ORIGINAL ARTICLE

ISSN: 3007-4487

SIERRA LEONE JOURNAL OF MEDICINE

The Official Journal of University of Sierra Leone Teaching Hospitals Complex

Journal Homepage: www.sljm.org

An Analysis of Maternal Deaths from a Referral Tertiary Healthcare Facility in Freetown, Sierra Leone

[1,2,3]Ezeanochie M. C., [1,2]Cole R. O., [2]Coker J. F., [1,2,4]Adeniji A. O.

[1]College of Medicine and Allied Health Sciences, University of Sierra Leone, Freetown, Sierra Leone, [2]Department of Obstetrics and Gynaecology, University of Sierra Leone Teaching Hospitals Complex Freetown, Sierra Leone, [3]Department of Obstetrics and Gynaecology, University of Benin Teaching Hospital, Benin City, Edo State, Nigeria, [4]Department of Obstetrics & Gynaecology, College of Health Sciences, Ladoke Akintola University of Technology, Ogbomoso, Nigeria.

Corresponding Author: Michael Ezeanochie;ezeanochie.michael@gmail.com

ARTICLE INFO

Article History

Received: 19 December, 2024

Accepted: 14 July, 2025

Published: November 11, 2025

Corresponding Author:
Michael Ezeanochie

Technical Information

How to Cite: Ezeanochie M. C. et al. An Analysis of Maternal Deaths from a Referral Tertiary Healthcare Facility in Freetown, Sierra Leone: SLJM 2025;Vol 2(1) pp 41-45 https://doi.org/10.69524/sljm.v2i2.170

Editor-in-Chief: Prof. Kehinde S. Oluwadiya, University of Sierra Leone Teaching Hospitals Complex, Freetown, Sierra Leone.

Funding: No funding was received for this study.

Ethical Consideration

Conflict of interest: The authors declare they have no conflicts of interest that are directly or indirectly related to the research.

ABSTRACT

Background: Although progress has been made recently in reducing maternal mortality in Sierra Leone, maternal mortality remains an important public health problem in the country that needs further reduction to meet the SDG targets by 2030.

Methods: This was a retrospective review of 86 consecutive maternal deaths at the Princess Christian Maternity Hospital (PCMH), Freetown from October 2022 to September 2023

Results: The mean age of the study population as 27.1 (SD 5.8) years and majority (88.7%) were between Para 1 to 4. In addition, 16% of patients were booked at Princess Christian Maternity Hospital (PCMH), 53.5% booked at referral health facilities and 30.2% were unbooked. Hypertensive disorders of pregnancy (29.1%), Postpartum Haemorrhage (14%) and Puerperal sepsis (10.5%) were the leading causes of maternal deaths. Most of the maternal deaths occurred with 24hrs of admission into the hospital accounting for 53.5%, while 27.9% died after 24hrs to 72hrs of admission into the hospital. Overall, about 85% of the women experienced delay in accessing or receiving care while Type 3 delay was the commonest form identified in 52.3% of cases respectively.

Conclusion: Maternal mortality remains a public health problem in PCMH Freetown. Hypertensive disorders of pregnancy and postpartum haemorrhage are the leading causes. Delay in accessing or receiving care are contributory to maternal mortality. Addressing these challenges can sustain recent progress that has been made in reducing maternal mortality in Sierra Leone

Key words: Maternal Mortality, Sierra Leone, Hypertensive Disorders of Pregnancy, Postpartum Haemorrhage, Type 3 Delay

1. INTRODUCTION

Although maternal mortality is decreasing globally, sub-Saharan Africa (SSA) continues to record an unacceptably high numbers of maternal death during pregnancy and childbirth compared to other regions in the world[1]. Within SSA, West Africa had the highest numbers of maternal deaths followed by Central and Eastern Africa[1]. The global data on trends of Maternal Mortality Ratio (MMR) for Sierra Leone, showed decreasing MMR trend from 2480 per 100,000 live births in 2 000 to 443 per 100 000 live births in 2020[1]. Although progress has been made in reducing maternal mortality in Sierra Leone, challenges remain in accessing quality maternal health care, especially in meeting the SDG target of MMR of 70 per 100,000 live births by 2030.

Published data from Sierra Leone's MDSR (Maternal Death Surveillance and Response system) platform between 2016 and 2019 reported the leading cause of maternal death was haemorrhage followed by hypertensive disorders and sepsis respectively[2]. This data is similar to population based studies in Sierra Leone and the West African subregion[3,4,5]. While population-based data is of value in understanding the epidemiology of maternal mortality, the causes of maternal mortality at the institutional level of health facilities may differ. This has implications in developing effective interventions to address the problem of maternal mortality within health facilities.

Freetown, the capital of Sierra Leone, is faced with the challenges of rapid urbanisation and popula-

Table 1: Sociodemographic and Relevant Clinical Characteristics of the Study Population

Variable	Number (N-86)	Percentage (%)
Gestational Age At Delivery (Weeks)		
Previable	34	39.5
Preterm	33	38.4
Term	18	20.9
Post term	1	1.2
Mean Age (+/-SD)	27.1(5.8)	
Age Group		
<20	11	12.8
20-35	66	76.7
<35	9	10.5
Parity		
0	5	5.8
1-4	72	83.7
>5	9	10.5
Occupation		
Housewife	32	37.2
Farmer	2	2.3
Trader	35	40.7
Others	17	19.8
Marital Status		
Single	16	18.6
Married	70	81.4
Type of Pregnancy		
Singleton	74	86.0
Twin	12	14.0
Booking Status		
Booked at PCMH	14	16.3
Booked at Referral Facility	45	52.3
Booked Elsewhere	1	1.2
Unbooked	26	30.2

Table 2: Causes of Maternal Mortality

Cause of Death	Number (N=86)	Percentage (%)
Hypertensive Disorders	25	29.1
Post Partum Haemorrhage	12	14
Puerperal Sepsis	9	10.5
Prolonged/Obstructed Labour	7	8.1
Anaemia in Pregnancy	7	8.1
Early pregnancy Complications	6	7
Sickle Cell Anaemia	6	7
Others	14	16.2

tion growth which puts pressure on public social infrastructure (like hospitals), resource constraints and burgeoning informal settlements.6 Since 2010, the Free Healthcare Initiative in Sierra Leone, that provides free healthcare for pregnant women and children, has also contributed to the increase in health facility births in the country from 25% of all deliveries in 2008 to 83% in 2019 and reduced the MMR from 837/100 000 to 443/100 000 livebirths by 2020[1]. Therefore, this study was conducted to determine the leading causes of maternal mortality at a referral Teaching Hospital in an urban location in Freetown and explore factors associated with maternal deaths in the Hospital. The information from this research will be useful in designing evidence based and contextual interventions to further reduce maternal mortality in Freetown.

2. MATERIALS AND METHODS

This was a retrospective review of 86 consecutive maternal deaths at the Princess Christian Maternity Hospital, Freetown from October 2022 to September 2023. The study was conducted at the Department of Obstetrics and Gynaecology, Princess Christian Maternity Hospital in Freetown, Sierra Leone. It is the only tertiary referral Maternity hospital in Freetown with a bed capacity of 200 beds and conducts about 9,000 deliveries yearly. It has the capacity to provide the nine elements of comprehensive emergency obstetric care: blood transfusions, cesarean section, management of severe preeclampsia/eclampsia, manual removal of placenta, assisted vaginal delivery, removal of retained products of conception, parenteral antibiotics, anticonvulsants, uterotonics, and neonatal resuscitation.

The inclusion criteria was all deaths that occurred within the hospital in any women while pregnant, during labour or within 42 days after delivery. Maternal deaths whose case records were insufficient for analysis, from incidental and accidental causes and those that occurred in women after 42 days following delivery were excluded . The primary outcome was to identify the leading causes of maternal mortality in the hospital while other outcomes of interest were to identify the presence of delays in accessing emergency obstetric care (using the 3 delay model as described by Thaddeus and Maine)[7] and to determine the pregnancy outcome in the women. Institutional ethical approval was obtained for this study.

The data for this study was obtained from the patient's case records, proceedings of the daily Departmental clinical review meetings and the monthly maternal death surveillance response meetings. The relevant sociodemographic and clinical information were extracted and inputted into a customised and anonymised data extraction sheet designed for this study. Only members of the research team had access to the database. The results were aggregated and analysed using SPSS version 25 and presented as whole numbers, frequency counts and percentages. Measures of central tendencies were presented as mean and median while dispersion was presented as standard deviation and range.

3. RESULT

There were 88 maternal deaths recorded during the study period but the documentation in 2 case records were considered insufficient for analysis and therefore excluded. So 86 cases were included in this analysis. During the study period, there was 7,713 deliveries which gave an Institutional MMR of 1,115/100 000. The sociodemographic and clinical characteristics of the study population is presented in Table 1. The mean age of the study population as 27.1 (SD 5.8) years and majority (88.7%) were between Para 1 to 4. In addition, 16.3% of patients were booked at PCMH, 53.5% booked at referral health facilities and 30.2% were unbooked. Caesarean delivery occurred in40% of the women.

In Table 2, the leading cause of deaths in the study is presented. Hypertensive disorders of pregnancy (29.1%), Postpartum Haemorrhage (14%) and Puerperal sepsis (10.5%) were the leading causes of maternal deaths. While Prolonged obstructed labour (8.1%), Anaemia in pregnancy (8.1%), Early pregnancy complications (abortions/ ectopic pregnancy) (7%) and Sickle cell anaemia (7%) were also important causes of maternal deaths.

In Table 3, the outcome of pregnancy among the cases of maternal deaths is presented. Mosty of the maternal deaths occurred with 24hrs of admission into the hospital accounting for 53.5%, while 27.9% died after 24hrs to 72hrs of admission into the hospital. While 34.9% had vaginal delivery, 39.5% required caesarean delivery and 38.4% needed blood transfusion, the commonest indication for caesarean section were hypertensive disorders of pregnancy (12.8%) and prolonged/obstructed labour (11.6%).

Table 3: Outcome of Pregnancy and Surgery in the Study Population

Variable	Number	Percentage
Route of Delivery		
Vaginal Delivery	30	34.9
Caesarean Section	34	39.5
Blood Transfusion		
Yes	33	38.4
No	53	61.6
Cadre of Surgeon		
Consultant/Specialist	4	4.7
Resident Doctor/Medical Officer	15	17.4
Non-Physician Surgical Assistant	17	19.8
Foetal Outcome		
Live Birth	27	31.4
Fresh Stillbirth	9	10.5
Macerated Stillbirth	7	8.1
Abortion/Miscarriage	5	5.8
Intra-uterine Foetal Death	4	4.7
Post Partum	12	14.0
*Undelivered	15	16.3
Apgar Score (Mean)		
1st minute ≥ 7	26	30.2
5th minute ≥7	26	30.2
Birth Weight (kg)		
<2.5	19	51.4
2.5-3.9	14	37.8
>4	4	10.8
****Indication for Caesarean Section**		
Prolonged/Obstructed Labour	10	11.6
Hypertensive Disorders	11	12.8
Foetal Distress	1	1.2
Cephalopelvic Disproportion	1	1.2
Breech Presentation	7	8.1
Ante Partum Haemorrhage	3	3.5
Retained 2nd Twin/Foetal Death	1	1.2
Ruptured Uterus	1	1.2
Type of Caesarean Section		
Emergency	31	36
Elective	3	3.5
Duration of Admission Before Mortality		
<24 hours	46	53.5
24-72 hours	24	27.9
>72 hours	16	18.6

*Undelivered refers to pregnancies insitu at the time of death and ectopic pregnancy
**One patient had two indications for Caesarean section

About one third of the women had a live birth (31.4%), normal 1st and 5th minute apgar scores (30.2%), and most of the babies born were low birthweight (51.4%).

In Table 4, the pattern of delays associated with the cases of maternal deaths are presented. Only 15.1% did not experience any type of delay in accessing care while Type 3 delay was the commonest form identified in 52.3% of cases respectively.

Table 4: Delays Identified in Cases of Maternal Mortality

Variable	Frequency (N=86)	Percentage
Type of Delay Identified		
*Indeterminate	2	2.3
No Delay	13	15.1
Type 1	3	3.5
Type 2	23	26.7
Type 3	45	52.3

*The information in the case record was insufficient to conclude

4. DISCUSSION

In this study, it is clear that maternal mortality is still a health problem in PCMH Freetown despite recent progress made in the reduction of maternal mortality in Sierra Leone. It occurred more in young women who have delivered previously and were unbooked for antenatal care at PCMH. In addition, hypertensive disorders of pregnancy was the leading cuse of maternal death ahead of postpartum haemorrhage which was the leading cause of maternal death in population based rsults. Also, about 85% of women experienced delay in accessing or receiving care, and more than 50% died within 24 hours of arrival at the hospital. These results are similar to previous studies that have audited institutional maternal mortality in Sierra Leone and the West African sub region[2,8,9]. Therefore, in planning interventions to address maternal mortality in referral health facilities, it is important to consider the variation in the leading cause of institutional maternal mortality compared to the population based data.

When considering the booking status (place of antenatal care) in our study, majority of the women were either booked in lower level health facilities or did not register for antenatal care at all. It is noteworthy that about 80% died within 72 hours of admission. This suggests that the women were referred in critically clinical conditions and their referral for higher level care was delayedt. In addition, despite the Governments Free Healthcare Initiative (FHI) in Sierra Leone that provides free healthcare for pregnant women and children, women are still not registering for antenatal care which is a free service and it is leading to maternal mortality. A perception of the quality of health care service provided and poor educational exposure have been identified as factors that influence health seeking behaviour by women[10]. This may explain why women are still not utilising the FHI to access health care and needs to be addressed by healthcare administrators. In addition, they should improve the quality of care in peripheral hospitals with a focus on hypertensive disorders of pregnancy and the management of postpartum haemorrhage when designing interventions to reduce maternal mortality.

Many women experienced delay in either accessing or receiving healthcare at the health facility in this study. Thaddeus and Maine recognised that delay in care-seeking decisions made by women contribute to maternal mortality and are influenced by access to money, freedom of movement and limited autonomy in decision making over their health by women[11,12,13]. Also, due partly to the FHI, more women in Sierra Leone are now seeking maternity health care services in hospitals with over 80% of deliveries taking place in health care facilities by skilled birth attendants, up from 54% in 2010[14,15]. This increase may increase the pressure on the health care system that makes it more challenging to adequately provide the required human and material resources necessary to provide adequate quality care. Therefore, in order to bring about a further reduction in the maternal mortality ratio in Sierra Leone, it is important to address the local sociocultural factors that prevent women from accessing health care services promptly and then to sustainably finance and resource the health care system so that factors that contribute to delay in receiving care are minimised.

In this study, consistent with the strong correlation between maternal morbidity and mortality with poor foetal and new-born health outcomes in previously published data,[16,17,18]women who suffered maternal mortality appeared to have high rates of poor foetal/perinatal outcomes such as preterm deliveries, low birth weight babies and foetal wastage (abortions, still births). It is therefore necessary that in order to address the high rate o still births in Sierra Leone, it may be necessary to adopt a holistic ap-

proach that addresses the challenges of maternal health and New -born health together within the same intervention package rather than in silos.

The strength of this study was that it was conducted in a national referral Hospital that receives patients from a diverse population across Freetown while the patient case records were routinely reviewed daily at the Hospital's Departmental clinical meetings to ensure accuracy of data entries. Also all maternal deaths are routinely reviewed at the monthly Maternal and Perinatal Death Surveillance Review (MPDSR) meetings to identify root causes of death and system weaknesses. The limitations of the study wasits retrospective data analysis and therefore the results may be affected by the quality of data collection and documentation. In addition, it was a single facility study which limits the extrapolation of our results to the entire population.

4.1 Conclusion

In conclusion, our results show that maternal mortality is still a health problem in PCMH Freetown and hypertensive disorders of pregnancy and postpartum haemorrhage are leading causes. It occurs predominantly among women who were either unbooked for antenatal care or registered at peripheral health facilities in Freetown but referred to PCMH as an emergency. Delay in accessing or receiving emergency obstetric care promptly was identified as a challenge among the patients in this study and many died within 24 hours of admission. This information can be of value when designing interventions that will sustain recent progress that has been made in reducing maternal mortality in Sierra Leone and bring about further reduction.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to reasons of privacy and confidentiality

Contributor Roles Taxonomy (CRediT) Statement

M.E: was responsible for conceptualisation, data collection, analysis and manuscript preparation

R.C: contributed to the data collection, analysis and preparation of the manuscript

J.C: was responsible for data collection and preparation of the manuscript

A.A: was responsible for conceptualisation, data collection, analysis and manuscript preparation

Conflict of Interest:

The authors declare that they have no financial or personal relationship (s) which may have inappropriately influenced them in writing this paper.

Funding:

The authors received no external funding for this research

Acknowledgment

The authors acknowledge the contribution of health workers and the management of the Princess Christian Maternity Hospital Freetown, Sierra Leone who continue to work assiduously in saving the lives of pregnant women in the country

REFERENCE

1. World Health Organization. Trends in maternal mortality 2000 to 2020: estimates by WHO, UNICEF, UNFPA, world bank group and UNDESA/population division. World Health Organization; 2023;1–86 p
2. Shafiq Y, Caviglia M, Juheh Bah Z, Tognon F, Orsi M, K Kamara A, Claudia C, Moses F, Manenti F, Barone-Adesi F, Sessay T. Causes of maternal deaths in Sierra Leone from 2016 to 2019: analysis of districts' maternal death surveillance and response data. BMJ Open. 2024. 12;14 (1):e076256.
3. Ministry of Health and Sanitation . Sierra Leone national reproductive, maternal, newborn, child and adolescent health strategy 2017–2021. Sierra Leone Minist Health Sanit; 2017
4. Musarandega R, Nyakura M, Machekano R, et al.. Causes of maternal mortality in sub-Saharan Africa: a systematic review of studies published from 2015 to 2020. J Glob Health 2021;11:04048.
5. Say L, Chou D, Gemmill A, et al.. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health 2014;2:e323–33.
6. Kenneth Lynch, Etienne Nel, Tony Binns. 'Transforming Freetown': Dilemmas of planning and development in a West African City. Cities, 2020;Volume 101, 102694, ISSN 0264-2751
7. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. Soc Sci Med. 1994;38(8):1091-110.
8. Ande A, Olagbuji B, Ezeanochie M. An audit of maternal deaths from a referral university teaching hospital in Nigeria: the emergence of HIV/AIDS as a leading cause. Niger Postgrad Med J. 2012;19(2):83-7.
9. Okonofua F, Imosemi D, Igboin B, Adeyemi A, Chibuko C, Idowu A, Imongan W. Maternal death review and outcomes: An assessment in Lagos State, Nigeria. PLoS One. 2017 Dec 14;12(12):e0188392
10. Latunji OO, Akinyemi OO. Factors influencing health-seeking behaviour among civil servants in ibadan, nigeria. Ann Ib Postgrad Med. 2018;16(1):52-60.
11. Thaddeus S, Maine D. To far to walk: maternal mortality in context. Soc Sci Med. 1994;38:1091–1110
12. Sharma V, Leight J, AbdulAziz F, Giroux N, Nyqvist MB. Illness recognition, decision-making, and care-seeking for maternal and newborn complications: a qualitative study in Jigawa State, Northern Nigeria. J Health Popul Nutr. 2017;36:46.
13. Wallace HJ, McDonald S, Belton S, Miranda AI, da Costa E, Matos LDC, Henderson H, Taft A. The decision to seek care antenatally and during labour and birth - Who and what influences this in Timor-Leste? A qualitative project exploring the perceptions of Timorese women and men. Midwifery. 2018;65:35-42
14. Statistics Sierra Leone - SSL and ICF International. 2014. Sierra Leone Demographic and Health Survey 2013. Freetown, Sierra Leone: SSL and ICF International.

15. Statistics Sierra Leone Stats SL and ICF. 2020. Sierra Leone Demographic and Health Survey 2019. Freetown, Sierra Leone, and Rockville, Maryland, USA: Stats SL and ICF International.

16. Olagbuji BN, Ezeanochie MC, Igbaruma S, Okoigi SO, Ande AB. Stillbirth in cases of severe acute maternal morbidity. Int J Gynaecol Obstet. 2012 Oct;119(1):53-6

17. Okonofua FE, Ntoimo LFC, Ogu R, Galadanci H, Mohammed G, Adetoye D, Abe E, Okike O, Agholor K, Abdus-Salam R, Randawa A. Prevalence and determinants of stillbirth in Nigerian referral hospitals: a multicentre study. BMC Pregnancy Childbirth. 2019. 30;19(1):533

18. Tura AK, Scherjon S, van Roosmalen J, Zwart J, Stekelenburg J, van den Akker T. Surviving mothers and lost babies - burden of stillbirths and neonatal deaths among women with maternal near miss in eastern Ethiopia: a prospective cohort study. J Glob Health. 2020. 10(1):01041310