



GOVERNMENT OF SIERRA LEONE
MINISTRY OF HEALTH & SANITATION
REPRODUCTIVE AND CHILD HEALTH DIRECTORATE

**Maternal Death Surveillance and
Response District Annual Report
2020**

Foreword

Every year in Sierra Leone, hundreds of pregnant women lose their lives while giving birth. An overwhelming number of these maternal deaths in Sierra Leone are due to preventable factors. Sierra Leone, the presence of more than 1,200 healthcare facilities providing primary, secondary and tertiary care services, has made it possible to bring access to health care close to the doorsteps of millions of households. However, mothers and children continue to suffer from poor health conditions, permanent disability and needless loss of lives from preventable illnesses that are amendable with simple public health measures. Most deaths of pregnant women in the Africa region take place in the first week after delivery especially within the first 24 – 48 hours and are directly related to the quality of care and the health workforce.

Sierra Leone, in line with the global movement of “Every Women and Every Child”, developed a five-year RMNCAH strategy that defined the pathway to accelerate reduction of maternal and child deaths, in line with that, the MDSR system emphasizes the link between information and response. MDSR contributes to strengthen vital registration and better counting of maternal deaths and provide better information for action and monitoring improvements in maternal health.

This 2020 report documents that at least 547 mothers died during pregnancy, childbirth or during the six weeks’ post-partum, captured through the Integrated Disease Surveillance and Response (IDSR) and MDSR systems. There were 34 less deaths than reported in 2019. As we improve on maternal health services, we have seen a gradual reduction in the number of maternal deaths, although the report suggests possible under-reporting. We need to act promptly to address this through strengthening of the reporting and review mechanisms especially at community level with strong ownership by community stakeholders.

The drive towards Universal Health Coverage and human capacity development are important aspects of the national development agenda, which, if achieved, would lead to a marked reduction in preventable maternal deaths. All sectors of government therefore need to collaborate to improve not just the quality of healthcare, but also the quality of life of our mothers and children. Maternal deaths should receive equal attention to the consequences of other life-threatening health conditions. We therefore need all relevant stakeholders and partners in development to work closely with the MoHS to strengthen and transform the health care delivery system into one that drives more effective action, motivate more targeted investments and thereby move us closer to a future where preventable maternal deaths are a thing of the past.

Dr Austin Demby
Minister (Ministry of Health and Sanitation)

Acknowledgements

This year 2020 annual MDSR report continue to highlights the high number of maternal deaths in Sierra Leone as the Ministry of Health and Sanitation (MoHS) and partners continue to collaborate in reducing Maternal mortality.

The MoHS continue to improve and strengthen collaboration, team work, community involvement and use of quality processes and investment in improving the national and district MDSR. The MDSR report will be a reliable data source that will be useful for policy, planning, decision making and advocacy.

The MoHS is thankful for the contribution of World Health Organization (WHO), United Nations Population Fund (UNFPA), United Consortium led by IRC and other partners for providing technical and financial assistance to the MDSR system.

Recognitions and gratitude goes to Dr. Kenneh (Ag. CMO), Dr. Tom Sesay (Director RCH), Dr. Francis Moses (Prog Manager RHFP) and Zainab JuhehBah Tarawally (National coordinator MDSR) whose passion for reversing the trend of maternal mortality in the country is creditable.

Additionally, the MoHS applauds the contribution of the District Health Management Teams (DHMTs) who have worked so firm in conducting maternal death notifications, investigations, reviews and reporting to the national level. Their strength has resulted in a document that we can use to bring a turnaround in the status of maternal mortality in Sierra Leone

Sincere appreciations to the report writing team: Reproductive and Child Health Directorate (RCHD) staffs, Dr Hailu Binyam Getachew (WHO), Mr. Daniel Kamara (Liaison Officer RCHD)

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Finally, I want to thank all those who continue to contribute in diverse ways towards improving the maternal health of women in Sierra Leone.

Dr Sartie Kenneh
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Table Of Content

Table of Contents

Foreword	i
Acknowledgements.....	ii
1. Introduction	4
1.1. Background.....	4
1.2. Structure of the Sierra Leone health system	4
1.3. Status of maternal health in Sierra Leone	4
1.4. Maternal Death Surveillance and Response.....	4
1.5. Purpose of the MDSR 2020 Report	5
2. Methodology	5
3. Findings	6
3.1. Surveillance, Identification and Notification.....	6
4. Descriptive Analysis of Maternal Deaths	8
4.1. Place of Death	8
4.2. Maternal Death by Age	9
4.3. Maternal Death by Gravidity.....	10
4.4. Maternal Death by Parity.....	10
4.5. Maternal Death by ANC Attendance	10
4.6. Maternal Death by Blood Pressure Recorded in Last ANC.....	11
4.7. Maternal Death by Stage of Pregnancy.....	11
4.8. Maternal Death by Mode of Delivery	11
4.9. Maternal Death Reviews.....	12
4.10. Causes of Maternal Deaths	12
4.11. Maternal Death and Outcome of Pregnancy	14
4.12. Contributing Factors for Maternal Death (Delay Model)	14
5. Challenges	16
6. Conclusion	17
7. Recommendations	18

1. Introduction

1.1. Background

Sierra Leone has an estimated total population of 7.4 million, with a life expectancy of 54.31 years at birth, and a crude birth and death rate of 33.41 and 11.74 per 1,000 populations respectively (World Bank, 2020). About 41% of the youth in Sierra Leone are below age 15 years (Statistics Sierra Leone (SSL), 2015). Administratively, the country is divided into five regions, each region is subdivided into districts, and each district is divided into chiefdoms. There are 16 districts and 152 chiefdoms in the country. Close to 41% of the population resides in urban areas, while 59% are in rural settings, (SSL, 2016). Nearly 30% of the population aged 10 years and above are in a polygamous marriage, 13% are in a monogamous marriage and 46% percent were never married. The total fertility rate (TFR) is estimated at 4.2 children per woman (DHS, 2019). Sierra Leone is one of the poorest sub-Saharan African countries with about half of the working-age population engaged in subsistence agriculture (59%). The literacy rate among the population ages 10 years and above was 51% (SSL, 2016).

1.2. Structure of the Sierra Leone health system

The Ministry of Health and Sanitation (MoHS) is the major custodian of health care in Sierra Leone and is supported by health development partners who provide technical and financial support and also involve in direct provision of healthcare services through established health facilities. Primary and secondary healthcare is provided through a system of lower level peripheral health units (PHUs) in communities that feed into higher level secondary healthcare provided through district and regional hospitals. The PHUs include the Community Health Centres (CHC) at chiefdom headquarter towns, and Community Health Posts (CHP) and Maternal and Child Health Posts (MCHP) in villages.

1.3. Status of maternal health in Sierra Leone

Even though the country has seen some improvement in maternal health over the last seven years, Sierra Leone still records a very high Maternal Mortality Ratio of 717 (DHS 2019) from 1,165 (DHS 2013) per 100,000 live births. The lifetime risk has also improved from one in 17 (DHS 2013) to one in 31 (DHS 2019). The under-5 mortality rate decreased from 156 deaths per 1,000 live births in 2013 to 122 deaths per 1,000 live births in 2019. Similarly, infant mortality decreased from 92 to 75 deaths per 1,000 live births and neonatal mortality declined from 39 to 31 deaths per 1,000 live births. The percentage of women receiving ANC from a skilled provider increased from 87% in 2008 to 97% in 2013. However, the percentage remained relatively stagnant in 2019 (98%). The percentage of deliveries taking place at health facilities has increased over time, from 25% in 2008 to 54% in 2013 and 83% in 2019. Accordingly, there has been a significant decrease in deliveries occurring at home, from 72% in 2008 to 16% in 2019.

1.4. Maternal Death Surveillance and Response

The Maternal Death Surveillance and Response program is a surveillance system that tracks all maternal deaths in the country, provides information about the underlying factors contributing to death, and provides a platform for development of an adequate response. The MoHS began conducting maternal death reviews on an ad hoc basis in 2005, as a strategy to reduce maternal deaths in health facilities. Building on lessons learned from the robust Infectious Disease Surveillance and Response (IDSR) program developed to tackle the Ebola epidemic, the MoHS adopted and developed national technical guidelines to strengthen systems and structures for MDSR in July 2015. The development of the national guideline led to the establishment of national and district MDSR committees nationwide as well as the integration of MDSR into the national IDSR system. The MDSR system

had its first full year of operation in 2016, which culminated in publication of the first Annual MDSR Report for 2016 in 2017 and annual reports thereafter.

1.5. Purpose of the MDSR 2020 Report

The National Maternal Death Surveillance and Response guideline recommends that maternal mortality review processes be established, and national maternal mortality reports be published on an annual basis at the national and district level. The report is intended to:

- Highlight the efforts that were put in place to strengthen the MDSR program in the country.
- Provide information to stakeholders on the current status of implementation of MDSR in the country.
- Provide an overview of maternal deaths from collated information for the period January to December 2020.
- Showcase emerging best practices; and
- Discuss continuing challenges and planned strategies to strengthen the existing system and to reduce maternal deaths

2. Methodology

This report was prepared by the Ministry of Health and Sanitation, Reproductive and Child Health Directorate (RCH), which is responsible for supervising, planning, monitoring and evaluating maternal and child health programs in the country. Data for MDSR was collected mainly from the DHIS2, the District MDR report, the Hospital monthly programmatic report, the DHMT maternal death line-list database, and the Weekly Integrated Disease Surveillance and Response data from the Directorate of Disease Prevention and Control (DPC) for the period from January to December 2020. Ad hoc and formal supportive supervision reports were utilized to generate the annual MDSR report.

In collecting the relevant information, all records of reported maternal deaths through the IDSR system and regular line listings were reviewed for the reporting period. Data including live births, stillbirths, ANC attendance, and delivery information were obtained from routine health facility HMIS reports from all functional and reporting health facilities. In writing the reports, the findings from field supportive supervision done by the RCH Directorate to all districts were also included. The report was developed by a team of experts from the Ministry of Health and Sanitation, Reproductive Health and Family Planning program. Data that were collected from the RCH Directorate Maternal Death Line-list database and DHIS 2 were cleaned and analysed based on the identified national MDSR indicators using Excel. Data were summarized using standard descriptive statistics of categorical and numerical variables.

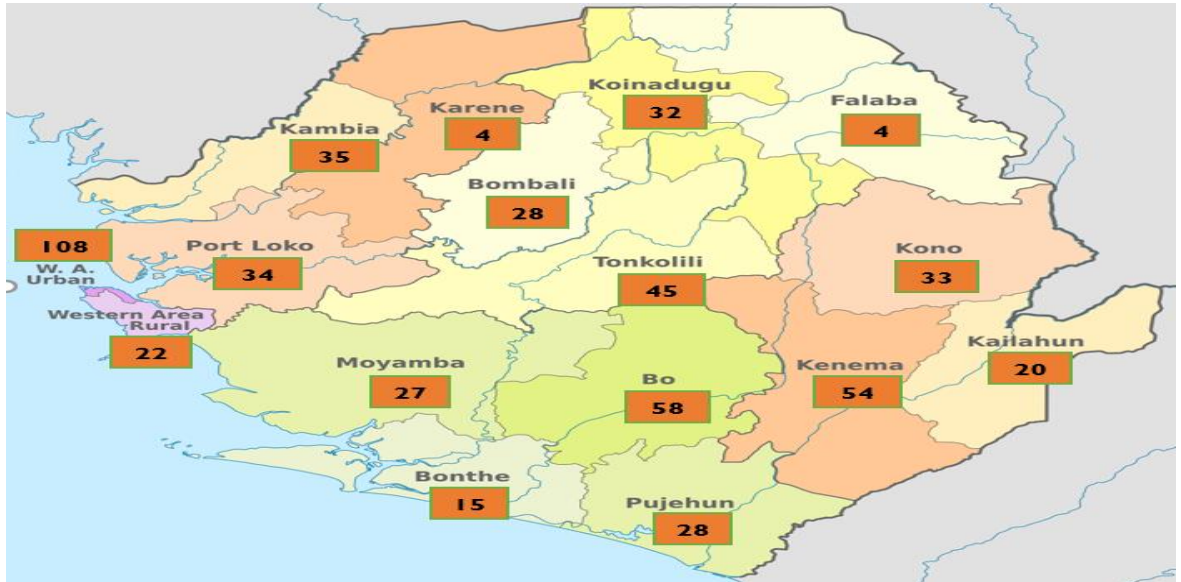
The process of registering maternal deaths starts from the place of death where thorough information is collected and documented in the maternal death investigation forms by midwife investigators and district surveillance officers. Investigation reports, MDR minutes, and maternity registers were all checked for quality and consistency, but challenges in documentation as well as availability of some relevant data affected the analysis of certain indicators in this report.

3. Findings

3.1. Surveillance, Identification and Notification

Fig 1: Distribution of 547 Maternal Deaths by District (Jan – Dec 2020)

Figure 1 shows a summary distribution of maternal deaths nationwide for the year 2020. In total there were 547 reported maternal deaths in all districts – a drop from 581 reported in 2019. Western Area Urban with 108 and Bo with



58 reported the highest maternal deaths whilst Falaba and Karene (two newly established districts) both reported equal numbers of 4 maternal deaths. The differences in the reported numbers of maternal deaths across districts could be attributed to the varying population size, the quality of RCH services, and the sensitivity of the MDSR surveillance system.

Fig 2: Trend of Maternal Deaths (2014-2020)

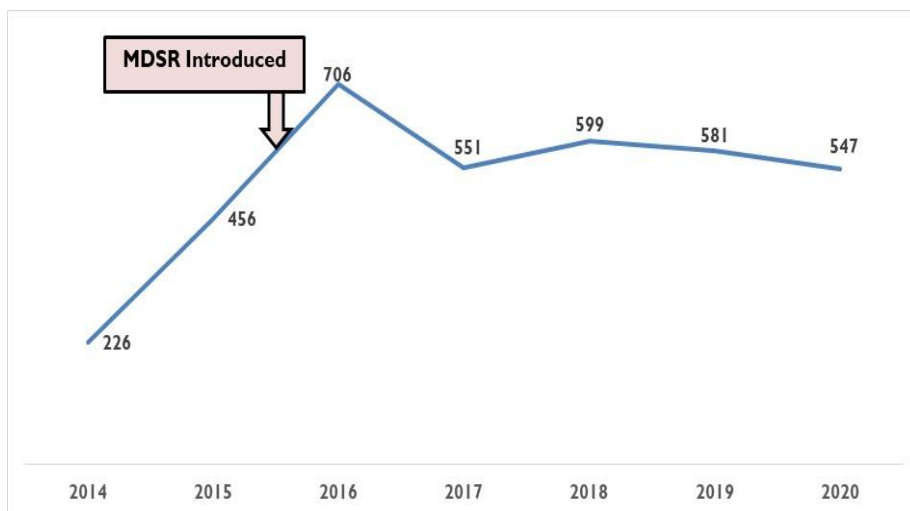


Figure 2 shows a seven-year trend of reported maternal deaths throughout the country from 2014 to 2020. The results show a 101% increase in the number of maternal deaths reported (from 226 to 456) between 2014 and 2015. By the time maternal deaths surveillance and response (MDSR) was introduced in 2016, the number of reported maternal deaths increased by 54% from 456 to 706. It is worth noting that the year 2016 recorded the highest number of maternal deaths so far. Since then, the number has been fluctuating from 551 (2017) to 599 (2018), to 581 (2019) to 547 (2020).

Figure 3: Maternal Deaths by Month, Sierra Leone, 2020

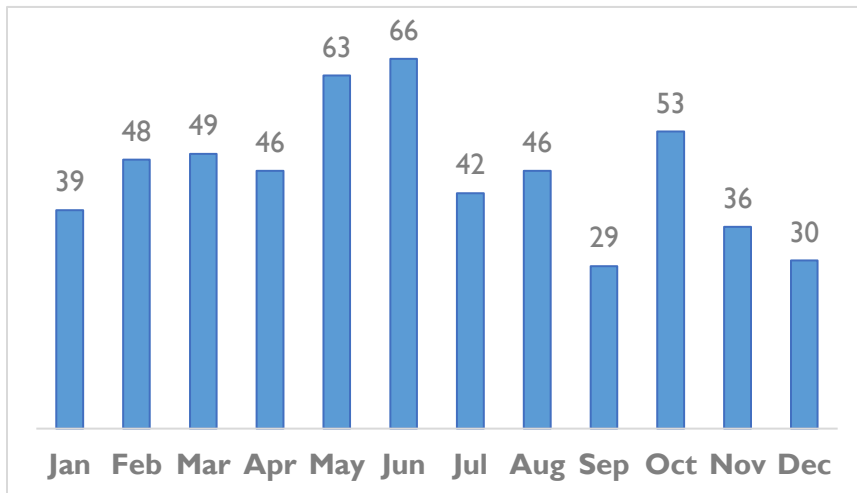


Figure 3 shows the pattern of reported maternal deaths by month in 2020. Sierra Leone has two seasons – the Dry and Rainy Seasons. The Dry Season is from November to April, while the Rainy Season is from May to October. The results showed there were more deaths in the Rainy Season (299) than in the Dry Season (248). May and June recorded the highest number of maternal deaths (63 and 66) while September and December recorded the least number of maternal deaths (29 and 30). The higher number of maternal deaths during the Rainy Season could be

related to the poor road network which is one of the geographical barriers to accessing healthcare services in Sierra Leone. The roads condition is worsened and implicitly translates into more delays in reaching the health facility during the Rainy Season.

Figure 4: Trend of Maternal Death by Epidemiological Week, Sierra Leone, 2020

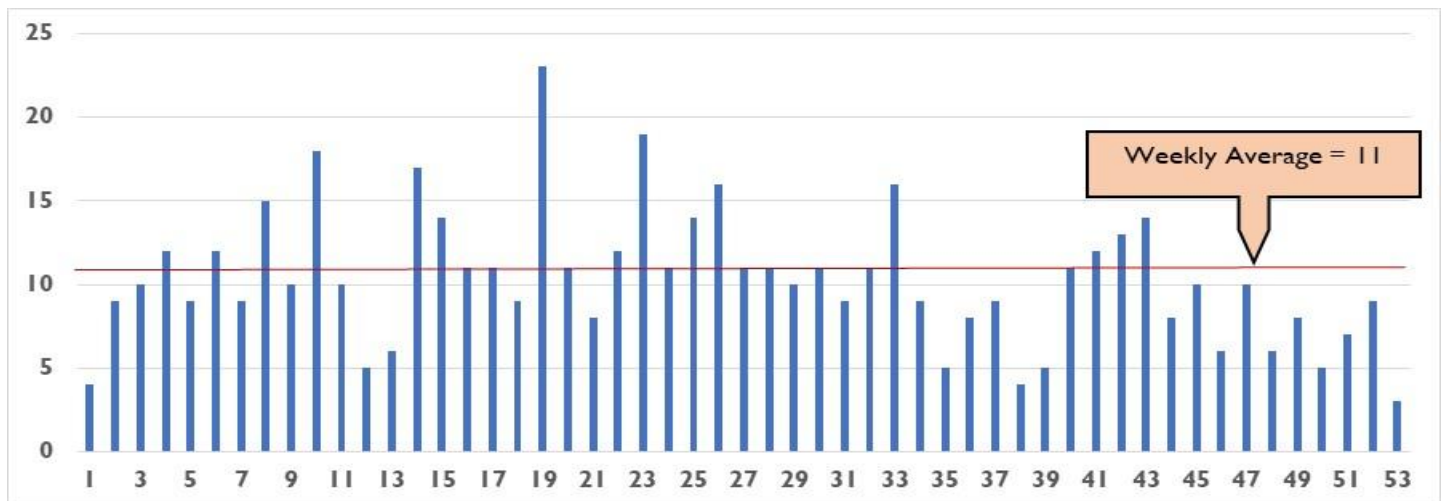
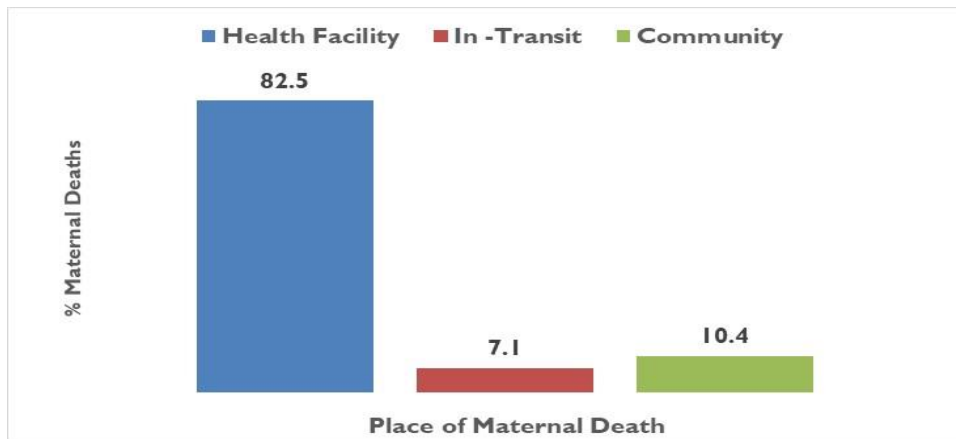


Figure 4 shows the pattern of maternal deaths by Epidemiological Week. Like in 2019, there were 11 maternal deaths per week on average. Further examination of the results shows that the magnitude of weekly reported maternal deaths was consistent with monthly records. In Figure 3, May and June reported the highest maternal deaths (63 and 66 maternal deaths) consistent with Weeks 19 and 23 which recorded the highest number of maternal deaths (23 and 19 maternal deaths) in Figure 4. The high number of maternal deaths in May and June could be attributed to restriction of movements at the outset of the COVID 19 outbreak which also limited health seeking behaviours.

4. Descriptive Analysis of Maternal Deaths

4.1. Place of Death

Figure 5: Place of Maternal Death, January - December 2020

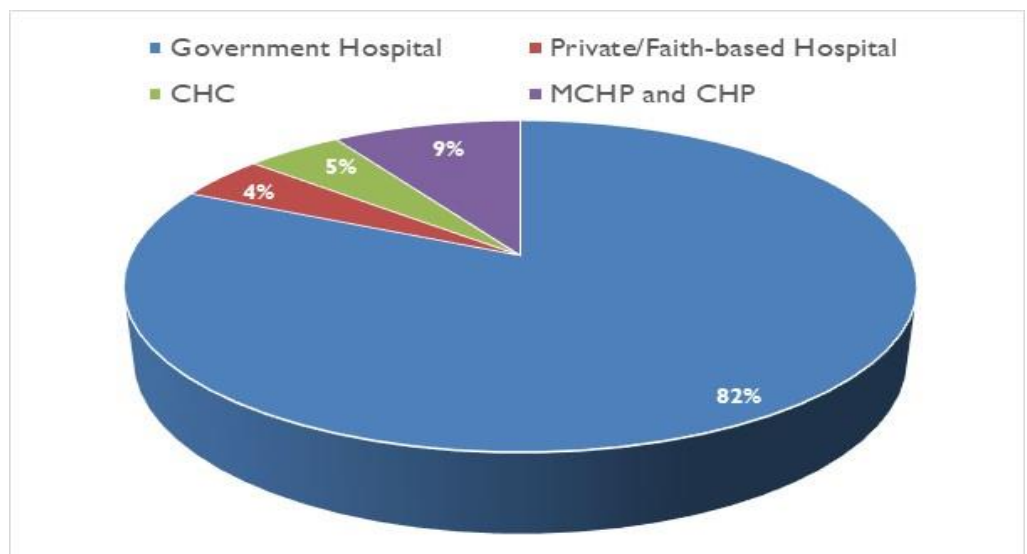


A knowledge of where people die is crucial as this could provide the basis for planning interventions that would increase the chances of survival for women in labour. Figure 6 summarises the percentage of maternal deaths in three locations. These results show that health facilities accounted for 82.5% of maternal deaths a 1.1% increase from the results of 2019 in which up to 81%

of maternal deaths occurred in health facilities. Communities accounted for 10.4%. whilst maternal death on the way to a health facility (In-transit) was 7.1%. Annual MDSR reports consistently shows that most of the maternal deaths occur at the health facilities (76% in 2018, 79% in 2017 etc.), community deaths declined by 0.6% from 11% in 2019 to 10.4% in 2020, while death In-transit declined by 0.9% from 8% in 2019 to 7.1% in 2020.

Figure 5a: Maternal Deaths by Type of Health Facility (N=477)

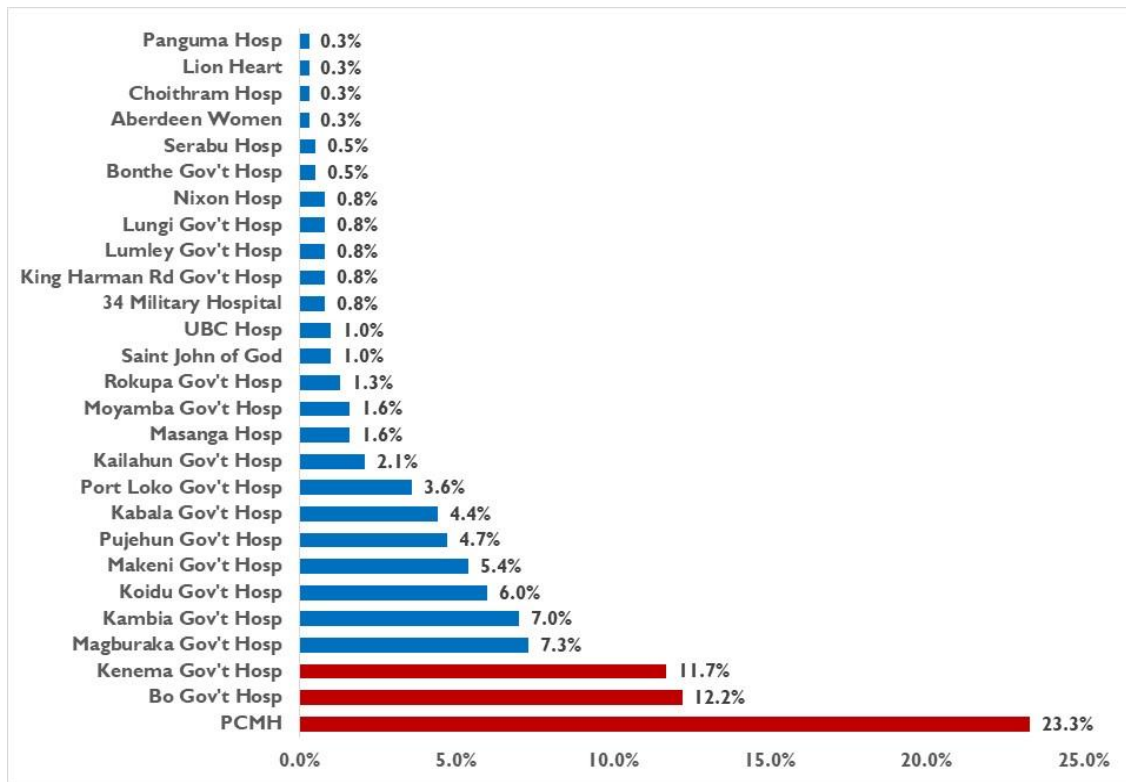
Figure 5a illustrates a summary of maternal deaths by type of health facility. The results shows that Government hospitals accounted for 82% of all deaths occurring in health facilities. This represent a 7% increase in maternal death in Government hospitals in 2020 compared to 2019. CHPs and MCHPs accounted for 9% while CHCs accounted for only 5% (representing a 2% decline from the results of 2019) of all health facility-



based maternal deaths. Private and faith-based health facilities accounted for 4% of maternal deaths - reflecting a 50% decrease from 2019 in which up to 8% of maternal deaths occurred in those facilities. These results should attract government's interest to uncover the underlying causes of the high maternal deaths in government facilities (refer to the Delay Model) and improve on the quality of EmONC services.

Figure 5b: Maternal Deaths by Hospital (N=386)

Figure 5b summarises 386 maternal deaths that were reported in hospitals throughout the country in 2020. Princes Christian Maternity Hospital (PCMH) with 23.3%, Bo Government Hospital (12.2%) and Kenema

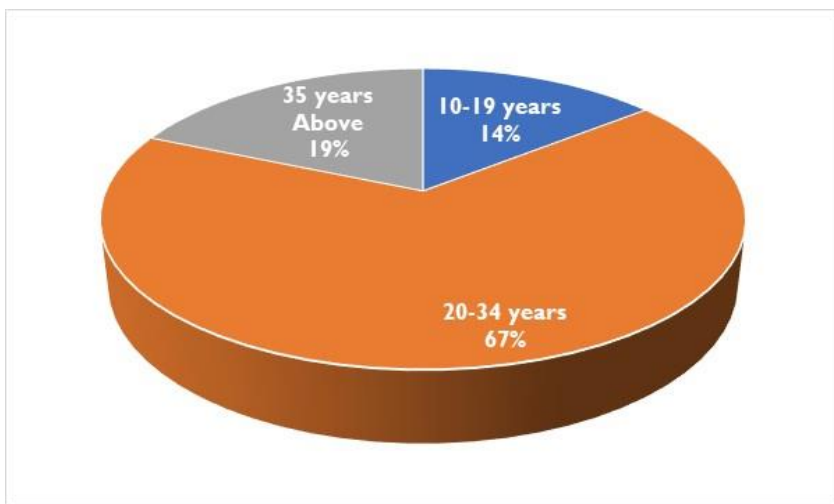


Government Hospital (11.7%) together recorded the highest maternal deaths. Understandably, these are regional and referral hospitals in the Western Urban Area, Southern and Eastern Regions respectively where many moribund cases are referred. Accordingly, these three hospitals accounted for 47.2% of all hospital maternal deaths. Makeni Government Hospital (5.4%) recorded the least proportion of hospital deaths among the regional referral

hospitals. It is important to explore what lessons other regional hospitals could learn to reduce their high maternal deaths. Magburaka (7.3%), Kambia (7.0%) and Koidu (6.0%) are three district hospitals that recorded more maternal deaths than Makeni Regional Hospital. Bonthe Government Hospital (0.5%) recorded the least proportion of maternal deaths in all public health hospitals.

4.2. Maternal Death by Age

Figure 6: Maternal Death by Age



The age bracket for maternal death is critical to determine the population that is the most at risk of maternal deaths during pregnancy so that appropriate interventions can be designed for that age category. Figure 8 shows that most of the maternal deaths (67%) occurred in women aged 20-34 years, followed by women aged 35 years and above (19%) and teenage girls 10-19 years constituted 14% of maternal deaths. It is interesting to note that death by age for 2020 is the same as in 2019. Even though teenagers constitute the least proportion of the maternal deaths, however;

this statistic is still significantly high and thus require stepping up efforts to prevent early marriage and teenage pregnancy.

Maternal Death by Gravidity

Figure 7: Maternal death by Gravidity

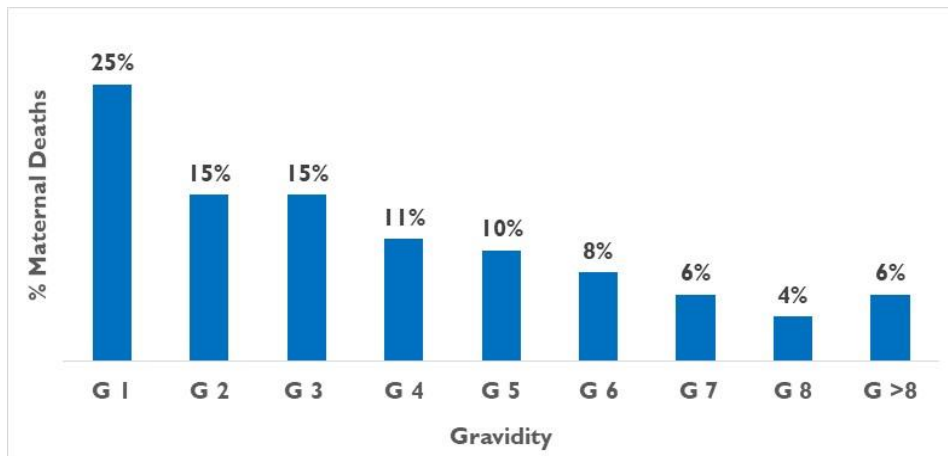
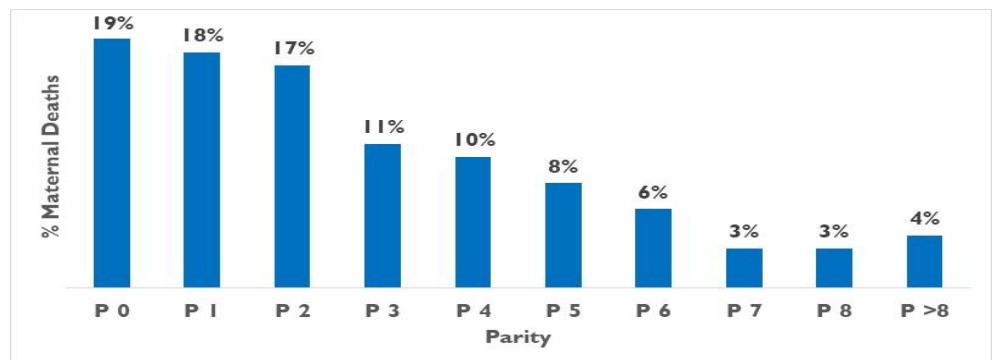


Figure 7 summarises the gravidity of cases of maternal deaths. A review of the obstetric history of the 547 women with obstetric records showed that 25% were Primigravida, almost the same as the 24.8% in 2019. 41% of deaths were between gravida 2 and whiles 34% were grand multigravidas, having had five or more pregnancies.

4.3. Maternal Death by Parity

Figure 8: Maternal Deaths by Parity, January - December 2020

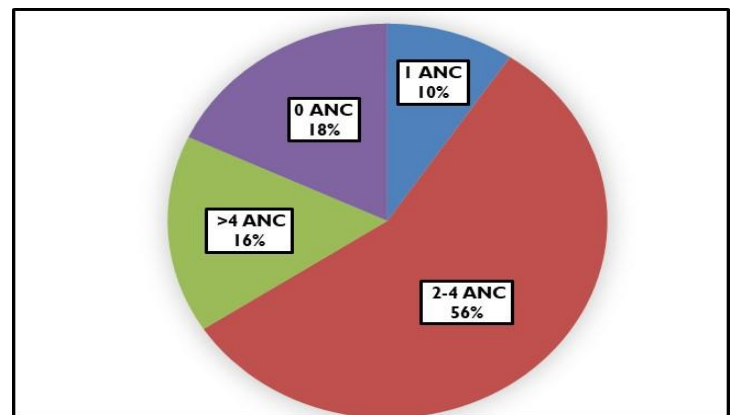
Figure 8 summarises the parity of cases of maternal deaths. The results showed that 19% of the maternal deaths were nulliparous 18% were primiparous 38% were multiparous 14% were grand multiparous and 10% were great grand multiparous



4.4. Maternal Death by ANC Attendance

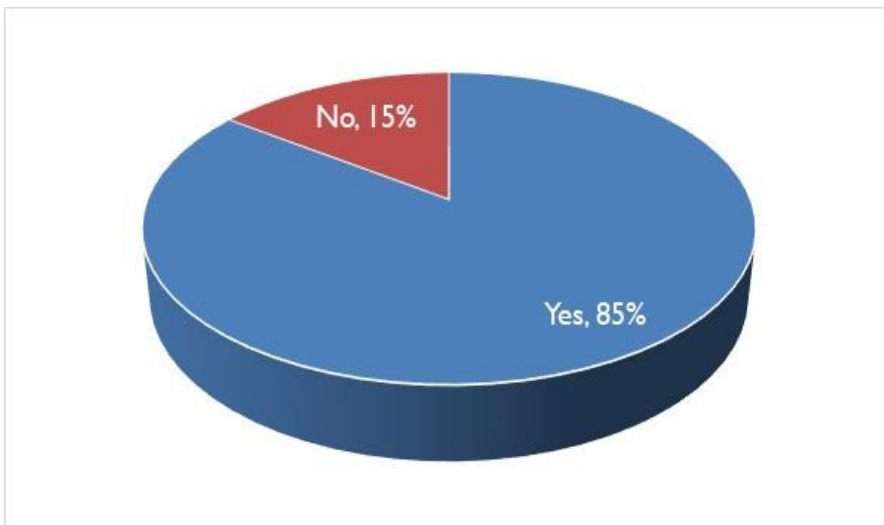
Antenatal care is one of the evidence-based interventions to decrease the probability of bad health outcomes for mothers and their new-borns. However, effectiveness of antenatal care, relies on the quality of care provided during each antenatal care visit. Figure 11 shows that of the 499 maternal deaths reported with information about ANC visit, 82% had at least one antenatal visit a 4% drop from 86% in 2019. Up to 18% of them did not have any antenatal care visit during their pregnancy. These results would suggest further investments in the quality of ANC services and to also emphasise on the new recommendation of 8 ANC visits before delivery

Figure 9: Maternal Death by ANC Attendance



4.5. Maternal Death by Blood Pressure Recorded in Last ANC

Figure 10: Maternal Death by Blood Pressure Recorded in Last ANC

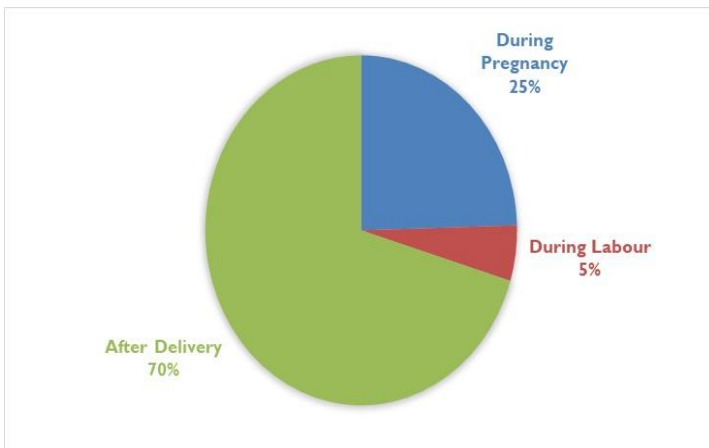


Some women develop hypertension during pregnancy which can put the mother and her baby at risk of complications before, during and after delivery. Hypertension can also cause problems during and after delivery. For the mother, hypertension may lead to pre-eclampsia eclampsia and stroke; and for the baby hypertension can be a risk factor for pre-term delivery and low birth weight. Figure 10 shows that among the 547 maternal deaths reported, up to 15% did not have their blood pressure checked at their last ANC visit. Simple

ANC procedures as taking the women’s BP and following through with appropriate treatments could have saved their lives.

4.6. Maternal Death by Stage of Pregnancy

Figure 11: Maternal Death by Stage of Pregnancy

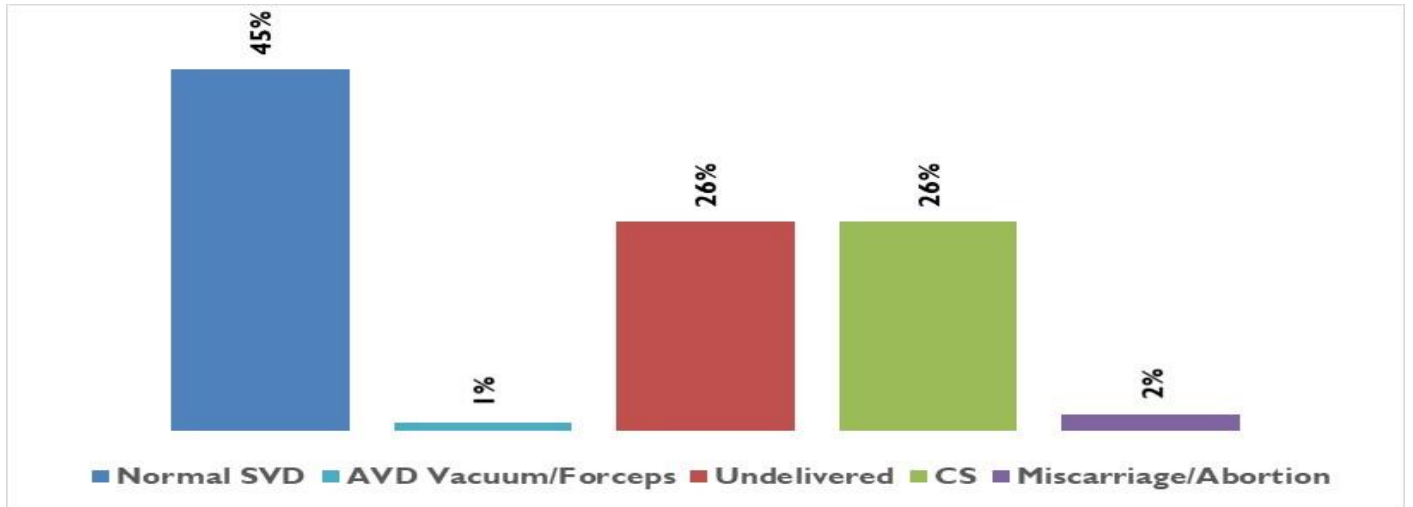


A knowledge of the stage at which a woman dies from pregnancy related causes is important to tailor interventions around that period for improving outcomes during pregnancy, delivery and post-delivery. Results from this assessment revealed that 25% of women died during pregnancy, 5% during labour and 70% after delivery (Figure 13). These results suggest a huge challenge in postnatal care (PNC). If seven out of every 10 women died after a successful delivery, there is need to intensify quality postnatal care services nationwide for women after delivery.

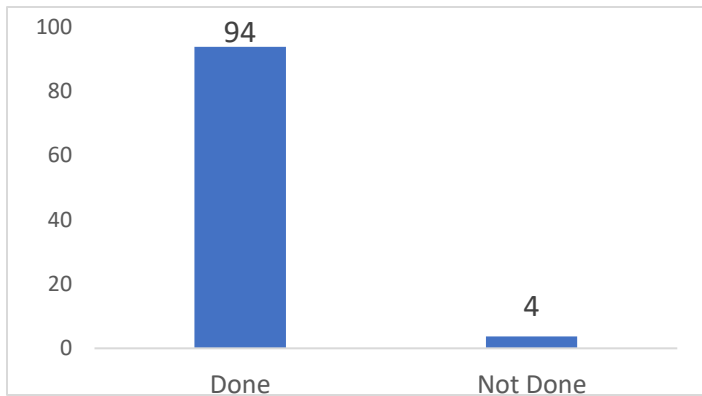
4.7. Maternal Death by Mode of Delivery

Figure 14 summarises the mode of delivery for the number of reported maternal deaths in 2020 nationwide. During the review period, 547 maternal deaths had information about the mode of delivery. Of these, 45% had a spontaneous vaginal delivery, 1% had an assisted vaginal delivery, 26% had a caesarean section, 2% had a miscarriage/abortion and 26% were undelivered when they died.

Figure 12: Maternal Death by Mode of Delivery



4.8. Maternal Death Reviews



Maternal death review is crucial for the reduction of maternal mortality. A reported maternal death review involves an investigation to identify the factors that caused the death and proffering recommendations to avert death of a similar nature. Out of the 547 maternal deaths reported throughout the country, 94% of them were reviewed, 4% were not reviewed and 3% were not specified. The proportion of reviewed cases dropped by 3% compared to 2019 with 97%.

4.9. Causes of Maternal Deaths

Figure 13: Proportions of Maternal Death by various conditions

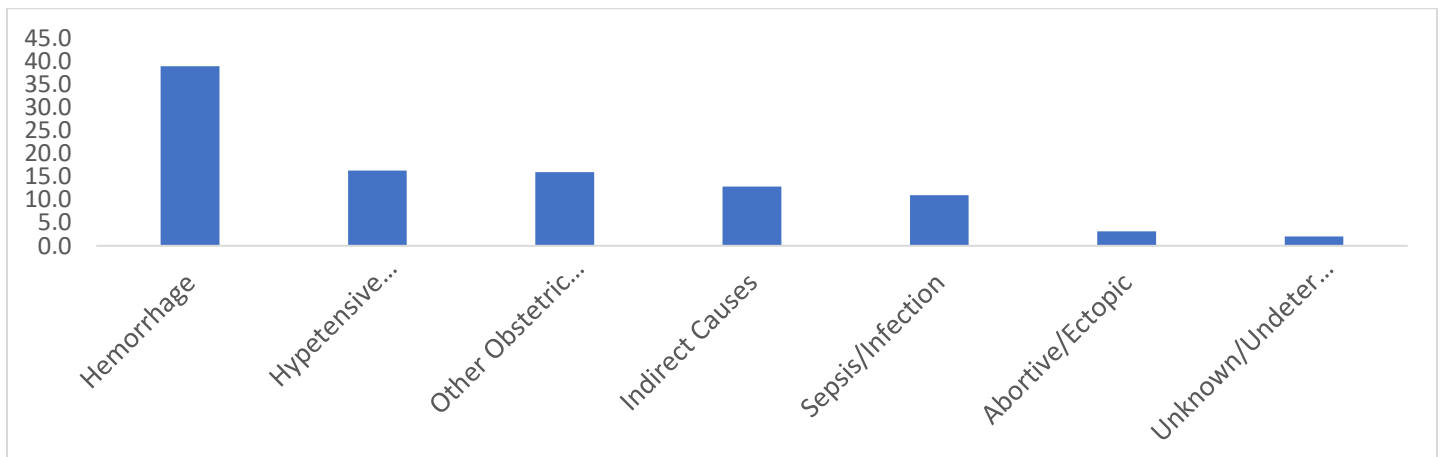


Figure 13 gives a summary of both direct and indirect obstetric complications that resulted in maternal deaths. From 547 reported maternal deaths haemorrhage (38.8%) was the most common direct cause of maternal deaths in Sierra Leone followed by hypertension in pregnancy (16.3%), and sepsis (11.0%) respectively. (Figure 16).

According to the WHO International Statistical Classification of Diseases and Related Health Problems, 10th edition (ICD-10), maternal deaths are subdivided into 2 categories: direct and indirect causes (Table 1). These categories divide the maternal deaths into those that result directly from complications of pregnancy or its management (direct) and those that are due to pre-existing or inter-current disease but where the disease progression was influenced by pregnancy (indirect). Deaths considered to be unrelated to pregnancy are classified as ‘incidental’.

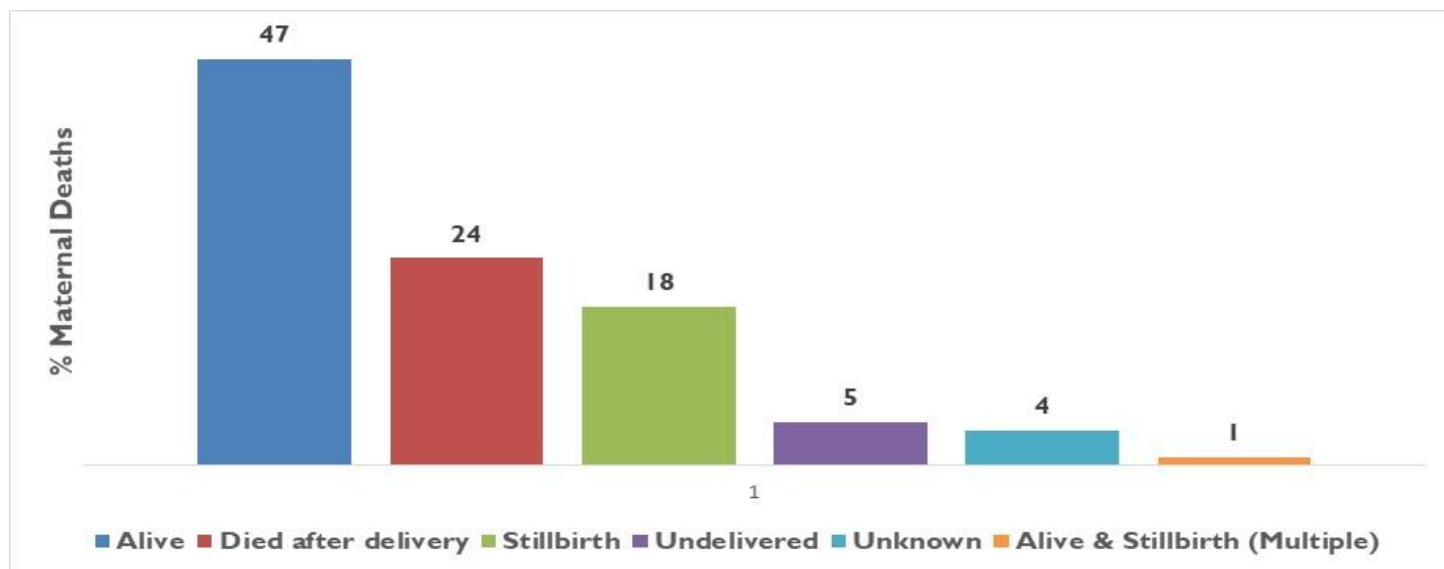
Table 1: Cause of Maternal Deaths, Sierra Leone, January - December 2020

Cause of Maternal Death	No of MDs by Cause (ICD-10 Code)	% of Deaths
Haemorrhage	212	38.8
<i>PPH secondary to Laceration of the Cervix</i>	10	1.8
<i>PPH secondary to Retained Placenta</i>	48	8.8
<i>PPH secondary to Uterine Atony</i>	97	17.7
<i>APH</i>	16	2.9
<i>APH secondary to Abruptio Placenta</i>	8	1.5
<i>APH secondary to Placenta Previa</i>	7	1.3
<i>Intrapartum Haemorrhage</i>	4	0.7
<i>Rupture of Uterus</i>	22	4.0
Hypertensive Complications	89	16.3
Other Obstetric Complications	87	15.9
Indirect Causes	70	12.8
<i>Other Indirect Cause</i>	37	6.8
<i>HIV/AIDS</i>	8	1.5
<i>Malaria</i>	15	2.7
<i>Sickle Cell Anaemia</i>	8	1.5
<i>Tuberculosis</i>	2	0.4
Sepsis/Infection	60	11.0
Abortion/Ectopic	17	3.1
Unknown/Undetermined	11	2.0
(blank)	1	0.2
Total	547	100.0

With disaggregation of the cause of deaths (Table 1), postpartum haemorrhage remains the major cause of maternal death in Sierra Leone (28.3%), followed by hypertension (16.3%), a combination of other obstetric complications constituted 15.9%. Indirect causes made up 12.8% of the deaths while abortion/ectopic pregnancy contributed up to 3.1% of the deaths.

4.10. Maternal Death and Outcome of Pregnancy

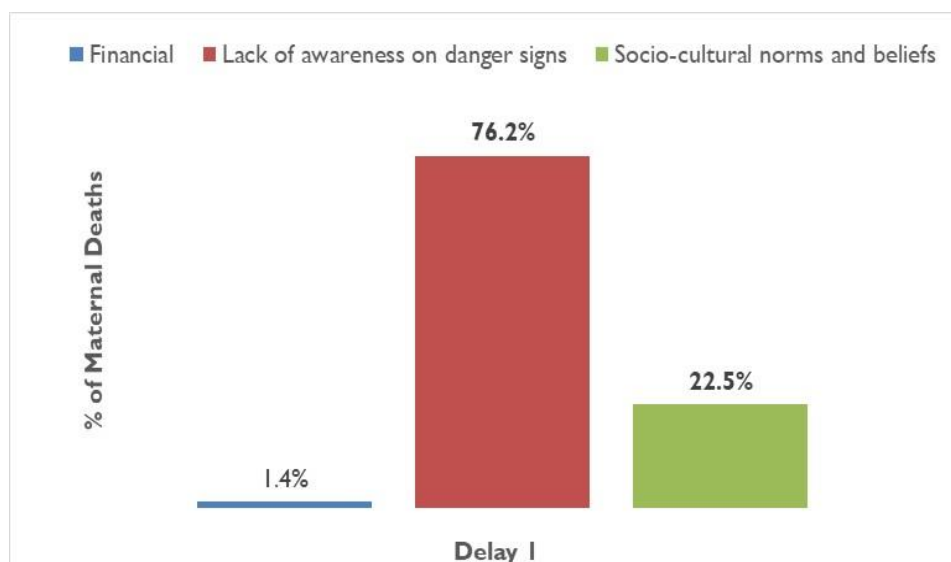
Figure 14: Outcome of Pregnancy for Maternal Deaths cases



A review of the outcome of deliveries for 547 maternal deaths revealed that (47%) were livebirths, 24% were neonatal deaths (died after delivery), 18% were still birth, 5% undelivered, while 1% of maternal deaths delivered multiple babies some alive and some dead (stillbirth).

4.11. Contributing Factors for Maternal Death (Delay Model)

Figure 15: Delay in deciding to go to a health facility, January - December 2020



The prevalence of maternal deaths involve an interplay of both demand and supply factors. The connection of community and health facility challenges to accessing quality healthcare services is summarised into three delays including: a) delay in deciding to go to the health facility, b) delay in accessing the health facility (transportation and travelling related) and c) delay in accessing healthcare services while in the facility.

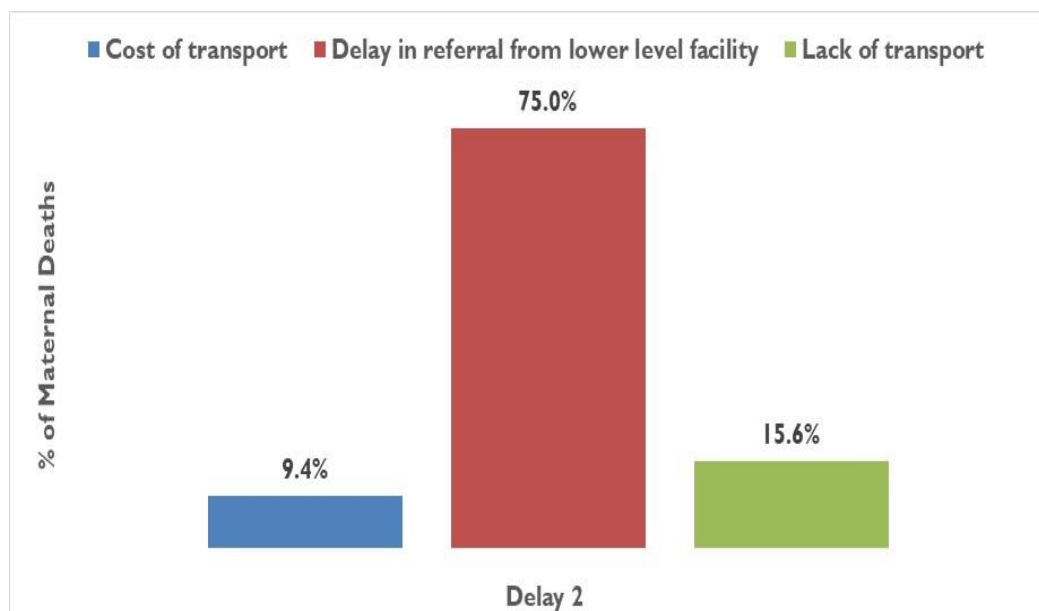
The figure reflects findings of the

first delay related to the underlying determinants that shaped pregnant women’s decision to seek medical attention from a health facility. The results showed that the greatest limiting factor for making the decision to go to the health facility was a lack of understanding of the danger signs in pregnancy which accounted for 76.2% of all reported maternal deaths. Socio-cultural norms constituted 22.5% in delaying the decision to go to the health facility, while the lack of money accounted for only 1.4% to delay a decision in going to the facility among all maternal deaths.

Figure 15 gives a picture of reported limitations that stood in the way of women trying to reach the health facility for advance care. The most predominant challenge was delay in referring women from a lower-level facility to the higher level constituted 75.0% of maternal deaths, followed by lack of transport (15.6%) and difficulty to raise transportation fare (9.4%). Compared to the 2019 report, delay in referral from lower to higher level facilities stood at 67.1%. This challenge has been made worse within one year by 6.9%.

It is worth recollecting that with support from its key donor partners (FCDO and World Bank) the Ministry of Health and Sanitation (MoHS) operationalised a National Emergency Medical Service (NEMS) a national ambulance service in 2018 to alleviate referral challenges between health facilities. However, there were not enough ambulances to be stationed in every chiefdom making referral from the lower to higher level health facilities still a major problem. The management of NEMS has not been without challenges since inception including vehicle maintenance, human resource etc. Now that government has taken complete ownership of its operations, there is need to reprioritise referral and NEMS in the national health planning.

Figure 17: Factors contributing Delay in reaching the Hospital January-December 2020



The health facility is the last hope in the world to save lives not least those of women in labour. If well equipped with the much needed enabling environment, women’s delivery outcomes could be optimised. However, in Sierra Leone the hope of saving the lives of women in an obstetric emergency is dicey as health facilities at all levels still have teething challenges to deliver quality emergency obstetric and new born care (EmONC)

services. Figure 17 shows that poor adherence to EmONC Guidelines (46.2%) and delay in providing care (32.6%) caused the greatest obstacles to saving lives, followed by inadequacies in human resource (12.5%) and the lack of equipment and supplies (8.8%). Health facilities will need to be provided with the enabling environment to improve on quality of services. i.e. improved capacity to provide all the seven and nine signal functions (for primary and secondary level health facilities) together with making sure there is adequate, well trained and motivated staff, reliable electricity, water and sanitation (WASH), drugs and supplies, blood and laboratory services, referral and equipment.

Figure 18: Delay in providing services at the health facility, January-December 2020

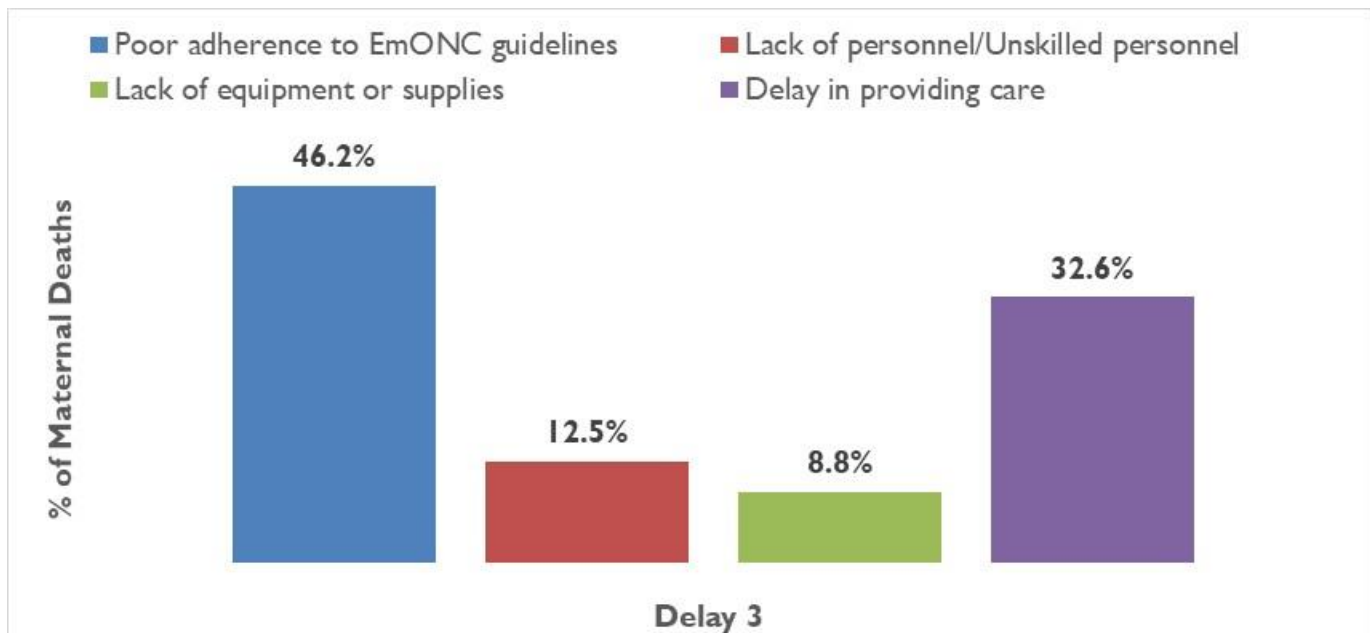


Figure 18 gives a picture of 488 maternal deaths which were reviewed for use of partograph. Opening of partograph and active management of third stage of labour play a significant role in preventing complications and alerting health workers for timely action. If midwives strictly adhere to the national protocol in use of the partograph, they could save lives by taking appropriate action including making timely referral. Unfortunately, however; this assessment revealed minimal use of partograph as only 36% of mothers who died were monitored by completing a partograph during delivery against a whopping 64% without the use of a partograph. This statistic is worse by 8% compared to the 2019 assessment wherein only 56% died without use of partograph. The MoHS would need to provide mentorship and supportive supervision to encourage the use of partograph at all levels.

5. Challenges

The introduction of the MDSR system in Sierra Leone was to facilitate death notification, investigation, and learning from the death review meetings in order to prevent future deaths but there are still challenges with the system. The challenges will be discussed on the experiences and critical issues faced thus far and suggest improvements to overcome them.

National Level

- The National MDSR Committee responsible and overseeing the implementation of the program was unable to organise regular national MDSR committee meetings to review program and challenges as per the national guideline due to resource constraints. The committee did not hold any meeting for the year 2020 and only one national supportive supervision was conducted
- There continues to be weak coordination and poor data management among the IDSR, MDSR and CRVS systems
- Data discrepancy with systems reporting maternal deaths in the ministry (MDSR, IDSR and DHIS2) leads to misconception about the true figure/magnitude of maternal deaths for the year
- The National Office coordinating the system has no funds (No budget attached to the office) for running the program including funding to conduct regular supportive supervision for activities, joint supervision with districts, OJT, and internet facilities

- Evaluation of the system should be done yearly as per national guideline, but it has only been evaluated once in 2018 and this evaluation was conducted by an independent monitor (US CDC/WHO)
- Delay in the integration of Quality-of-Care initiative and MPDSR into the MDSR system

District Level

- There is still weak coordination between the DHMT and Hospital leading to late notification of maternal deaths through the IDSR system
- Some districts' MDSR committee members have not been training on MDSR process, impacting the quality of investigation and review meeting as investigation form, line listing and minutes of reviewed meeting leading to scanty information due to staff attrition from national and district level
- Some hospitals are not keeping records of investigation report and meeting minutes affecting their ability to track progress made on maternal death review findings and to implement recommendations
-
- Delay in collecting patients due to challenges with the NEMS services.
- Stock out of critical medical supplies including blood products and medical equipment.
- Case investigation forms not properly completed resulting to inadequate information during review meetings and incomplete MDSR reporting tools
- Non availability of computers for MDSR data inputting.
- Inadequate district budgetary allocation for MDSR activities.
- Discrepancies between the DHIS, MDSR and IDSR data on maternal deaths.
- Weak feedback mechanism on MDSR reviewed cases to facilities (Hospital and PHUs) where the death occurred
- No functional hospital MDSR committee in most districts with exception of PCMH and Kono
- Inadequate and poor quality of ANC contacts.
- Poor adherence to MoHS protocols

Community Level

- Screening of deaths of women of child-bearing age for suspected maternal death was rarely practiced at community and hospital level, so it is possible that many deaths in the first trimester, deaths secondary to abortion and deaths during home deliveries were not recorded
- Home deliveries is a big challenge in all districts and being done by health staffs, CHWs and TBAs
- Bad socio-cultural beliefs and practice contributing to preventable and avoidable maternal death
- Community members concealing information about the deceased leading to incomplete filling of the MDSR investigation forms making it difficult to classify the cause of death in-line with the ICD - 10 system
- Inadequate knowledge of community members about the danger signs during and after pregnancy

6. Conclusion

The health system is a complex structure consisting of different subsystems, which work together to accomplish the overall goal of improving the health of people. The national initiative to conduct maternal death audits, the national MDSR guideline, and countrywide use of MDSR tools for all cases of maternal deaths in the community and health facilities demonstrate strong political will to improve maternal and child health. Maternal Death Surveillance and Response system shows that all death that occurred in the health facilities, in-transit and community can be prevented or avoided even in resource limited settings evidenced by the number of investigations and review meetings conducted. The investigations done showed that most of the maternal deaths could have been prevented with good quality antenatal services, increased facility deliveries, skilled intra and post-partum care, prompt referrals for emergencies and access to ambulance or essential surgery and safe blood transfusion services. The primary goal of MDSR is to eliminate preventable maternal mortality, with the overall objective to provide information that effectively guides immediate as well as longer term actions to reduce maternal mortality. There has been some overall improvement with the system, as reviews have been conducted and actions/responses taken both at community and facility levels. Health staff are aware of the causes and determinants of death, and analysing these data to select responses that will prevent similar events in future.

MDSR has provided the platform for critical indication of the main causes and contributing factors for maternal deaths. It has also provided valuable details on where interventions for the prevention of maternal death should be focused using data analysis which provides information on number of deaths in the country and by District, EPI weeks, Place of Death, Mode of Deliveries, Gravidity, Parity, Cause and Time of Death. The MDSR report shows that 94% of the death were reviewed though there is a decline from the previous year. WAU (PCMH), Bo and Kenema are the districts with highest maternal deaths while Falaba, Karena and Bonthe recorded the least number of deaths. The age range of the maternal deaths was between 1250 years and haemorrhage and hypertensive disorder are the leading causes of deaths. The month of June and May recorded the most maternal deaths, and this could be related to movement restrictions and the poor health seeking behaviour at the outset of the COVID 19 outbreak. Bad road network during the rains may also have contributed to this observation.

Challenges around poor quality of care would need to be addressed. Like previous years, most maternal deaths occurred in hospitals. This calls for a need to improve on the quality of services in hospitals by improving the numbers and skills of health workers in hospitals particularly midwives and clinicians. There also a need to improve emergency services in the hospitals to improve the survival of obstetric emergencies that are brought to the hospitals. Accountability and regulation of health care personnel is another important area where reform is needed to enable improvements in the quality of care provided to women. Communities need to be empowered to break down barriers that prevent use of healthcare facilities for antenatal care and for deliveries, and they need to be given access to transportation options, so women can utilize healthcare facilities. The National Emergency Medical Services will need to be improved to ensure timely referral of obstetric complications to higher level facilities.

7. Recommendations

The implementing MDSR program will contribute to the strategic objectives of the ending preventable maternal. The data and information generated will contribute directly to the objective to improve quality of care and equity by strengthening MDSR and perinatal death surveillance. The ministry has advanced in implementing the MDSR system, there is still room for improvement. In general, timeliness of reporting, improving the data quality and coverage and analysis will need to be reinforced.

National Level

Recommendation	Responsible Directorate and Development Partner
The National MDSR Committee responsible and overseeing the implementation of the program should provide leadership role, managerial role and organizing regular national MDSR committee meeting to review program and challenges as per the national guideline.	RCH Directorate, WHO/UNFPA/Saving Life Project
There should be strong coordination, leadership and management among IDSR, MDSR and CRVS on data collected from this system	RCH and Disease Surveillance Directorate, NCRA, WHO/UNFPA/Saving Life Project
The MDSR Team to collaborate with Surveillance and DPPI teams on data discrepancy and how to harmonized data quarterly with system reporting maternal deaths(MDSR, IDSR and DHIS2)	RCH Directorate, Disease Surveillance and DPPI
The National Office coordinating the system has no funds (No budget attract to the office) for running the program including funding to conduct regular supervision for activities, join supervision with district, OJT, and internet facilities	RCH Directorate, WHO/UNFPA/Saving Life Project, World Bank,
Annual Evaluation of the system should be done periodically as per national guideline	RCH Directorate, WHO/UNFPA/Saving Life Project

Real Time data for MDSR should be collated, aggregated, analysed and used for decision making quarterly	RCH Directorate,
Ensure MDSR reporting process are clearly understood by all stakeholders and rectified in the national MDSR guideline.	RCH Directorate, WHO/UNFPA/Saving Life Project
Ensure all levels of the MDSR system use a standardized classification system for cause of death	RCH Directorate, WHO/UNFPA/Saving Life Project
The MDSR program needs to be integrated with the MPDSR and Quality of Care initiatives systems and operational framework plan	RCHD/WHO

District Level

Recommendation	Responsible Person
There should be strong coordination between the DHMT and Hospital evidenced by late notification of maternal death through the IDSR system	RCH Directorate, DMO, DHS, MS, Saving Life Project
Training of district MDSR committee members on the MDSR process, impacting the quality of investigation and review meeting	RCH Directorate, WHO/UNFPA/Saving Life Project/Council
Hospital should keeping records of investigation report and meeting minutes to track progress made on maternal death review findings and to implement recommendations	MS, Midwife Investigator
Provide electricity to districts (Moyamba, Bonthe, Kailahun, Koinadugu, Karene, Falaba and Pujehun), so that funds will be allocated directly in order prevent maternal and child health intervention	Ministry of Energy and Power MoHS/Council
Allocation of sufficient Fuel to ambulances should be made available for transporting referred cases	DMO/Saving Life Project
The RCHD and DHMT should ensure adequate supply of equipment, commodities, medication and human resources to improve the quality of care for mothers and new-borns	RCHD ,DHMT, World Bank, Saving Life Project
Desktop computers/Lap tops should be provided to DHMTs for MDSR data in-putting and storage, in all districts.	World Bank, Saving Life Project, WHO,UNFPA
The DHMTs need to provide support to the national MDSR operational plan framework through mobilizing partners, national and local resource	DMO
DSOs should pay attention on notification and harmonization of maternal deaths data in their district to avoid data discrepancies	DMO,DSO
Hospital staff should adhere to MoHS protocols and guidelines to help prevent/avoid maternal deaths	MS, Matron

Community Level

Recommendation	Responsible Person
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CHWs should be encourage to screen all deaths of women of child-bearing age for suspected maternal death, to possible rule out maternal death in the first trimester, deaths secondary to abortion and deaths during home deliveries were not recorded	DHMT, DPHC,RCHD
Conduct Community Sensitization to discourage home deliveries and community to aware about the danger signs during and after pregnancy	DHMT
Encourage community members not to conceals information about the deceased during the MDSR investigation	FMC/PHU
Community engagement should be done in all districts to provide education and advocacy to promote antenatal care and institutional delivery and to encourage reporting of maternal death	RCHD and DHMT