60.7	41.7	54.7
Dissecting forceps, serrated jaws 250mm S/S	83.3	46.4	20.0	37.7
Towel clip	61.1	35.7	10.0	25.5
Ovum forceps, 240mm, S/S	66.7	25.0	11.7	24.5
Uterine forceps, 3x4 teeth, curved, S/S	72.2	32.1	15.0	29.2
Uterine forceps, 241mm, S/S	77.8	32.1	13.3	29.2
Uterine dilators, sizes 13-27	88.9	42.9	16.7	35.8
Sharp uterine curettes, size 0 or 00	83.3	35.7	13.3	31.1
Blunt uterine curettes, size 0 or 00	83.3	39.3	15.0	33.0
Uterine sound	83.3	42.9	30.0	42.5
<b>Manual vacuum aspiration</b>				
Vacuum aspirators/syringes	83.3	75.0	61.7	68.9
Silicone lubricant (for lubricating O-ring)	66.7	67.9	36.7	50.0
Other oil (for lubricating O-ring)	44.4	50.0	25.0	34.9
Flexible cannulae, 4-6mm	88.9	60.7	46.7	57.5
Flexible cannulae, 7-12mm	83.3	60.7	48.3	57.5

Table 28 and 29 below describes the percentage of facilities that had separate equipment in each category and delivery set/pack, a dressing instrument set and gynecological equipment.

Table 28 reveals that Cord ties, cord-cutting scissors, and Straight stitch scissors, 135mm were the most widely available supplies and equipment in the delivery set, found in over 80% of the facilities. Among the dressing instrument sets, Needle holder, 180mm, S/S , Scissors, sharp, straight (120mm, S/S) and Scissors, flat, curved (180mm, S/S) , were the most available equipment in over 55% of the facilities. When disaggregated by facility type, dressing instruments were mostly available in over 66% of hospital.

In Table 29 below, 50% and more of the facilities had gynecological equipment. Among the equipment Vaginal speculum, Sims, Vaginal speculum, Cusco, adult sized and Scissors, straight, sharp 145mm S/S were the most available equipment in over 54% of facilities

**Table 28: Percentage of facilities with delivery set items and dressing instrument set items in the maternity area, by type of facility**

Delivery set/pack	Hospital (18)	Health Centre (28)	Clinic (60)	All facilities (106)
	%	%	%	%
Artery forceps, 18cm, CVD	77.8	67.9	63.3	67.0
Sponge (ring) forceps	88.9	71.4	73.3	75.5
Dissecting forceps, standard pattern, 145mm, S/S	50.0	53.6	48.3	50.0
Pean artery forceps, straight, 140mm, S/S	72.2	57.1	41.7	50.9
Cord-cutting scissors, curved, 135mm, S/S	83.3	82.1	86.7	84.9
Cord ties	100.0	92.9	95.0	95.3
Episiotomy scissors, angular, 145mm, S/S	72.2	67.9	63.3	66.0
Straight stitch scissors, 135mm	83.3	85.7	76.7	80.2
Gloves	77.8	67.9	75.0	73.6
Long gloves	55.6	53.6	53.3	53.8
Plastic sheeting	77.8	71.4	80.0	77.4
Gauze swabs	61.1	71.4	51.7	58.5
Cloth	72.2	57.1	55.0	58.5
<b>Dressing instrument set</b>				
Gallipot bowl or jar, S/S	83.3	50.0	41.7	50.9
Dissecting forceps, 1x2 teeth 140mm	83.3	46.4	35.0	46.2
Needle holder, 180mm, S/S	83.3	57.1	53.3	59.4
Scissors, sharp, straight, 120mm, S/S	66.7	60.7	50.0	55.7
Scissors, flat, curved, 180mm, S/S	72.2	53.6	51.7	55.7
Sponge (ring) forceps	83.3	53.6	45.0	53.8
Artery forceps, straight, mosquito, 130mm, S/S	77.8	50.0	35.0	46.2

**Table 29: Percentage of facilities with gynecological equipment in the maternity area, by type of facility**

Gynecological equipment	Hospital (18)	Health Centre (28)	Clinic (60)	All facilities (106)
	%	%	%	%
Vaginal speculum, Sims	77.8	71.4	48.3	59.4
Vaginal speculum, Cusco, virgin size, 75x17mm	72.2	60.7	43.3	52.8
Vaginal speculum, Cusco, adult sized	77.8	67.9	50.0	59.4
Uterine sound, graduated, 305mm, S/S	77.8	42.9	45.0	50.0
Tenaculum	72.2	57.1	43.3	51.9
Scissors, straight, sharp 145mm S/S	77.8	64.3	43.3	54.7



## 7.4 Availability of Operating Theatre Equipment

Table 24 in Annex A: presents the availability of an OT and of those that had a separate operating room for obstetric patients. Ninety-four percent of all hospitals had an OT. Of those hospitals that had an OT, only 41 percent had a separate OT room for obstetric patients.

Table 24 also reveal a list of basic items in the OT and equipment used for obstetric laparotomy and Cesarean delivery. The table reveals that all hospitals had an operating table. Ninety-four percent of hospitals had both adjustable lights shadow-less, and surgical drapes where as 76% of hospitals reported having syringes 5ml, syringes 10ml and syringes 20ml.

Similarly in Table 30 below, Suction aspirator, electric (94%), Oropharyngeal airways (88%), Anesthetic face masks (82%) and Spinal needles (18 gauge to 25 gauge)-76% were the most common in Hospitals. Also, Anesthetic vaporizers (draw-over system)-41% and Suction aspirator, foot-operated (47%).

*Table 30: Percentage of hospitals with an operating theatre (OT) and with anesthesia equipment and supplies*

	Hospitals with OT (n=17)
<b>Anesthesia Equipment</b>	
Anesthetic face masks	82.4
Oropharyngeal airways	88.2
Laryngoscopes with spare bulbs and batteries	76.5
Endotracheal tubes with cuffs, 8 mm	58.8
Endotracheal tubes with cuffs, 10 mm	58.8
Intubating forceps	58.8
Endotracheal tube connectors, plastic, 15 mm (connect directly to breathing valve; three for each tube size)	70.6
Spinal needles (18 gauge to 25 gauge)	76.5
Suction aspirator, foot-operated	47.1
Suction aspirator, electric	94.1
Anesthetic vaporizers (draw-over system)	41.2
Oxygen cylinders with manometer and flowmeter (low flow) tubes and connectors	70.6

## 7.5 Availability of Laboratory Equipment and Supplies for Blood Transfusion

Table 25 and 26 in Annex A: presents the availability of laboratories and laboratory equipment and supplies. Of all the facilities, only 63 percent had laboratories. Laboratories were more likely to be found in hospitals and health centers than in clinics (43 percent). Only 75% of the facilities with laboratories have a set of laboratory guidelines in place. Availability of laboratory guidelines was also more common among hospitals than health centers or clinics. Blood bank refrigerators, as well as blood typing and cross-matching reagents, are essential equipment and supplies for saving the lives of women who are at risk of haemorrhage.

However, a blood bank refrigerator was available in only 28% of the facilities. This equipment was mostly found in 88 percent of hospitals. Blood typing and cross-matching reagents were also found in 30% of all facilities. Among blood collection and screening tests, the HIV test was available in a large majority of the facilities (90 percent); moreover, all hospitals had HIV test available. But, just 24 to 33 percent of the facilities had hepatitis C and B tests, as well as syphilis tests (48%).

Similarly (**Table 26 Annex A**), microscope and Immersion oil were found in 94% and 80% of facilities with a laboratory, and in all hospitals and clinics. Most of the facilities had shortages of laboratory supplies. Lack of a CD 4 machine was severe among all facilities with laboratory and no clinic had CD 4. They were found in mostly hospitals accounting for only 47%. The availability of a spectrophotometer (symex, screen plus) and ammonia were also affected as only 10% and 5 % of the facilities with a laboratory had these supplies.

# **CHAPTER 8: REFERRAL SYSTEM**

## Chapter Eight: Referral System

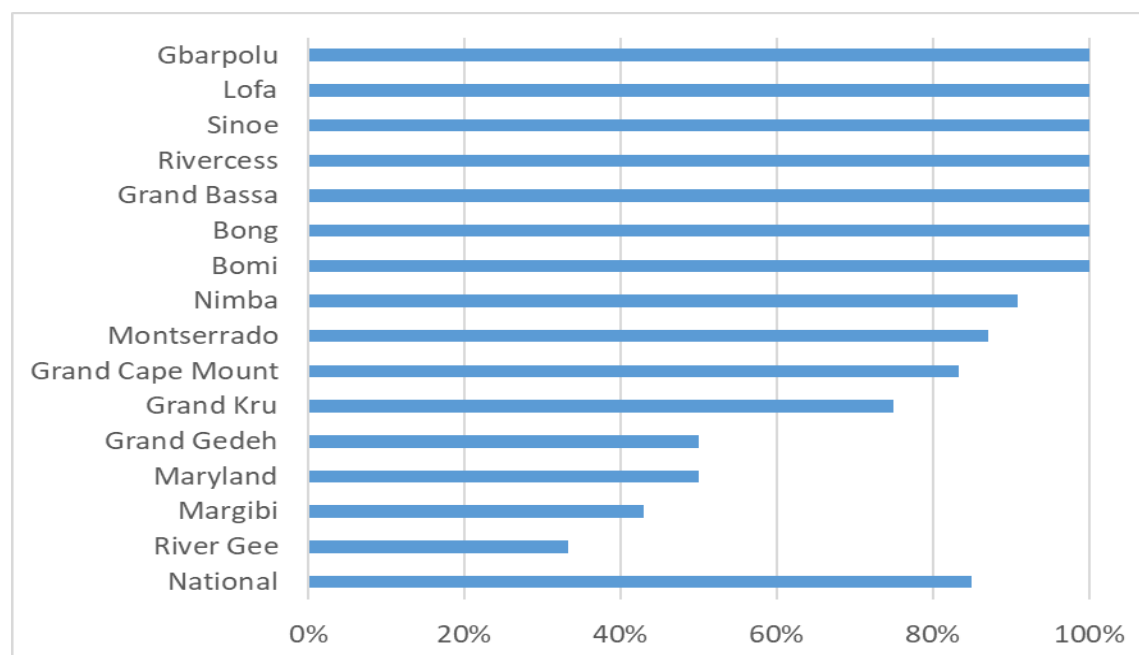
A referral system is a mechanism that enables a patient's health needs to be comprehensively managed using resources beyond those available at the location they access care from, be it in a community unit, dispensary, health centre or a higher level health facility to improve health outcomes including maternal and newborn health outcomes. Such system is characterized by an efficient use of transportation and management of resources, and quality clinical management of referred cases through evidence-based care, and adherence to practices delineated in national referral guidelines, such as using referral slips, advance calls, medical escorts, providing feedback, and documenting the process for monitoring and evaluation purposes.

Referral related questions were asked in (infrastructure and facility identification) and captured very important elements of availability of obstetric and neonatal care 24/7, transportation including availability of ambulances, distance and time to the nearest surgical facilities, and management of ambulance and vehicle maintenance. The findings provide insights about planning elements for improving quality of care across Liberia

### 8.1 Availability of Emergency Services 24/7

Facilities were asked whether they provide obstetric and neonatal care 24 hours a day and seven days a week. This is purely a self-reported response, and as shown in table 27 in the Annex A and Figure 14 below, a great majority (85%) of health facilities (hospitals, health centers and clinics affirmed the provision of emergency services 24/7. Seven of the 15 Counties had all facilities providing obstetric and neonatal care 24/7. The lowest proportion of facilities that provided the service 24/7 were reported in Margibi (43%) and River Gee (33%).

*Figure 14: Percentage of facilities with obstetric and neonatal care 24/7, by county, Liberia Rapid EmONC Assessment 2020*

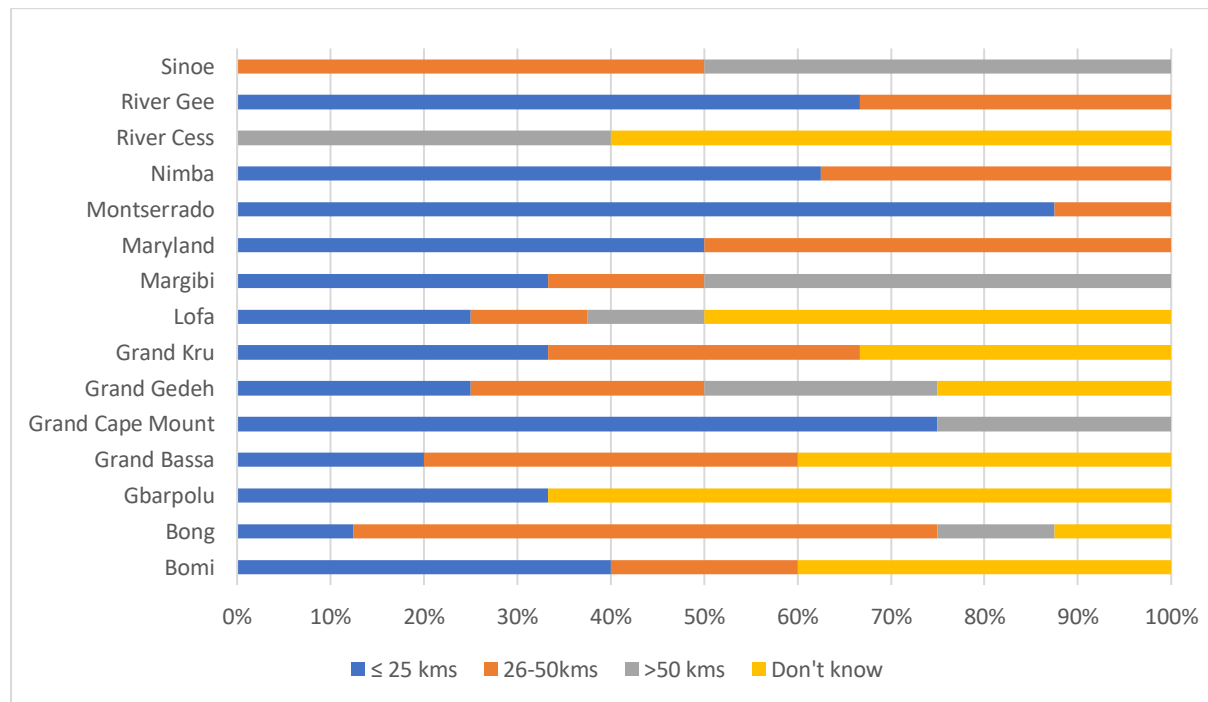


## 8.2 Distance and Time to the Nearest Facilities with Surgical Services

### Distance to the nearest surgical facilities

The distance patients must travel in order to obtain treatment has long been recognized as a primary determinant of the utilization of health care facilities. Knowing the distance and time to the next health facility including surgical facilities can aid with referrals and evidence-based planning for medical care and logistics, especially for mid- and lower-level facilities that frequently make referrals to higher-level facilities. Figure 15 below shows the distance to the nearest surgical facilities by county. Majority of the facilities assessed mentioned being less 25kms or less followed by facilities 26-50kms away from the nearest surgical facility. Fewer facilities fall in the category more than 50kms away from the nearest surgical facility.

*Figure 15: Percentage distribution of Health Centers/Clinics according to distance to the nearest facilities by County*



### 8.3 Availability of Means of Transport

According to Table 31 below, 33% of the total facilities had a functioning motor vehicle ambulance, and 7.5% per cent of them had other motor vehicles. The availability of a motor vehicle ambulance among counties varied mostly with the highest in Grand Gedeh (75 percent) and the lowest in Grand Bassa, Rivercess and Grand Capemount with 16.7% each. Table 31 also reflect that Gbarpolu has no functional mode of motorized transport available.

*Table 31: Percentage of facilities with a functional mode of transport, by facility type/sector, designation and county*

	Total Number of Facilities	Available and functional					
		Motor vehicle ambulance	Motorcycle ambulance	Bicycle ambulance	Other motor vehicle	Hammock	Others
	n	%	%	%	%	%	%
<b>National</b>	<b>106</b>	<b>33.0</b>	<b>0.0</b>	<b>0.0</b>	<b>7.5</b>	<b>3.8</b>	<b>6.6</b>
<b>County</b>							
Bomi	5	20.0	0.0	0.0	0.0	0.0	0.0
Bong	10	50.0	0.0	0.0	10.0	20.0	10.0
Grand Bassa	6	16.7	0.0	0.0	0.0	0.0	0.0
Grand Cape Mount	6	16.7	0.0	0.0	0.0	0.0	0.0
Grand Gedeh	4	75.0	0.0	0.0	0.0	0.0	0.0
Grand Kru	4	0.0	0.0	0.0	25.0	0.0	0.0
Lofa	9	44.4	0.0	0.0	0.0	0.0	0.0
Margibi	7	42.9	0.0	0.0	28.6	0.0	28.6
Maryland	4	25.0	0.0	0.0	0.0	0.0	25.0
Montserrado	23	30.4	0.0	0.0	4.3	0.0	0.0
Nimba	11	63.6	0.0	0.0	27.3	18.2	18.2
Rivercess	6	16.7	0.0	0.0	0.0	0.0	0.0
Sinoe	3	33.3	0.0	0.0	0.0	0.0	0.0
River Gee	3	0.0	0.0	0.0	0.0	0.0	33.3
Gbarpolu	5	0.0	0.0	0.0	0.0	0.0	0.0
<b>Designation</b>							
Urban	61	39.3	0.0	0.0	9.8	0.0	4.9
Rural	45	24.4	0.0	0.0	4.4	8.9	8.9
<b>Facility Type</b>							
Hospital	18	61.1	0.0	0.0	5.6	0.0	0.0
Health Centre	28	32.1	0.0	0.0	10.7	0.0	7.1
Clinic	60	25.0	0.0	0.0	6.7	6.7	8.3

**CHAPTER 9: CONCLUSION  
AND  
RECOMMENDATIONS**

## Chapter Nine: Conclusion and Recommendations

### 9.1 Conclusions

The 2020 EmONC assessment identified the gaps and progress made since the 2010 EmONC, which was the first assessment taken as a benchmark. Coverage of EmONC facilities in Liberia increased dramatically since 2010 from 24 percent to 69 percent. But the distribution of the EmONC facilities varied widely among counties with some having a serious problem in the availability of EmONC facilities. The proportion of institutional deliveries 58% based on delivery data from the DHIS2 compared to 80% as per the LDHS in 2020. As a priority, instead of stretching to upgrade every lower level facilities, it is advisable to define the national network of EmONC facilities by focusing on a targeted number of those facilities that have an important catchment area and are missing only one or two signal functions. These facilities are distributed across all counties with the highest in Montserrado (23 facilities), followed by Nimba (11 facilities), Bong (10 facilities), Lofa (9 facilities), Margibi (7 facilities), and Grand Bassa, Grand Cape mount, and Rivercess (6 facilities each).

Facility readiness to provide EmONC signal functions is one of the crucial elements of analysis useful for planning. Both hospitals and HCs/clinics show several shortages of staff except for general medical doctors (general practitioners) categories particularly among hospitals than being equipped and supplied. There were shortages observed across nurses (43), midwives (29), physician assistant (10) and lab technician (10). Of the combined total (88 clinical staff short including Lab technicians), hospitals account for 68% compared to primary facilities.

Though there were several drugs available at health facilities, Liberia is still constrain with ensuring the availability of the most needed essential drug. Maternal and newborn care services are highly dependent on the availability of qualified and skilled health workers. This assessment shows severe shortages of all categories of health workers, except surprisingly, obstetrician/gynecologists and general surgeons. Finally, the availability of health facility utilities such as communication, water, electricity and transportation is key for Maternal and newborn care services. There is increase in the availability of water but there is still gaps when considering communication and electricity in facilities as well as transport for referral.



## 9.2 Recommendations

Recommendations were crafted based on the gaps identified in this assessment and associated sources. In addition, the country core team reviewed the feasibility of these recommendations to effectively respond to gaps and strategize interventions.

- Work with partner organizations and donors to prioritize resources to fill the aforementioned prioritized gaps (upgrading those facilities that miss one or two signal functions)
- Designate EmONC facilities based on the recommended EmONC targets in each county and two elements of referral networking:
  - Geo-spatial catchment population to facility proportion
  - The minimal distance and time radius (less than 25kms of reach) to the nearest surgical
- In the short term, support the existing EmONC facilities in providing good patient care with regular monitoring.
- Facilities that lack the drugs of choice mentioned above should be supplied to effectively provide parenteral antibiotics.
- Recruit and build the capacities of existing and additional midwives (both through training and deployment of additional midwives) to ensure provision of parenteral antibiotics by appropriate cadres particularly in HCs/clinics.
- Supply facilities with AVD equipment as facilities are highly likely to miss this signal function to fully function as EmONC. Boost provider's knowledge and motivation through in-service training to perform this signal function.
- Facilities that have no surgical services should be encouraged to use AVD with a proper referral system to facilitate surgery if needed.
- Equip all hospitals that lack the necessary anesthesia apparatus and oxygen cylinders to provide surgery services.
- Equip all hospitals with refrigerators, compound microscopes, blood typing and cross matching reagents to provide uninterrupted blood transfusions for those in need.
- Ensure counselling and supply of FP methods for PAC cases, as almost all facilities (94 per cent) had any of the modern contraceptives in stock.

- Train midwives and nurses in KMC as a priority and distribute of KMC guidelines as KMC is a key intervention for saving newborn lives, especially for low birth weight babies.
- Many of the facilities that lacked the afore-mentioned separate rooms/spaces may require expansion of wards or construction of additional wards/rooms. In this case, there should do an in-depth analysis of facilities requiring such rooms/spaces to develop and implement a doable plan of action. In line with this:
  - All facilities that provide delivery services should have separate ANC, labor and delivery, and PNC rooms/spaces.
  - For KMC area, either designate a space within the PNC ward as an immediate solution or establish a room/space with KMC guidelines, a table and chair.
- To improve availability of HR 24/7 and during the night and holiday shifts, the MOH should leverage resources, in collaboration with partners, to institute the following mechanisms either one by one or in combination:
  - Introduce performance-based incentives.
  - Construct living quarters;
  - Provide communication for health facilities like cell phones;
  - Enhance policy of remote area allowance;
  - Introduce staff rotation and relocation strategies to urban areas so that health workers improve their skills
  - Organize different technical and short-term trainings and professional seminars to boost knowledge;
  - Develop/strengthen the performance appraisal system to encourage staff competition and improve service delivery

## References

## Annexes

### Annex A: EmONC Tables

**Table 1:** Percentage of facilities with separate room or space for selected maternal and newborn services, by County, facility type and Area of Residence, Liberia Rapid EmONC Assessment 2020

	Health Facility	Antenatal care room	Labor room	Delivery room	Labor and delivery together	Postpartum ward	Operating theater	Neonatal care unit	Cornier for Newborn first aid/care	Kangaroo mother care area	Blood bank	Laboratory	Blood bank and laboratory together
<b>National</b>	106	94.3	46	47	60	78	26	14	63	20	10	52	15
<b>County</b>													
Bomi	5	100.0	40.0	40.0	60.0	60.0	20.0	0.0	100.0	0.0	20.0	100.0	0.0
Bong	10	100.0	60.0	60.0	40.0	90.0	20.0	30.0	50.0	10.0	0.0	40.0	20.0
Gbarpolu	5	100.0	0.0	0.0	100.0	20.0	0.0	0.0	100.0	20.0	0.0	0.0	0.0
Grand Bassa	6	100.0	16.7	16.7	83.3	66.7	16.7	0.0	100.0	16.7	0.0	16.7	33.3
Grand Cape Mount	6	100.0	33.3	33.3	66.7	66.7	33.3	16.7	33.3	16.7	0.0	16.7	16.7
Grand Gedeh	4	100.0	75.0	75.0	50.0	100.0	50.0	25.0	50.0	50.0	0.0	50.0	0.0
Grand Kru	4	100.0	25.0	25.0	75.0	50.0	25.0	0.0	0.0	25.0	0.0	50.0	0.0
Lofa	9	100.0	55.6	55.6	44.4	100.0	22.2	0.0	33.3	0.0	22.2	66.7	11.1
Margibi	7	100.0	42.9	42.9	57.1	100.0	28.6	14.3	42.9	14.3	14.3	42.9	0.0
Maryland	4	75.0	75.0	75.0	100.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Montserado	23	91.3	60.9	56.5	52.2	87.0	34.8	17.4	73.9	8.7	4.3	60.9	26.1
Nimba	11	100.0	63.6	63.6	36.4	90.9	27.3	9.1	63.6	36.4	18.2	90.9	9.1
Rivercess	6	100.0	0.0	0.0	100.0	66.7	0.0	0.0	100.0	33.3	0.0	33.3	0.0
River Gee	3	0.0	0.0	66.7	100.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sinoe	3	100.0	66.7	66.7	33.3	66.7	33.3	33.3	100.0	66.7	33.3	66.7	0.0

Health Facility Type													
Hospital	18	94	78	78	28	94	89	33	78	28	33	50	50
Health Center	28	100	71	64	43	96	29	11	61	18	11	71	14
Clinic	60	92	25	30	78	65	7	10	60	18	3	43	5
Area (Urban/Rural)													
Urban	61	95.1	55.7	55.7	54.1	85.2	39.3	16.4	67.2	19.7	16.4	59.0	21.3
Rural	45	93.3	33.3	35.6	68.9	68.9	8.9	11.1	57.8	20.0	2.2	42.2	6.7

Table 2: Percent distribution of facilities with interruption of Electricity

County	No Interruption	Interruption less than 2 days	Interruption more than 2 days
<b>National</b>	<b>67.0</b>	<b>1.9</b>	<b>24.5</b>
County			
Bomi	100.0	0.0	0.0
Bong	80.0	10.0	10.0
Gbarpolu	100.0	0.0	0.0
Grand Bassa	66.7	0.0	16.7
Grand Cape Mount	50.0	0.0	50.0
Grand Gedeh	25.0	0.0	75.0
Grand Kru	25.0	0.0	75.0
Lofa	77.8	0.0	11.1
Margibi	28.6	14.3	42.9
Maryland	50.0	0.0	25.0
Montserrado	65.2	0.0	34.8
Nimba	72.7	0.0	9.1
Rivercess	83.3	0.0	16.7
River Gee	66.7	0.0	0.0
Sinoe	100.0	0.0	0.0
Health Facility Type			
Hospital	66.7	0.0	33.3
Health Center	42.9	1.7	55.5
Clinic	78.3	7.7	14.0

Table 3: Percent distribution of facilities according to their primary source of water, by County, Facility type and Residence

Primary Source of Water							
	Number of Facility	Water (%)	Piped Water (%)	Hand Pump (%)	Well (%)	River (%)	Others (%)
<b>National</b>	<b>106</b>	<b>95</b>	<b>29.0</b>	<b>59.0</b>	<b>7.0</b>	<b>1</b>	<b>4</b>
County							
Bomi	5	100	60.0	40.0	0.0	0.0	0.0
Bong	10	90	30.0	70.0	0.0	0.0	0.0

Grand Bassa	6	100	16.7	50.0	33.3	0.0	0.0
Grand Cape Mount	6	100	33.3	50.0	0.0	0.0	16.7
Grand Gedeh	4	100	0.0	100.0	0.0	0.0	0.0
Grand Kru	4	100	25.0	75.0	0.0	0.0	0.0
Lofa	9	100	44.4	55.6	0.0	0.0	0.0
Margibi	7	100	14.3	71.4	14.3	0.0	0.0
Maryland	4	100	50.0	50.0	0.0	0.0	0.0
Montserrado	23	96	39.1	47.8	13.0	0.0	0.0
Nimba	11	100	45.5	45.5	0.0	0.0	9.1
Rivercess	6	83	0.0	66.7	0.0	16.7	16.7
Sinoe	3	100	0.0	100.0	0.0	0.0	0.0
River Gee	3	33	0.0	66.7	33.3	0.0	0.0
Gbarpolu	5	100	0.0	80.0	0.0	0.0	20.0
Designation							
<b>Urban</b>	61	97	41.0	45.9	8.2	0.0	4.9
<b>Rural</b>	45	93	13.3	77.8	4.4	2.2	2.2
Facility Type							
<b>Hospital</b>	18	100	83.3	16.7	0.0	0.0	0.0
<b>Health Centre</b>	28	100	32.1	57.1	7.1	0.0	3.6
<b>Clinic</b>	60	92	11.7	73.3	8.3	1.7	5.0

*Table 4: Percentage of facilities with functioning water source in selected maternal health service areas of the facility, by county, facility type and location*

County	Health Facility with Water Supply	No interruption water	interruption water less than 2 days	Interruption water more than 2 days
<b>Bomi</b>	5	80.0	0.0	20.0
<b>Bong</b>	9	80.0	0.0	20.0
<b>Gbarpolu</b>	5	100.0	0.0	0.0
<b>Grand Bassa</b>	6	100.0	0.0	0.0
<b>Grand Cape Mount</b>	6	83.3	16.7	0.0
<b>Grand Gedeh</b>	4	50.0	0.0	50.0
<b>Grand Kru</b>	4	100.0	0.0	0.0
<b>Lofa</b>	9	66.7	0.0	33.3
<b>Margibi</b>	7	71.4	0.0	28.6
<b>Maryland</b>	4	75.0	0.0	25.0
<b>Montserrado</b>	22	78.3	0.0	21.7
<b>Nimba</b>	11	90.9	0.0	9.1
<b>Rivercess</b>	5	50.0	0.0	50.0
<b>River Gee</b>	1	100.0	0.0	0.0
<b>Sinoe</b>	3	100.0	0.0	0.0
<b>Facility Type</b>				
<b>Hospital</b>	18	66.7	0.0	33.3
<b>Health Center</b>	28	42.9	1.7	55.5
<b>Clinic</b>	55	78.3	7.7	14.0
<b>Area of Residence</b>				
<b>Urban</b>	59	81.4	0.0	18.6
<b>Rural</b>	42	88.1	2.4	9.5

**Table 5: Percentage of facilities with a functional mode of communication, by facility type/sector, designation and County**

	On-site communication						Public telephone in vicinity	Among facilities that use individual cell phones:	
	Facilities	Land Telephone	Land Telephone elsewhere in facility	Cell phone (owned by facility)	Cell phone owned by staff	Two-way radio		Signal available in facility	Reimburse staff using their cell phones
<b>National</b>	<b>106</b>	<b>3.8</b>	<b>5.7</b>	<b>20.8</b>	<b>94.3</b>	<b>2.8</b>	<b>1.9</b>	<b>90.6</b>	<b>15.6</b>
<b>County</b>									
Bomi	5	0.0	0.0	0.0	100.0	0.0	0.0	60.0	0.0
Bong	10	0.0	0.0	10.0	90.0	0.0	10.0	90.0	0.0
Grand Bassa	6	0.0	0.0	33.3	100.0	0.0	0.0	100.0	0.0
Grand Cape Mount	6	0.0	0.0	0.0	100.0	0.0	0.0	100.0	50.0
Grand Gedeh	4	25.0	25.0	25.0	75.0	0.0	0.0	75.0	0.0
Grand Kru	4	0.0	25.0	0.0	100.0	0.0	0.0	100.0	25.0
Lofa	9	0.0	0.0	55.6	100.0	11.1	0.0	89.9	0.0
Margibi	7	0.0	0.0	28.6	100.0	0.0	0.0	85.71	0.0
Maryland	4	25.0	25.0	0.0	100.0	0.0	25.0	75.0	0.0
Montserrado	23	0.0	8.7	21.7	87.0	0.0	0.0	100.0	4.4
Nimba	11	9.1	9.1	9.1	100.0	0.0	0.0	100.0	81.8
Rivercess	6	0.0	0.0	66.7	100.0	0.0	0.0	66.7	25.0
Sinoe	3	0.0	0.0	33.3	100.0	33.3	0.0	100.0	0.0
River Gee	3	0.0	0.0	0.0	100.0	33.3	0.0	66.7	0.0
Gbarpolu	5	20.0	0.0	0.0	80.0	0.0	0.0	100.0	0.0
<b>Residence</b>									
Urban	61	4.9	6.6	18.0	90.2	3.3	1.6	90.1	12.1
Rural	45	2.2	4.4	24.4	100.0	2.2	2.2	84.4	21.1
<b>Facility Type</b>									
Hospital	18	5.6	16.7	33.3	88.9	5.6	5.6	100.0	5.6
Health Centre	28	0.0	7.1	17.9	92.9	0.0	0.0	96.4	7.4
Clinic	60	5.0	1.7	18.3	96.7	3.3	1.7	85.0	23.5

**Table 6: Percentage of facilities providing selected EmONC services, by facility type/sector, designation and county**

	Total Number of Facilities	ANC	PNC	Obstetric surgery	General anesthesia	Spinal anesthesia	Obstetric services 24H/24 and 7days/7	Neonatal services 24H/24 and 7days/7	Post Abortion Care (PAC)	Post Abortion Family Planning
<b>National</b>	<b>106</b>	<b>88.7</b>	<b>99.1</b>	<b>24.5</b>	<b>23.6</b>	<b>25.5</b>	<b>74.5</b>	<b>74.5</b>	<b>79.2</b>	<b>81.1</b>
<b>County</b>										
<b>Bomi</b>	5	100.0	100.0	20.0	20.0	20.0	80.0	80.0	80.0	100.0
<b>Bong</b>	10	100.0	100.0	20.0	20.0	20.0	80.0	80.0	70.0	80.0
<b>Grand Bassa</b>	6	100.0	100.0	16.7	16.7	16.7	100.0	100.0	100.0	100.0
<b>Grand Cape Mount</b>	6	100.0	100.0	16.7	16.7	33.3	50.0	50.0	16.7	50.0
<b>Grand Gedeh</b>	4	100.0	100.0	25.0	25.0	25.0	50.0	50.0	75.0	75.0
<b>Grand Kru</b>	4	100.0	100.0	25.0	25.0	25.0	50.0	50.0	75.0	75.0
<b>Lofa</b>	9	100.0	100.0	22.2	22.2	22.2	77.8	88.9	100.0	100.0
<b>Margibi</b>	7	85.7	100.0	14.3	28.6	28.6	57.1	100.0	85.7	71.4
<b>Maryland</b>	4	100.0	100.0	75.0	75.0	75.0	75.0	50.0	50.0	75.0
<b>Montserrado</b>	23	56.5	95.7	34.8	26.1	30.4	73.9	60.9	91.3	65.2
<b>Nimba</b>	11	90.9	100.0	27.3	27.3	27.3	81.8	81.8	63.6	90.9
<b>Rivercess</b>	6	100.0	100.0	16.7	16.7	16.7	100.0	100.0	100.0	100.0
<b>Sinoe</b>	3	100.0	100.0	33.3	33.3	33.3	100.0	100.0	100.0	100.0
<b>River Gee</b>	3	100.0	100.0	0.0	0.0	0.0	33.3	0.0	33.3	66.7
<b>Gbarpolu</b>	5	100.0	100.0	0.0	0.0	0.0	80.0	100.0	100.0	100.0
<b>Designation</b>										
<b>Urban</b>	61	80.3	98.4	37.7	37.7	39.3	77.0	75.4	88.5	78.7
<b>Rural</b>	45	100.0	100.0	6.7	4.4	6.7	71.1	73.3	66.7	84.4
<b>Facility Type</b>										
<b>Hospital</b>	18	83.3	100.0	88.9	83.3	94.4	100.0	100.0	94.4	94.4
<b>Health Centre</b>	28	85.7	96.4	17.9	21.4	21.4	75.0	71.4	92.9	78.6
<b>Clinic</b>	60	91.7	100.0	8.3	6.7	6.7	66.7	68.3	68.3	78.3

**Table 7: Percentage of facilities that provided other MNH services/signal functions in the last 3 months, by county, facility type, and location, Liberia Rapid EmONC Assessment 2020**

	Total number of Facilities	Active management of the third stage of labor? (%)	Used partograph manage labor (%)	Case of low birth weight/preterm (%)	Essential care to premature and/or low birth weight babies (%)	Antenatal corticosteroids (%)	Kangaroo Mother Care (KMC) (%)	Staff available and trained to repair fistula (%)	Trained staff to repair obstetric fistula, has at least one fistula been repaired (%)	Have you had an Abortion case over the last 3 months? (%)	Have family planning methods been provided to post abortion women (%)
<b>National</b>	<b>106</b>	<b>97.2</b>	<b>93.4</b>	<b>42.5</b>	<b>42.5</b>	<b>19.8</b>	<b>35.8</b>	<b>4.7</b>	<b>0.9</b>	<b>28.3</b>	<b>28.3</b>
<b>County</b>											
Bomi	5	100	80	40	40	20	20	0	0	20	20
Bong	10	100	100	40	40	20	50	0	0	30	30
Gbarpolu	5	100	100	20	20	0	20	0	0	0	0
Grand Bassa	6	100	100	33	33	17	33	17	0	17	17
Grand Cape Mount	6	100	100	17	17	17	17	17	17	33	33
Grand Gedeh	4	75	75	50	50	25	25	0	0	25	25
Grand Kru	4	100	100	50	50	25	0	0	0	25	25
Lofa	9	100	100	22	22	22	33	11	0	33	33
Margibi	7	100	86	71	71	43	71	0	0	71	71
Maryland	4	100	100	75	75	0	25	0	0	0	0
Montserrado	23	96	83	43	43	17	26	4	0	26	26
Nimba	11	91	100	55	55	27	64	9	0	45	45
Rivercess	6	100	100	67	67	17	67	0	0	17	17
River Gee	3	100	100	0	0	0	0	0	0	0	0
Sinoe	3	100	100	33	33	33	33	0	0	33	33
<b>Health Facility Type</b>											
Hospital	18	100	94	89	89	89	67	22	6	78	78
Health Centre	28	100	89	54	54	18	39	4	0	57	57
Clinic	60	95	95	23	23	0	25	0	0	0	0
<b>Area of Residence</b>											
Urban	61	97	89	54	54	30	41	7	0	43	43
Rural	45	98	100	27	27	7	29	2	2	9	9

**Table 8: Percentage of facilities with a supply of medicines with registers and sources of drugs and supplies, by type of facility**

Pharmacy/Drug Store/ Supply of Medicine	Facility Type			
	Hospital	Health Centre	Clinic	All facilities
Facility has a pharmacy/drug storage	100	92.9	98.3	97.2
Facility has a supply of medicines	100	96.4	98.3	98.1



<b>Primary source of medicines for facility</b>				
Government supplier	88.9	88.9	91.5	90.4
Private pharmacy	11.1	14.8	8.5	10.6
Non-governmental organization (NGO)/Mission	16.7	29.6	3.4	12.5
Other	11.1	0	0	1.9
<b>Drug inventory register</b>				
Drug inventory register (SSRR)	88.9	77.8	74.6	77.9
Drug inventory register up-to- date	93.8	85.7	90.9	90.1

*Table 9: Percentage of facilities according to mechanisms for ordering drugs, by type of facility*

<b>Among facilities with a pharmacy/Drug store</b>	<b>Health Facility Type</b>			
	Hospital	Health Centre	Clinic	Total
<b>When are drugs ordered?</b>				
Order same time each week/month/quarter	94.4	74.1	89.8	86.5
Order every 6 or 12 months	0.0	3.7	1.7	1.9
Order whenever stocks reach reorder level	0.0	25.9	16.9	16.3
Reorder when we run out	0.0	25.9	10.2	12.5
Never order drugs (shipments come/kits arrive)	0.0	0.0	3.4	1.9
Others	11.1	3.7	5.1	5.8
<b>Primary source for gloves, syringes and other medical supplies</b>				
Government supplier	88.9	85.2	91.5	89.5
Private pharmacy	16.7	14.8	8.5	11.5
NGO/Mission	11.1	33.3	6.8	14.4
Other	11.1	11.1	0.0	4.8
<b>Primary source for infection prevention supplies</b>				
Government supplier	88.9	85.2	89.8	88.5
Private pharmacy	11.1	11.1	10.2	10.6
NGO/Mission	0.0	25.9	6.8	10.6
Other	5.6	3.7	0.0	1.9

*Table 10: Percentage of facilities reporting on availability of Antibiotics, by type of facility (among facilities with pharmacy/supply of drugs)*

	Percentage of health facilities with Antibiotics	Hospital	Health Center	Clinic
<b>Antibiotics (Any)</b>	94.3	100	96	92
Amoxicillin	57	78	50	53
Ampicillin	63	89	61	57
Cephazoline sodium	5	6	4	5
Cefixime	10	22	7	8
Ceftriaxone	37	67	43	25
Cefotaxime injection (for newborn)	10	11	11	10
Chloramphenicol (injection)	43	67	39	38
Clindamycin	21	44	25	12
Cloxacillin sodium	55	56	57	53
Erythromicin	24	22	25	23
Oral flucloxacillin (for newborn)	12	6	21	10
Metronidazole (injection)	80	100	79	75
Penicillin G (Benzyl)	32	72	25	23

Procaine benzylpenicillin (procaine penicillin G)	21	39	18	17
Trimethoprim/sulfamethoxazole	54	83	50	47
Tetracycline eye ointment/drops	25	33	21	25

*Table 11: Percentage of facilities reporting on availability of Anticonvulsants, by type of facility (among facilities with pharmacy/supply of drugs)*

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Anticonvulsants</b>	<b>93.3</b>	<b>100.0</b>	<b>92.6</b>	<b>91.5</b>
Magnesium sulfate (injection) 50 concentration	77.3	94.4	72.0	74.1
Magnesium sulfate (injection) concentration other than 50	47.4	33.3	44.0	53.7
Diazepam (injection)	83.5	94.4	80.0	81.5
Phenobarbital (injection)	17.5	16.7	16.0	18.5
Phenytoin (Diphenylhydantoin)	8.2	16.7	4.0	7.4

*Table 12: Percentage of facilities reporting on availability of Oxytocin and prostaglandins, by type of facility (among facilities with pharmacy/supply of drugs)*

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Oxytocics and prostaglandins</b>	<b>98.1</b>	<b>100.0</b>	<b>96.6</b>	<b>100.0</b>
Ergometrine	28.4	29.6	19.3	55.6
Methylergometrine	21.6	14.8	19.3	38.9
Misoprostol	61.8	55.6	61.4	72.2
Oxytocin	99.0	100.0	98.2	100.0
Prostaglandin E2 (dinoprostone)	4.9	7.4	5.3	0.0

*Table 13: Percentage of facilities reporting on availability of Drugs used in emergencies, by type of facility (among facilities with pharmacy/supply of drugs)*

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Drugs used in emergencies</b>	<b>79</b>	<b>100</b>	<b>75</b>	<b>75</b>
Adrenaline (epinephrine)	28.6	44.4	23.8	24.4
Aminophylline	38.1	66.7	33.3	28.9
Atropine	11.9	33.3	4.8	6.7
Calcium gluconate	60.7	77.8	61.9	53.3
Digoxin	26.2	72.2	28.6	6.7
Diphenhydramine	8.3	16.7	9.5	4.4
Ephedrine	3.6	5.6	0.0	4.4
Furosemide	39.3	83.3	42.9	20.0
Hydrocortisone	71.4	77.8	61.9	73.3
Naloxone	7.1	16.7	0.0	6.7
Nitroglycerine	2.4	0.0	4.8	2.2
Promethazine	23.8	16.7	23.8	26.7

**Table 14: Percentage of facilities reporting on availability of Anesthetics (Any), by type of facility (among facilities with pharmacy/supply of drugs)**

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Anesthetics (Any)</b>	<b>61.5</b>	<b>88.9</b>	<b>63.0</b>	<b>52.5</b>
Halothane	14.1	31.3	17.6	3.2
Ketamine	34.4	93.8	29.4	6.5
Lignocaine/Lidocaine 2 or 1	90.6	87.5	88.2	93.5

**Table 15: Percentage of facilities reporting on availability of Anesthetics (Any), by type of facility (among facilities with pharmacy/supply of drugs)**

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Analgesics (Any)</b>	<b>73.6</b>	<b>94.4</b>	<b>82.1</b>	<b>75.0</b>
Acetylsalicylic acid	33.3	64.7	34.8	18.4
Indomethacin	17.9	17.6	13.0	21.1
Morphine	20.5	35.3	17.4	15.8
Paracetamol	85.9	94.1	82.6	84.2
Pethidine	10.3	5.9	8.7	13.2

**Table 16: Percentage of facilities reporting on availability of Tocolytics by type of facility (among facilities with pharmacy/supply of drugs)**

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Tocolytics:</b>	<b>29.2</b>	<b>33</b>	<b>43</b>	<b>75</b>
Indomethacin	45.2	50.0	41.7	46.2
Ritodrine	22.6	0.0	33.3	23.1
Salbutamol	67.7	83.3	66.7	61.5

**Table 17: Percentage of facilities reporting on availability of Steroids by type of facility (among facilities with pharmacy/supply of drugs)**

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Steroids:</b>	<b>43.4</b>	<b>89</b>	<b>39</b>	<b>75</b>
Betamethasone	10.9	18.8	9.1	5.3
Dexamethasone	95.7	100.0	100.0	89.5
Prednisone	26.1	6.3	27.3	42.1
Prednisolone corticosteriod	13.0	6.3	27.3	10.5

**Table 18: Percentage of facilities reporting on availability of IV Fluids by type of facility (among facilities with pharmacy/supply of drugs)**

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>IV Fluids</b>	87.7	100.0	82.1	75.0
Dextrose	73.1	94.4	52.2	75.0
Dextran	14.0	38.9	17.4	3.8
Glucose 5	51.6	77.8	43.5	46.2
Glucose 10	14.0	16.7	26.1	7.7
Glucose 40 or 50	39.8	44.4	52.2	32.7
Normal saline	44.1	66.7	43.5	36.5
Ringers lactate	91.4	94.4	82.6	94.2

**Table 19: Percentage of facilities reporting on availability of Antimalarials by type of facility (among facilities with pharmacy/supply of drugs)**

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Antimalarials:</b>	94.3	100	93	75
Fansidar	94.0	94.4	92.3	94.6
Artemisinin-based combination therapy (ACT)	92.0	100.0	100.0	85.7
Quinine Dihydrochloride	70.0	94.4	84.6	55.4

**Table 20: Percentage of facilities reporting on availability of Antiretrovirals (ARVs) by type of facility (among facilities with pharmacy/supply of drugs)**

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Antiretrovirals (ARVs):</b>	81	18	24	44
Nevirapine (for mother)	48.8	61.1	58.3	38.6
Nevirapine (for newborn)	60.5	72.2	66.7	52.3
Post-HIV exposure prophylactic treatment	38.4	38.9	58.3	27.3
Combined ARVs for mother	89.5	100.0	95.8	81.8
Combined ARVs for newborn	44.2	66.7	54.2	29.5

**Table 21: Percentage of facilities reporting on availability of Contraceptives by type of facility (among facilities with pharmacy/supply of drugs)**

	All Health Facilities (106)	Health Facility Type		
		Hospital	Health Centre	Clinic
<b>Contraceptives</b>	94.3	100	93	75
Combined oral contraceptives	89.0	100.0	92.3	83.9
Implants	93.0	100.0	92.3	91.1
3-month injectables (Depo and Sayana press)	97.0	100.0	96.2	96.4

Intrauterine Contraceptive Devices (IUDs)	75.0	77.8	76.9	73.2
Male condoms	95.0	94.4	88.5	98.2
Female condoms	74.0	83.3	65.4	75.0
Emergency contraception	16.0	38.9	26.9	3.6
Cycle Beads	86.0	94.4	96.2	78.6

*Table 22: Percentage of facilities with basic and emergency newborn supplies and equipment in the maternity area (General), by type of facility*

	Hospital	Health Centre	Clinic	All facilities
Oxygen Concentrator	88.9	14.3	1.7	19.8
Filled oxygen cylinder with cylinder carrier and key to open valve	61.1	10.7	1.7	14.2
Oxygen cylinder regulator	66.7	14.3	1.7	16.0
Ultrasound	66.7	14.3	1.7	16.0
Blood pressure cuff	94.4	67.9	73.3	75.5
Stethoscope	94.4	85.7	90.0	89.6
Fetal stethoscope	94.4	96.4	88.3	91.5
Kidney basins	94.4	92.9	85.0	88.7
Sponge bowls	88.9	71.4	75.0	76.4
Clinical oral thermometer (Axillary and thermo flash)	88.9	89.3	78.3	83.0
Rectal thermometer for newborn	27.8	7.1	15.0	15.1
Scissors	94.4	96.4	93.3	94.3
Needles and syringes (10-20cc)	61.1	39.3	31.7	38.7
Syringes (1ml, 2ml, 5ml, 10ml)	72.2	67.9	70.0	69.8
Needles (21-25 gauge)	66.7	60.7	60.0	61.3
Suture needles/suture materials	61.1	42.9	40.0	44.3
Catheter for IV line (16-18)	55.6	42.9	36.7	41.5
IV Infusion stand(s)	100.0	89.3	93.3	93.4
Urinary catheters	50.0	71.4	70.0	67.0
IV cannulae ( 14-24)	55.6	42.9	40.0	43.4
IV fluid (neonatal giving) set/umbilical catheter	16.7	17.9	6.7	11.3
Uristix (dip stick for protein in urine)	55.6	28.6	15.0	25.5
Adult ventilator bag and mask	11.1	32.1	55.0	41.5
Mouth gauge for airway	88.9	50.0	45.0	53.8
Wheelchair	94.4	60.7	28.3	48.1
Stretcher with trolley	88.9	50.0	18.3	38.7
Examination table	100.0	96.4	98.3	98.1
Labor/delivery table with stirrups	77.8	64.3	70.0	69.8
Labor/delivery table without stirrups	61.1	53.6	45.0	50.0
Partographs	100.0	92.9	90.0	92.5
Dressing forceps	100.0	64.3	83.3	81.1
Surgeon's handbrush with nylon bristles	61.1	10.7	8.3	17.9
Watch or clock with second hand that can be easily seen	94.4	71.4	58.3	67.9

**Table 23: Percentage of facilities with basic and emergency newborn supplies and equipment in the maternity area (General), by type of facility**

	Hospital	Health Centre	Clinic	All facilities
Measuring tape	100.0	96.4	93.3	95.3
Nasogastric tubes or other tubing for oxygen administration	66.7	21.4	6.7	20.8
Blood sugar testing sticks	50.0	39.3	16.7	28.3
Pulse oximeter	61.1	17.9	6.7	18.9
Apnea monitor	33.3	3.6	0.0	6.6
Instrument trolley	77.8	42.9	16.7	34.0
Instrument tray	77.8	71.4	56.7	64.2
Beds	100.0	96.4	96.7	97.2
Linens	88.9	71.4	68.3	72.6
Blankets for cold weather	38.9	32.1	40.0	37.7
Water filter (or other means to make potable water available to patients and staff)	55.6	21.4	25.0	29.2
HIV rapid testing kit	100.0	78.6	83.3	84.9

**Table 24: Percentage of hospitals with an operating theatre (OT) and among those with an OT, the percent with select equipment and supplies**

	Hospitals
<b>Selected Equipment and Supplies in OT</b>	%
<i>Among all hospitals</i>	(n=18)
<b>Hospital has an operating theatre</b>	94.4
<i>Among hospitals with an operating theatre</i>	(n=17)
<b>Hospital has separate OT for obstetric patients</b>	41.2
Basic Items	
Operating table	100.0
Light, adjustable, shadowless	94.1
Surgical drapes	94.1
Syringes, 5ml	76.5
Syringes, 10ml	76.5
Syringes, 20ml	76.5
Needles, 21, 22, 23	64.7
Obstetric laparotomy / cesarean delivery pack	
Stainless steel instrument tray with cover	82.4
Towel clips	94.1
Sponge (ring) forceps, 22.5 cm	100.0
Straight artery forceps, 16 cm	100.0
Uterine hemostasis forceps, 20 cm	100.0
Needle holder	100.0
Surgical knife handle, No. 3	82.4
Surgical knife handle, No. 4	94.1
Surgical knife blades	88.2
Triangular point suture needles, 7.3 cm, size 6	70.6
Round-bodied needles, No. 12, size 6	70.6
Abdominal retractor, size 3	88.2
Abdominal retractors, double-ended	70.6
Operating scissors, curved, blunt 17cm	94.1
Operating scissors, straight, blunt 17 cm	100.0
Scissors, straight, 23 cm	100.0
Suction nozzle	94.1
Suction tube, 22.5 cm, 23 French gauge	94.1
Intestinal clamps, curved, 22.5 cm	82.4

Intestinal clamps, straight, 22.5 cm	82.4
Dressing (tissue) forceps, non-toothed, 15 cm	94.1
Dressing (tissue) forceps, non-toothed, 25 cm	94.1
Sutures (different sizes and types)	70.6
Mini-laparotomy kit	76.5

*Table 25: Percentage of facilities with a laboratory and among those, the percent with equipment and supplies for blood transfusion, by type of facility*

	Type of health facility			
	Hospital (n=18)	Health Centre (n=28)	Clinic (n=60)	All facilities (n=106)
	%	%	%	%
Facility has a laboratory	94.4 (n=17)	85.7 (n=24)	43.3 (n=26)	63.2 (n=67)
Facility has set of guidelines for the laboratory	88.2	70.8	69.2	74.6
Equipment and supplies for blood transfusion				
Refrigerator for blood bank	88.2	12.5	3.8	28.4
Test tubes, small size	88.2	62.5	50.0	64.2
Test tubes, medium size	58.8	29.2	30.8	37.3
Microscope slides	100.0	83.3	96.2	92.5
Compound microscope for cross-matching	64.7	41.7	30.8	43.3
Microscope illuminator	58.8	37.5	53.8	49.3
Blood lancets	100.0	87.5	76.9	86.6
Cotton wool	88.2	66.7	96.2	83.6
Rack	82.4	75.0	65.4	73.1
8.5g/l Sodium chloride solution	17.6	29.2	23.1	23.9
20 Bovine albumin	11.8	8.3	15.4	11.9
Centrifuge, electric	100.0	45.8	19.2	49.3
Centrifuge, hand driven	5.9	29.2	46.2	29.9
38 C Water bath (or incubator)	70.6	12.5	7.7	25.4
Pipettes volumetric, 1ml	82.4	41.7	42.3	52.2
Pipettes volumetric, 2ml	76.5	33.3	26.9	41.8
Pipettes volumetric, 3ml	64.7	33.3	30.8	40.3
Pipettes volumetric, 5ml	47.1	45.8	23.1	37.3
Pipettes volumetric, 10ml	52.9	29.2	23.1	32.8
Pipettes volumetric, 20ml	35.3	29.2	15.4	25.4
Pipette holder of 10 pieces	29.4	33.3	11.5	23.9
Blood typing and cross-matching reagents	82.4	16.7	7.7	29.9
Bags for collecting blood	64.7	12.5	7.7	23.9
Airway needle for giving blood	47.1	16.7	3.8	19.4
Artery forceps	35.3	12.5	15.4	19.4
Anticoagulant bottles	29.4	8.3	11.5	14.9
Scale for blood collection	88.2	12.5	3.8	28.4
Hepatitis B test	70.6	33.3	7.7	32.8
Hepatitis C test	58.8	16.7	7.7	23.9
HIV test	100.0	83.3	88.5	89.6
Syphilis test	64.7	50.0	34.6	47.8

*Table 26: Percentage of facilities with laboratory supplies, by type of facility (among facilities with a laboratory)*

	Type of health facility
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	Hospital (n=17)	Health Centre (n=24)	Clinic (n=26)	All facilities (n=67)
	%	%	%	%
Microscope	100.0	83.3	100.0	94.0
Immersion oil	94.1	75.0	76.9	80.6
Glass rods	41.2	20.8	26.9	28.4
Sink or staining tank	100.0	58.3	42.3	62.7
Measuring cylinder, polypropylene, 25ml	52.9	25.0	15.4	28.4
Measuring cylinder, polypropylene, 50ml	76.5	20.8	19.2	34.3
Measuring cylinder, polypropylene, 100ml	58.8	33.3	15.4	32.8
Measuring cylinder, polypropylene, 250ml	52.9	37.5	7.7	29.9
Measuring cylinder, polypropylene, 500ml	82.4	33.3	19.2	40.3
Wash bottle	41.2	41.7	19.2	32.8
Bottle with buffered water	29.4	45.8	34.6	37.3
Timer clock with alarm	58.8	41.7	50.0	49.3
Rack for drying slides	82.4	54.2	57.7	62.7
Giemsa stain	29.4	29.2	26.9	28.4
Wright stain	11.8	12.5	15.4	13.4
May Grünwald stain	5.9	4.2	3.8	4.5
Funnel and filter paper	82.4	45.8	61.5	61.2
Methanol	47.1	16.7	15.4	23.9
Refrigerator for laboratory supplies	88.2	25.0	11.5	35.8
Glass containers	47.1	20.8	19.2	26.9
Counting chamber (differential counter)	47.1	33.3	15.4	29.9
Pipette, 5ml	70.6	29.2	15.4	34.3
Pipette, graduated 1.0ml	52.9	29.2	19.2	31.3
Dropping pipette	82.4	41.7	46.2	53.7
Cover slips	82.4	29.2	57.7	53.7
Petri dishes	58.8	4.2	11.5	20.9
Bowls, kidney dishes, various sizes, S/S	17.6	25.0	38.5	28.4
Turk diluting solution	11.8	4.2	7.7	7.5
Tally counter	58.8	33.3	23.1	35.8
Hemoglobinometer and hydrochloric acid solution	52.9	33.3	23.1	34.3
Spectrophotometer (symex, screenplus)	29.4	4.2	3.8	10.4
Microhematocrit centrifuge (manual or electric)	70.6	29.2	19.2	35.8
Balance for reading results	70.6	25.0	11.5	31.3
Heparinized capillary tubes, 75mm x 1.5mm	76.5	37.5	11.5	37.3
Spirit lamp	23.5	4.2	7.7	10.4
Ethanol	41.2	20.8	23.1	26.9



Dip sticks (Coubec-10 or URS-10)	58.8	41.7	34.6	43.3
Test tubes	88.2	66.7	46.2	64.2
Test tube rack	94.1	75.0	46.2	68.7
Beaker, 100ml	47.1	16.7	7.7	20.9
Beaker, 250ml	52.9	16.7	7.7	22.4
Beaker, 1000ml	76.5	8.3	7.7	25.4
Ammonia	11.8	0.0	3.8	4.5
Lugol's iodine solution	29.4	20.8	7.7	17.9
CD4 machine	47.1	12.5	0.0	16.4

*Table 27 : Percentage of facilities with obstetric and neonatal care 24/7, by facility type, region and designation*

	Total number of facilities	Facilities with obstetric and neonatal care 24/7
<b>National</b>	<b>106</b>	84.9%
<b>Facility Type</b>		
Hospital	18	94.4%
Health Centre	28	82.1%
Clinic	60	83.3%
<b>Designation</b>		
Urban	61	83.6%
Rural	45	86.7%
<b>County</b>		
Bomi	5	100.0%
Bong	10	100.0%
Grand Bassa	6	100.0%
Grand Cape Mount	6	83.3%
Grand Gedeh	4	50.0%
Grand Kru	4	75.0%
Lofa	9	100.0%
Margibi	7	42.9%
Maryland	4	50.0%
Montserrado	23	87.0%
Nimba	11	90.9%
Rivercess	6	100.0%
Sinoe	3	100.0%
River Gee	3	33.3%
Gbarpolu	5	100.0%

**Annex B: List of facilities surveyed**