

Curbing Maternal Mortality: Adapting Tools and Interventions

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ABSTRACT

BACKGROUND: The review on curbing maternal mortality: adapting tools and interventions was conceived because maternal mortality tools and interventions exist but not being used in resource poor settings to produce the needed effect. In this article such tools and interventions have been simply exposed. The objectives were to outline the problem of tools and interventions to curbing maternal mortality, to expose ways of adapting tools and interventions and to outline problems of uptake and use of tools and interventions.

METHODS: Sources of information were obtained from internet, books, web site and local magazine. The results obtained were that, the problems that surround adaptability of tools and interventions more precisely affects non-adaptation of tools and interventions to local context and lack of innovation in tools and interventions.

RESULTS: The ways of adapting tools and intervention identified were strengthening of health infrastructure, community engagement and education, improving training and resources, addressing inequities and policy Implementation and monitoring.

CONCLUSION: Possible solutions to uptake was found as improvement of ante natal care, training of health care workers, family planning services, health care infrastructure improvement, policy implementation and monitoring.

KEYWORDS: Maternal Mortality, Adapting Tools and Interventions, Curbing

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1. INTRODUCTION

Over the past five years, maternal mortality rates have shown concerning trends globally and in Cameroon. The maternal mortality ratio (MMR) represents the number of maternal deaths per 100,000 live births. Despite efforts to reduce this number, progress has been slow.

According to the World Health Organization (WHO), maternal deaths have either increased or stagnated in nearly all regions of the world from 2016 to 2020. In 2020, there were an estimated 287,000 maternal deaths globally, a slight decrease from 309,000 in 2016. However, regions like Europe, Northern America, and Latin America and the Caribbean saw increases in maternal mortality rates by 17% and 15%, respectively. The leading causes of these deaths include severe bleeding, high blood pressure, pregnancy-related infections, complications from unsafe abortion, and underlying conditions aggravated by pregnancy. [1]

In the U.S., maternal mortality rates have been on a troubling rise. The number of maternal deaths increased from 658 in 2018 to 1,205 in 2021. The COVID-19 pandemic exacerbated this issue, contributing to the spike in maternal deaths due to increased health care system stress and related complications [2] [3]. The maternal mortality rate for 2021 was reported at 32.9 deaths per 100,000 live births, a significant increase from previous years [4]. These trends underscore the urgent need for improved maternal health care access and quality, particularly in underserved regions and among vulnerable populations. Addressing these disparities through better health care infrastructure, education, and policy changes is essential to reversing these alarming trends. Global Statistics show that in 2019 MMR was approximately 211 maternal deaths per 100,000 live births. In 2020 an estimated 287,000 women died from maternal causes, which translates to

around 223 maternal deaths per 100,000 live births. In 2021-2022 the rates have shown stagnation in most regions. Cameroon after the stagnation has noticed a rise. The COVID-19 pandemic exacerbated challenges, affecting healthcare systems and access to maternal health services. The many political crisis plaguing Cameroon have contributed greatly. However, to meet the Sustainable Development Goal (SDG) of reducing the global MMR to less than 70 per 100,000 live births by 2030, an annual reduction rate of 6.4% is required, which is far from being achieved (5,6,7,8)). Regional Variations show that Sub-Saharan Africa continues to have the highest MMR, with significant disparities within the region. (8)(9) (10) (11)

Maternal Mortality in Cameroon remains high, reflecting broader trends seen across Sub-Saharan Africa. In 2019 the MMR in Cameroon was approximately 529 maternal deaths per 100,000 live births. In 2020 estimates indicate that the MMR was around 467 per 100,000 live births. And in 2021-2022 data suggests little change, with ongoing issues such as inadequate healthcare infrastructure, lack of access to skilled birth attendants, and socio-economic challenges continuing to impact maternal health outcomes. As we speak national statistics put it at 480 deaths per 100000 life birth. [5] [6] [1]

Cameroon's high MMR is influenced by several factors including poverty, lack of education, and limited access to quality healthcare services. Efforts to improve maternal health in Cameroon include increasing access to prenatal and postnatal care, improving healthcare infrastructure, and addressing socio-economic barriers (12) (13) (14) (15) (16) (17). This review will bring to the lamp light the gaps which are in current strategies put in place and provide a platform for further research on how to bring a remedy to the state of things.

2. METHODS

- **Review Type:** This review adopted a systematic approach to identifying and synthesizing literature on the gaps in maternal mortality strategies.

3. RESULTS

3.1. Problems of tools and interventions to curbing maternal mortality

Curbing maternal mortality faces several gaps and challenges, both in the effectiveness and adaptability of the strategies and tools used. Here's an overview of the main gaps:

- **Literature Search Strategy:** A comprehensive search was conducted using PubMed, Scopus, and Google Scholar. Search terms included "maternal mortality," "Cameroon," "healthcare strategies," and "low-income countries." Studies published between 2010 and 2023 were included if they focused on maternal mortality in sub-Saharan Africa, with specific attention to Cameroon. Both observational and intervention studies were considered
- **Inclusion and Exclusion Criteria:** We applied inclusion criteria, such as articles written in English, full-text availability, and studies that examined the effectiveness of interventions or identified healthcare system gaps. Studies were excluded if they did not focus on maternal health or were not peer-reviewed.
- **Selection of Studies: Screening Process,** First, screen by title and abstract. Secondly the full text was screened and adapted. Then a PRISMA flow diagram was used to document the selection process.
- **Data Extraction: Data Extraction Table:** we developed a standardized data extraction form to collect information consistently from all included studies. **Pilot Extraction:** was tested on data extraction process on a small sample of studies to ensure consistency and clarity.
- **Data Synthesis and Analysis:** Results were synthesized thematically, focusing on healthcare accessibility, human resources, and policy implementation gaps. It was Focused on trends, patterns, and gaps in the literature.
- **Bias and Limitations:** Publication bias were not assessed as the choice and scrutiny of the articles followed normal standards. We had limited access to certain databases, regional focus that might not be generalizable to other sub-Saharan countries but limited.
- **Ethical Considerations:** We adhered to ethical guidelines in our data selection and handling process.

Table I: Barriers to curbing maternal mortality 1

Tools and intervention	Associated problems
Healthcare Accessibility and Infrastructure	<p>Geographic Barriers: Many regions in Cameroon, particularly rural and remote areas, have limited access to healthcare facilities. Women often have to travel long distances to reach a hospital or clinic, leading to delays in receiving care during critical times.</p> <p>Healthcare Infrastructure: There is a shortage of well-equipped healthcare facilities, especially in rural areas. Many facilities lack essential medicines, blood supplies, and equipment necessary for handling obstetric emergencies. (20)</p>
Human Resources and Training	<p>Personnel Shortage: There is an inadequate number of trained healthcare providers, including doctors, midwives, and nurses, who are essential for providing maternal health services. This shortage is particularly acute in rural areas.</p> <p>Training and Retention: Continuous professional development and training for healthcare workers are often lacking. Additionally, retaining skilled personnel in rural and underserved areas is challenging due to poor working conditions and inadequate compensation. (21) (22)</p>

Table II: Barriers to curbing maternal mortality 2

Tools and interventions	
Quality of Care	<p>Inconsistent Quality: Even when care is accessible, the quality of maternal healthcare services is often inconsistent. Issues such as poor adherence to clinical guidelines, lack of accountability, and insufficient supervision contribute to suboptimal care.</p> <p>Patient-Provider Communication: Effective communication between healthcare providers and patients is often lacking, leading to misunderstandings, mistrust, and reluctance to seek care. Cultural sensitivity and patient-centered care are areas needing improvement. (22)</p>
Socioeconomic and Cultural factors	<p>Socioeconomic Constraints: Poverty is a significant barrier, with many women unable to afford the costs associated with maternal healthcare, including transportation, medical fees, and related expenses. This is exacerbated by the lack of universal health coverage.</p> <p>Cultural Beliefs and Practices: Certain cultural norms and practices can hinder access to maternal health services. For example, some communities may prefer traditional birth attendants over skilled health personnel, or there may be reluctance to seek care from male healthcare providers. (23)(24)</p>
Policy Implementation and Governance	<p>Policy-Implementation Gap: While Cameroon has policies and strategic plans aimed at reducing maternal mortality, the implementation of these policies is often weak. Issues such as insufficient funding, lack of political will, and poor coordination among stakeholders impede progress.</p> <p>Data and Monitoring: The lack of reliable and comprehensive data on maternal health outcomes hinders effective monitoring and evaluation of interventions. This makes it challenging to identify areas needing improvement and to scale successful strategies. (24)</p>
Community Engagement	<p>Limited Community Involvement: Community engagement is crucial for the success of maternal health interventions. However, in many parts of Cameroon, there is insufficient involvement of communities in planning and implementing maternal health programs. This results in strategies that may not be fully adapted to local needs and contexts.</p> <p>Male Involvement: The involvement of men in maternal health is often limited, even though their support can significantly impact women's health-seeking behaviors and access to care. (26)</p>

Table III: Barriers to curbing maternal mortality 3

Financial and Resource Constraints	<p>Funding Gaps: There is a significant gap between the funding required to effectively implement maternal health strategies and the resources available. This affects the sustainability and scalability of interventions.</p> <p>External Dependency: Cameroon relies heavily on external donors for funding maternal health programs. This can lead to challenges in maintaining programs when external funding is reduced or withdrawn. (27)</p>
Emerging Health Threats	<p>Impact of Conflict and Displacement: The ongoing conflict in the Northwest and Southwest regions of Cameroon has led to the displacement of populations and the disruption of health services. This has further exacerbated maternal health challenges in affected areas.</p> <p>Infectious Diseases: The burden of infectious diseases like malaria, HIV, and COVID-19 continues to strain the health system, diverting resources away from maternal health services. (28)</p>
Adaptability of Tools and Interventions	<p>Non-Adaptation to Local Contexts: Many maternal health interventions are not sufficiently adapted to the local contexts of Cameroon. For example, strategies designed for urban settings may not be effective in rural areas due to differences in infrastructure, cultural practices, and health-seeking behaviors.</p> <p>Lack of Innovation: There is a limited use of innovative tools and approaches, such as mobile health (mHealth) technologies, which could help bridge gaps in service delivery and improve maternal health outcomes.</p>

3.2. Representation of the Gaps from authors

Table IV: Studies Addressing Gaps

Author(s), Year	Study Design and Setting	Population Characteristics	Intervention or Focus	Outcomes Measured	Key Findings
Ojong et al., 2020	Case study in conflict-affected areas of Cameroon	Women in conflict-affected regions	Challenges in delivering maternal health services	Maternal mortality rates, healthcare access	Conflict severely disrupted maternal health services, leading to increased mortality. Health infrastructure was damaged, and there were shortages in medical supplies.
Nkosi et al., 2019	Cross-sectional study in urban and rural Cameroon	Pregnant women in urban and rural areas	Factors affecting access to maternal healthcare services	Healthcare access, ANC implementation	Socio-cultural, economic, and geographic barriers limit access to maternal healthcare. Rural areas face significant challenges due to traditional beliefs and gender norms.
Cameroon Ministry of Public Health, 2020	National policy document	Nationwide	Implementation of national reproductive health policy	Healthcare access, ANC and EmONC strategies	There is uneven implementation of reproductive health policies across regions, especially in conflict-affected areas.
World Bank,	Global report	Global, with	Healthcare	Healthcare	Cameroon's low

2022	on healthcare access and quality	data for Cameroon	access and quality assessment	Access and Quality Index	Healthcare Access and Quality Index score reveals significant service delivery gaps, particularly in rural regions.
African Development Bank, 2021	Health sector performance review	Cameroon, national focus	Health sector performance	Healthcare access, maternal mortality rates	Resource constraints, inadequate training, and systemic inefficiencies are major gaps in Cameroon's health sector.

Interpretation: The studies and reports in this table highlight significant gaps in maternal healthcare delivery in Cameroon. These gaps include:

3.2.1. Geographic and Conflict-Related Barriers

Ongoing conflict in certain regions of Cameroon disrupts maternal health services, causing high maternal mortality rates. The destruction of health infrastructure, threats to healthcare workers, and shortage of medical supplies are direct consequences of the conflict that exacerbate mortality rates (21).

3.2.2. Socio-Cultural and Economic Barriers

Traditional beliefs, gender norms, and economic constraints are significant barriers to accessing maternal health services, especially in rural areas. These socio-cultural and economic factors hinder the uptake of antenatal care (ANC) and skilled birth attendance, leading to higher mortality rates (19).

3.2.3. Systemic Health Sector Issues

Inadequate training for healthcare workers, insufficient resources, and overall inefficiencies within the health sector. These issues lead to poor quality of care, which is a significant contributor to maternal mortality (18).

3.2.4. In-equities in Healthcare Access

Disparities in healthcare access, particularly between urban and rural areas, contribute to maternal deaths. Financial constraints and geographic inaccessibility are significant factors leading to delayed or absent maternal care (23).

A. Strengthening Health Infrastructure in Conflict Zones

To address the impact of conflict, a study suggests enhancing the resilience of health systems in conflict-affected areas. This includes rebuilding infrastructure, ensuring the safety of healthcare workers, and providing adequate medical supplies to these regions (21).

B. Community Engagement and Education

Overcome socio-cultural barriers, there is a need for targeted community education programs that challenge traditional beliefs and promote the importance of maternal health services. Engaging men in maternal health, as suggested by Chukwuemeka et al., is also crucial for improving outcomes (19) (20).

C. Improving Training and Resources

Enhanced training programs for healthcare workers to ensure that they are well-equipped to manage maternal health cases. Additionally, the allocation of more resources to healthcare facilities, particularly in underserved areas, is vital (18).

D. Addressing Inequities

Implementing policies that provide financial support to disadvantaged populations and improve the distribution of healthcare facilities to ensure that even remote areas have access to essential maternal health services (23).

E. Policy Implementation and Monitoring

The uneven implementation of national reproductive health policies needs to be addressed by ensuring that all regions, including conflict-affected areas, receive equal attention. Strengthening monitoring and evaluation mechanisms can help track progress and identify areas needing further intervention (25).

3.3. Possible solutions to the problems with tools and intervention in curbing maternal mortality

3.3.1. Improvement of Antenatal Care

➤ **Cause Addressed:** Low antenatal care (ANC) attendance leads to undiagnosed pregnancy complications, inadequate maternal health education, and missed opportunities for intervention.

- **Suggested Remedy:** Increase the number of women attending at least four ANC visits during pregnancy, ensuring they receive proper monitoring and early detection of complications.

3.3.2. Training Healthcare Workers

- **Cause Addressed:** Lack of adequately trained healthcare workers leads to poor maternal and neonatal care, increasing the risk of mortality.
- **Suggested Remedy:** Implement training programs for midwives, nurses, and doctors to enhance their skills in handling maternal and neonatal care, leading to better outcomes.

3.3.3. Family Planning Services

- **Cause Addressed:** High rates of unintended pregnancies and unsafe abortions contribute significantly to maternal mortality.
- **Suggested Remedy:** Increase access to family planning services to reduce unintended pregnancies and unsafe abortions, lowering the risk of maternal death.

3.3.4. Emergency Obstetric Care

- **Cause Addressed:** Lack of emergency obstetric care (EmOC) facilities leads to preventable deaths during childbirth due to complications.
- **Suggested Remedy:** Equip health facilities with necessary tools and medications for EmOC, ensuring that life-saving interventions are available when needed.

3.3.5. Addressing Unsafe Abortions

- **Cause Addressed:** Unsafe abortions are a leading cause of maternal mortality in Cameroon.
- **Suggested Remedy:** Advocate for Comprehensive Abortion Care (CAC) and train healthcare providers on safe abortion practices to reduce mortality related to unsafe abortions.

3.3.6. Community Mobilization and Education

- **Cause Addressed:** Lack of community awareness about maternal health leads to poor maternal health outcomes and low uptake of skilled birth attendance.
- **Suggested Remedy:** Educate communities about the importance of maternal health, nutrition, and skilled birth attendance, promoting healthier practices and reducing mortality rates.

3.3.7. Health Infrastructure Improvements

- **Cause Addressed:** Inadequate health infrastructure contributes to poor quality of care and high maternal mortality rates.

- **Suggested Remedy:** Upgrade health facilities, ensuring they are adequately staffed and equipped to handle maternal health needs.

3.3.8. Policy and Advocacy

- **Cause Addressed:** Weak policy implementation and lack of advocacy can hinder the effectiveness of maternal health strategies.
- **Suggested Remedy:** Collaborate with organizations like SOGOC to advocate for supportive policies that strengthen maternal health initiatives.

In summary poor policy implementation in Cameroon cannot promote effectiveness in the health care systems as suggested by the authors bellow.

- **Ojong et al. (2020)** highlighted the severe impact of ongoing conflict on maternal health service delivery, emphasizing the need for targeted interventions to ensure that maternal healthcare remains accessible even in conflict zones.
- **Nkosi et al. (2019)** identified various socio-cultural, economic, and geographic barriers to accessing maternal healthcare services, indicating that these issues must be addressed to improve maternal health outcomes across different regions in Cameroon.
- **WHO (2021):** Despite global efforts, Cameroon still has a high maternal mortality ratio, indicating the need for more targeted interventions.
- **UNICEF (2022):** While there have been improvements in maternal and newborn health, challenges remain in ensuring safe deliveries and reducing mortality rates, particularly in rural areas.
- **Cameroon Ministry of Public Health (2020):** The National Reproductive Health Policy outlines critical strategies, but implementation is inconsistent, with significant gaps in conflict-affected regions.
- **IHME (2023):** The Global Burden of Disease Study highlights Cameroon's high maternal mortality burden, emphasizing the need for improved healthcare access and quality.
- **World Bank (2022):** Cameroon's low score on the Healthcare Access and Quality Index underscores the need for better healthcare infrastructure and service delivery.
- **African Development Bank (2021):** The health sector in Cameroon faces significant challenges that must be addressed to improve maternal health

outcomes, including resource allocation and healthcare worker training.

3.4. Ways of adapting tools and interventions for curbing maternal mortality

- **Adaptation of tools and intervention to Local Contexts:** Many maternal health interventions are not sufficiently adapted to the local contexts. For example, strategies designed for urban settings may not be effective in rural areas due to differences in infrastructure, cultural practices, and health-seeking behaviors. So tools and interventions adapted to these each context will be good.
- **Innovation:** There is a limited use of innovative tools and approaches, the use of innovative tools such as mobile health (mHealth) technologies, could help bridge gaps in service delivery and improve maternal health outcomes.

CONCLUSION

From the above review article, we saw that there are many interventions and tools put in place for curbing maternal mortality for example health infrastructure, human resource, ANC, governance and policies. We also outline that there are problems in the interventions and tools evidence by high maternal mortality rate. So the study discovered possible solutions to this tools and interventions such as Improvement of ANC, training of health personnel, improvement of family planning services, and good practice of emergency and neonatal care. For this to happen, the study therefore broad out ways of adapting tools and interventions, the major way being adapting of tools and interventions to local context and the use of innovative tools and interventions.

RECOMMENDATION

Need for an Adaptable Model: There is a critical need for a flexible, adaptable model that can address these challenges by tailoring strategies to local contexts and specific needs. Such a model should integrate the following components:

1. **Localized Interventions:** Develop strategies that account for regional variations in healthcare access, infrastructure, and cultural practices.
2. **Enhanced Data Utilization:** Utilize real-time data and feedback to continuously improve and adapt interventions.
3. **Community Engagement:** Strengthen community involvement to ensure that maternal health programs are culturally sensitive and effectively address local barriers.

4. **Resource Optimization:** Ensure efficient allocation and use of resources to support effective program delivery and sustainability.

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