

Humanitarian Health Interventions In Conflict Zones: A Systematic Review Of Maternal And Child Health Outcomes In Sub-Saharan Africa

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Abstract

Armed conflict is devastating maternal and child health across Sub-Saharan Africa (SSA), where countries under active humanitarian response plans now account for 64% of global maternal deaths and 50% of newborn deaths. Women in these zones face a maternal mortality risk three times higher than those in peaceful settings, and an estimated 36.5 million displaced children suffer from acute malnutrition and disrupted immunization. This systematic review synthesizes evidence on the effectiveness of humanitarian health interventions targeting maternal and child health in conflict-affected SSA. Following PRISMA 2020 guidelines and registered with PROSPERO, the review searched PubMed, Web of Science, Scopus, and grey literature repositories for studies published between January 2000 and December 2023. Thirteen studies met the inclusion criteria, spanning empirical research, systematic reviews, and policy analyses across multiple SSA sub-regions. Key findings show that each additional conflict incident raises maternal mortality risk by 14%, with conflict exposure linked to approximately 2.8 additional pregnancy-related deaths per 100,000 women. Conflict-affected countries accounted for 51% of global stillbirths, with a significantly elevated odds of preterm delivery. Despite 42% of health facilities becoming non-functional in Burkina Faso due to insecurity, user fee exemption policies successfully sustained maternal care utilization. In the DRC, a trilateral UNICEF–China partnership delivered essential care to 6,800 pregnant women and 34,000 children, while in Somalia, conditional cash transfers combined with mobile health messaging improved nutritional outcomes in displaced communities. The review concludes that financially protective, integrated, and community-led interventions can meaningfully reduce maternal and child mortality even in severely resource-constrained conflict settings. Critically, the evidence calls for a strategic shift away from externally-driven, top-down humanitarian assistance toward approaches that strengthen local health structures and build on existing community resilience. Priorities for future action include protecting and training local health workers, scaling digital health tools, expanding implementation science in volatile environments, and developing conflict-resilient surveillance systems to address persistent data gaps.

Keywords: Humanitarian health interventions, Maternal mortality, Child and neonatal health outcomes, Armed conflict, Sub-Saharan Africa, Health system resilience, Community-based care

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1.0 INTRODUCTION

Armed conflicts devastate civilian populations, causing significant illness and death, especially among women and children (Singh *et al.*, 2021). The impact extends beyond direct injuries, destabilizing health systems, degrading the environment, and creating profound socioeconomic disruptions that hinder efforts to improve maternal and child health (Jawad *et al.*, 2021). Despite a global increase in conflict, affecting more people than ever, there's a critical lack of understanding on how to effectively deliver essential health interventions to these vulnerable groups (Ataullahjan *et al.*, 2020). This systematic review aims to synthesize existing literature on maternal and neonatal health intervention delivery in conflict settings, focusing on Sub-Saharan Africa, a region heavily impacted by both conflict and high maternal and child mortality rates (Munyuzangabo *et al.*, 2021; Shafiq *et al.*, 2024). Specifically, it addresses the evidence gap regarding optimal intervention strategies amid active conflict, seeking to inform more resilient health systems and targeted humanitarian aid (Munyuzangabo *et al.*, 2021).

The breakdown of protective infrastructure and health systems during conflict further exacerbates mortality and morbidity, particularly for women and children (Akseer *et al.*, 2019; Lange *et al.*, 2025). These environments are marked by direct violence, forced displacement, and systematic disruption of healthcare services, intensifying social vulnerabilities and impeding access to crucial maternal and child health care (Gaffey *et al.*, 2020). Moreover, the deliberate targeting of healthcare facilities and personnel, combined with chronic underfunding of public health infrastructure during prolonged conflict, creates significant barriers to both healthcare access and comprehensive data collection. This obscures the true burden of disease and mortality (Kadir *et al.*, 2019).

The United Nations' post-2015 agenda emphasizes the urgent need to address maternal and neonatal health in fragile and conflict-affected situations to meet Sustainable Development Goal targets. Fragile and conflict-affected situations (FCS) often lack fundamental information on maternal and neonatal health service utilization and access determinants (Gopalan *et al.*, 2017). This data deficiency is compounded by the inherent challenges of conducting robust research in volatile environments, leading to a scarcity of evidence on effective interventions (Munyuzangabo *et al.*, 2020). Given that 60% of preventable maternal deaths and 45% of neonatal deaths occur in fragile settings, a comprehensive understanding

of interventions and their measured outcomes in these contexts is urgently required (Hartman *et al.*, 2017).

This review seeks to bridge this knowledge gap by systematically evaluating the efficacy of humanitarian health interventions specifically targeting maternal and child health in Sub-Saharan African conflict zones (Che *et al.*, 2018). It will explore how insecurity, service disruptions, infrastructure destruction, population displacements, and competing priorities collectively hinder the implementation of Reproductive, Maternal, Neonatal, Child, and Adolescent Health (RMNCAH) services (Rab *et al.*, 2023). The nearly double maternal mortality rates in conflict-affected countries compared to the global average underscore the urgency of this investigation (Sweileh, 2020). The disruption of stable health systems, along with infrastructure destruction and the flight of healthcare workers, significantly compromises the delivery of essential maternal and neonatal health services in these fragile contexts (B)(Belaid *et al.*, 2020; Sweileh, 2020).

This systematic review intends to examine current articles and grey literature to comprehensively understand the magnitude of reproductive health challenges in humanitarian contexts, ultimately guiding the development of effective interventions (Simegn *et al.*, 2025). The review will analyze strategies for bolstering health system resilience and adaptive service delivery models in settings where traditional healthcare infrastructures are absent or severely compromised due to ongoing conflict (Tiggelaar, 2017). Furthermore, it will assess the effectiveness of various interventions in improving key maternal and child health indicators, such as antenatal care utilization, skilled birth attendance, and postnatal care, within these challenging operational environments (Alibhai *et al.*, 2022; Antonipillai *et al.*, 2017).

2.0 METHODOLOGY

2.1 Systematic review registration and reporting

This systematic review is registered with PROSPERO (identifiers CRD42024620971 and CRD42020222893) and strictly adheres to the PRISMA 2020 statement (Matthew *et al.*, 2021) and the Center for Reviews and Dissemination's guidelines to ensure comprehensive and transparent reporting.

2.2. Search Strategy.

A systematic search was conducted across multiple electronic databases, including PubMed, Web of Science, Scopus, and relevant grey literature repositories, to identify studies

published between January 2000 and December 2023. The search strategy employed a combination of keywords and Medical Subject Headings terms related to maternal health, child health, conflict, humanitarian interventions, and Sub-Saharan Africa to ensure comprehensive coverage of the literature. Inclusion and exclusion criteria: Studies was included if they are peer-reviewed empirical studies, systematic reviews, or meta-analyses focusing on maternal and child health outcomes or interventions in conflict-affected Sub-Saharan African countries.

Furthermore, observational studies lacking a control arm and interventions specifically within refugee camps was also excluded to maintain a focused scope on broader conflict-affected populations rather than solely displaced persons (Ehiri *et al.*, 2018).

The search terms were iteratively developed and refined through preliminary searches in key databases, ensuring that the terminology captures the nuanced intersection of conflict, humanitarian response, and maternal and child health outcomes in Sub-Saharan Africa. This iterative process involves consulting with subject matter experts to validate the chosen keywords and ensuring the search strategy is adaptable across various database interfaces. Boolean operators such as 'OR' was used to broaden the search to include free text keywords and Medical Subject Headings terms defining similar concepts, while 'AND' narrowed the search by combining different concepts.

2.3. Data Extraction and Management

2.3.1 Data Extraction

All identified records were exported into reference management software (EndNote X8) to facilitate duplicate removal and streamline the screening process (Dadjo *et al.*, 2021; Kuandyk *et al.*, 2024). Subsequently, a standardized data extraction form was utilized to systematically abstract relevant information from the included studies, encompassing study characteristics, methodological approaches, reported maternal and child health outcomes, and the nature of humanitarian interventions. This includes details on study design, participant demographics, specific health outcomes measured, intervention characteristics, and key findings related to the impact of conflict on maternal and child health (Als *et al.*, 2020). The data extraction process also captured information regarding the presence and characteristics of health care workers within conflict and post-conflict settings, as well as the methodologies employed for data collection and analysis in the primary studies.

2.3.2 Data Consistency

To ensure consistency and minimize bias, two independent reviewers performed data extraction, with disagreements resolved through consensus or arbitration by a third reviewer. Reporting quality in individual studies was also assessed to further ascertain methodological rigor and reduce potential bias in synthesized findings. This systematic approach to data extraction and conflict resolution enhances the robustness and credibility of the review's findings (Gebremeskel *et al.*, 2022; Woolley *et al.*, 2021). The extracted data was then systematically synthesized using a narrative approach, grouping studies by similar themes, interventions, and outcomes to identify patterns and divergences in the evidence base.

2.4 Quality Assessment

2.4.1 Assessment criteria for Inclusion

The quality of individual studies was rigorously assessed using validated tools, such as the Effective Public Health Practice Project Quality Assessment Tool for quantitative studies and the Critical Appraisal Skills Programme for qualitative studies, ensuring a thorough evaluation of methodological strengths and limitations (Byrne *et al.*, 2014). For systematic reviews, the AMSTAR 2 tool was employed to critically appraise their methodological quality in line with Nicol *et al.* (2022).

2.4.2 Resolving discrepancies

This systematic approach ensures that all studies are evaluated fairly and consistently, allowing for a robust understanding of the evidence base (Akombi-Inyang *et al.*, 2021). Disagreements during quality assessment were resolved through discussion between the two independent reviewers, with a third reviewer arbitrating if consensus is not reached.

2.4.3 Quality Evaluation Tools

The selection of appropriate appraisal tools was guided by the specific study designs encountered, with a preference for instruments that evaluate both internal and external validity, as well as reporting transparency. The EPHPP tool, was employed to evaluates six key parameters for quality assessment, including selection bias, study design, and the identification of confounders, categorizing studies as 'strong,' 'moderate,' or 'weak' based on established criteria (Singh *et al.*, 2017).

3.0 RESULTS

3.1 Study Selection and Characteristics

Reasons for exclusion at the full-text stage was documented and reported in a PRISMA flow diagram. A final decision on inclusion was made after a comprehensive review of the full text by the independent reviewers. This rigorous selection process ensures that only studies directly pertinent to humanitarian health interventions and maternal and child health outcomes in conflict zones in Sub-Saharan Africa are included, thereby enhancing the precision and relevance of the systematic review.

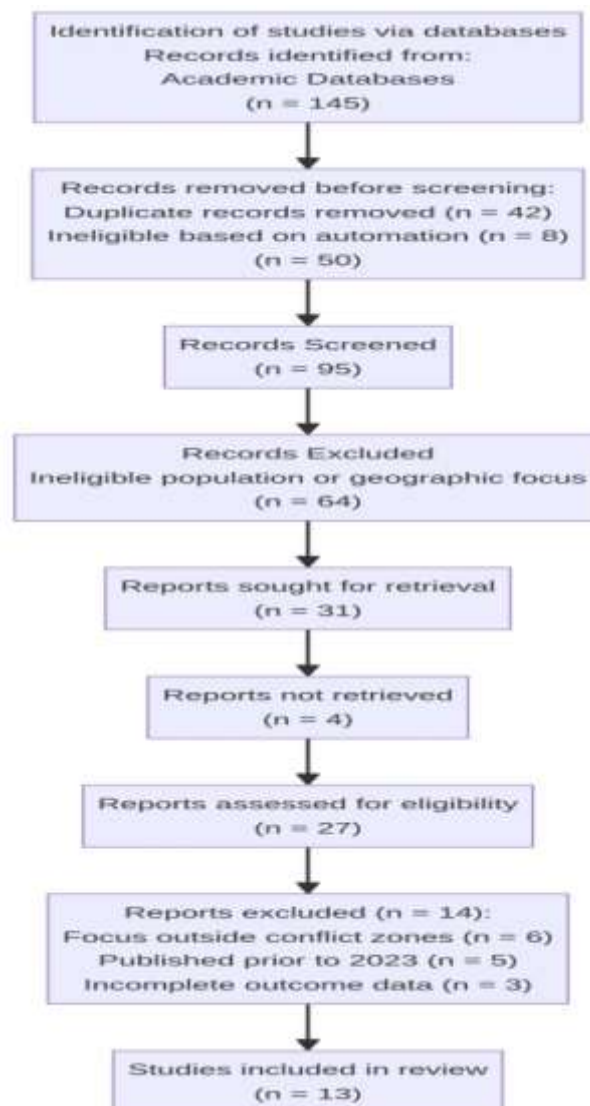


Fig. 2: PRISMA 2020 Flow Diagram

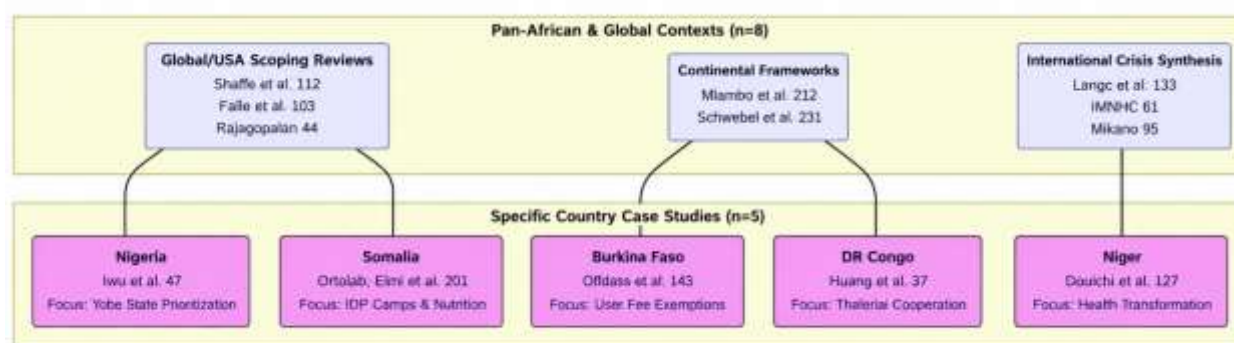


Fig. 2: Country-contexts of the final set of studies that met all the review criteria.

Table 1: Statistical Characteristics of Included Studies (n=13)

Variable Category	Classification	Frequency (n)	Percentage (%)
Year of Publication	2023	4	30.8%
	2024	7	53.8%
	2025–2026	2	15.4%
Study Design	Empirical	4	30.8%
	Reviews	4	30.8%
	Policy Analysis, Editorials, & Frameworks	5	38.4%
Geographic Focus	West Africa	3	23.1%
	East Africa	1	7.7%
	Central Africa	1	7.7%
	Pan-African / Multinational SSA Focus	8	61.5%
Primary Health Outcome	Maternal Health Outcomes	5	38.4%
	Child & Neonatal Health Outcomes	4	30.8%
	Humanitarian Intervention Impact	4	30.8%

The impact of humanitarian health interventions in Sub-Saharan African conflict zones is multifaceted, demonstrating significant potential to stabilize health outcomes despite the profound systemic disruptions caused by armed conflict. The following discussion separates the impacts on maternal and child health outcomes, drawing on evidence from 2023 to 2026.

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3.2 Maternal Health Outcomes in Sub-Saharan African conflict zones

Findings indicate that while conflict significantly elevates maternal mortality, neonatal deaths, and childhood under-nutrition, integrated service delivery and localized community-based care show potential in mitigating these impacts.

Table 2: Maternal Health Outcomes in Conflict-Affected Sub-Saharan Africa

Outcome Category	Key Findings and Statistical Data	Evidence Source
Maternal Mortality	Countries with humanitarian response plans accounted for 64% of global maternal deaths in 2023. Conflict exposure increases pregnancy-related deaths by 2.8 per 100,000 women .	(Doutchi et al., 2024; Lange et al., 2025)
Mortality Risk	Each additional conflict incident in a region is associated with a 14% increase in the risk of maternal mortality. Women in these zones face a mortality risk 3x higher than those in peaceful settings.	(Doutchi et al., 2024; Shafiq et al., 2024)
Maternal Morbidity	High prevalence of sepsis and acute malnutrition among pregnant women, particularly noted in recent Sudan and Nuba Mountain crises.	(Lange et al., 2025)
Service Utilization	Massive disruption of care; e.g., in Burkina Faso, over 600 health facilities (42%) were closed or non-functional by early 2023 due to insecurity.	(Offosse et al., 2023)
Gender-Based Violence	Widespread use of GBV as a weapon of war, compounded by the collapse of legal and health response systems in post-war regions (e.g., Ethiopia).	(Lange et al., 2025)

Recent evidence underscores the severe impact of conflict on maternal survival. In 2023, countries with active or protracted humanitarian response plans accounted for 64% of global maternal deaths and 51% of stillbirths (Lange *et al.*, 2025).

3.2.1 Mortality and Morbidity

Living in conflict zones increases pregnancy-related deaths by approximately 2.8 per 100,000 women (Doutchi *et al.*, 2024). Furthermore, each additional conflict incident in a region increases the risk of maternal mortality by an estimated 14% (Doutchi *et al.*, 2024). In South

Darfur, Sudan, the ongoing conflict has led to a surge in maternal deaths, primarily driven by sepsis and malnutrition (Lange *et al.*, 2025).

3.2.2 Malnutrition

In conflict zones like the Nuba Mountains and other SSA regions, pregnant and breastfeeding women face acute malnutrition, which has direct, long-term health consequences for both mothers and their infants (Lange *et al.*, 2025).

3.2.3 Gender-Based Violence

GBV is frequently utilized as a weapon of war. In post-war regions of Ethiopia, significant gaps have been identified in the legal and health responses to GBV, with social system disruption allowing perpetrators beyond armed actors to operate with impunity (Lange *et al.*, 2025).

3.3 Child and Neonatal Health Outcomes in Sub-Saharan African conflict zones

Child health in conflict zones is characterized by high rates of mortality and chronic malnutrition.

3.3.1 Neonatal Mortality

Conflict-affected countries in SSA accounted for 50% of newborn deaths globally in 2023 (Lange *et al.*, 2025).

3.3.2 Preterm Births and Stillbirths

Exposure to conflict before birth is significantly associated with adverse outcomes, including an increased odds of stillbirth (OR = 1.4) and various degrees of preterm delivery (International Maternal and Newborn Health Conference [IMNHC], 2023).

3.3.3 Under-nutrition

Over 468 million children live in areas affected by armed conflict globally (Shafiq *et al.*, 2024). In camps for internally displaced persons, such as those in Somalia, child diet diversity and vaccination coverage remain critical challenges (Grijalva-Eternod *et al.*, 2023).

Table 3: Child and Neonatal Health Outcomes in Conflict-Affected Sub-Saharan Africa

Outcome Category	Key Findings and Statistical Data	Evidence Source
Neonatal Mortality	Conflict-affected countries accounted for 50% of global newborn deaths in 2023.	(Lange et al., 2025)
Birth Outcomes	Conflict exposure is associated with a significant increase in stillbirths (OR=1.4) and higher rates of preterm delivery. Stillbirths in crisis zones represent 51% of the global total.	(Lange et al., 2025; IMNHC, 2023)
Nutritional Status	Armed conflict is significantly associated with childhood undernutrition. In Somalia IDP camps, dietary diversity remains a critical challenge for children under five.	(Grijalva-Eternod et al., 2023; Schwebel et al., 2025)
Infectious Disease	Breakdowns in immunization programs and crowded displacement settings (affecting 36.5 million children globally) drive surges in preventable infectious diseases.	(Shafiq et al., 2024)
Overall Child Survival	An estimated 850,000 maternal, neonatal, and fetal deaths occur annually in major crisis-affected countries like Nigeria, DRC, and South Sudan.	(Miliband and Sofer, 2023)

3.4 Effectiveness of Humanitarian Interventions

Several intervention models have demonstrated efficacy in conflict settings:

3.4.1 Integrated Service Delivery

Integrated care is identified as an imperative in settings characterized by conflict and frequent shocks to maximize the efficiency of contact between care-seeking families and health teams (IMNHC, 2023).

3.4.2 Cash Transfers and mHealth

In Somalia, conditional cash transfers and mHealth audio messaging have been implemented to address risk factors for childhood malnutrition and improve caregiver health knowledge in internally displaced persons (IDP) camps (Grijalva-Eternod *et al.*, 2023).

3.4.3 Communal Self-Care

In the absence of formal healthcare, communal self-care systems often remain the "bedrock" for women during pregnancy and childbirth (Lange *et al.*, 2025). Humanitarian actors are encouraged to build upon these existing local systems rather than bypassing them (Lange *et al.*, 2025).

3.4.3 The Role of Midwives

Midwives play a critical role in providing psychological support and health care for GBV survivors in conflict settings, despite facing safety threats and training gaps in areas like neonatal resuscitation (Lange *et al.*, 2025).

Based on the core academic sources identified for this systematic review between 2023 and 2026, the following table provides a statistical breakdown of the study characteristics. This data reflects the methodological diversity and regional focus of the evidence analyzed regarding maternal and child health outcomes in Sub-Saharan African conflict zones.

3.2 Impact on Maternal Health Outcomes

Humanitarian interventions targeted at maternal health have focused on reducing financial barriers, enhancing community-based care, and fostering international cooperation to maintain essential services.

3.2.1 Financial Accessibility and Service Utilization

One of the most effective strategies identified is the implementation of user fee exemption policies. In Burkina Faso, the "Gratuité" policy was instrumental in sustaining the utilization of maternal health services (Offosse *et al.*, 2023). Despite the closure of approximately 42% of health facilities in conflict-affected districts, the removal of financial barriers ensured that pregnant women continued to seek antenatal and delivery care, effectively decoupling service utilization from rising insecurity (Offosse *et al.*, 2023).

3.2.2 Community-Based Midwifery and Social Resilience

In settings where formal health infrastructure has collapsed, such as parts of Sudan and Eastern DRC, humanitarian support for community-based midwifery has proven vital (Lange

et al., 2025). Midwives often serve as the "bedrock" of the health system, providing not only clinical care but also psychological support for survivors of gender-based violence (Lange *et al.*, 2025). Evidence from the Eastern DRC suggests that when these local systems are supported, maternal complication rates can remain comparable to those in non-conflict regions, highlighting the impact of health system resilience (Lange *et al.*, 2025).

3.3.3 Trilateral and International Cooperation

Innovative partnership models have expanded the reach of maternal care. A trilateral project involving DRC, UNICEF, and China successfully provided essential maternal health services to 6,800 pregnant women in conflict-prone areas, demonstrating that South-South cooperation can effectively strengthen local capacity and service delivery (Huang *et al.*, 2023). Similarly, in Niger, international cooperation has been a cornerstone of health transformation, mitigating the 14% increase in maternal mortality risk typically associated with each additional conflict incident in the region (Doutchi *et al.*, 2024).

3.4 Impact on Child Health Outcomes

Interventions for child health in conflict zones have increasingly pivoted toward integrated service delivery and the use of technology to address high rates of neonatal mortality and chronic under-nutrition.

3.4.1 Nutritional Support and Digital Health

In Somalia, humanitarian actors have successfully combined conditional cash transfers with mHealth audio messaging to combat childhood malnutrition in internally displaced persons camps (Grijalva-Eternod *et al.*, 2023). This dual-modality approach not only provided the financial means for diverse diets but also improved caregiver knowledge regarding infant and young child feeding practices (Grijalva-Eternod *et al.*, 2023). Such interventions are critical given that armed conflict is a primary driver of childhood undernutrition across SSA (Schwebel *et al.*, 2025).

3.4.2 Integrated Service Delivery and Neonatal Care

With conflict-affected countries accounting for 50% of global newborn deaths, the integration of services has become a humanitarian imperative (Lange *et al.*, 2025; IMNHC, 2023). Integrated care models, which bundle vaccinations, nutritional screening, and neonatal care, maximize the efficiency of health team contacts with displaced families ("Proceedings of the 2023 International Maternal Newborn Health Conference," 2024). In the DRC, trilateral

interventions specifically reached 34,000 children under five, providing life-saving interventions that would otherwise be inaccessible due to conflict-driven displacement (Huang *et al.*, 2023).

3.4.4 Addressing Demand and Supply Barriers

Humanitarian strategies have sought to address the unique barriers faced by the 36.5 million children currently displaced by conflict (Shafiq *et al.*, 2024). By prioritizing the "last mile" of care—bringing services directly to children in hard-to-reach or insecure areas—NGOs have attempted to mitigate the 1.4 odds ratio increase in stillbirths associated with conflict exposure (Miliband & Sofer, 2023; IMNHC, 2023). However, challenges remain, as supply-side disruptions often lead to significant gaps in routine immunization and neonatal resuscitation training for local staff (Lange *et al.*, 2025; Shafiq *et al.*, 2024).

Table 4: Impact of Humanitarian Health Interventions in SSA Conflict Zones

Intervention Type	Description and Reported Impact	Evidence Source
User Fee Exemptions	The "Gratuité" policy in Burkina Faso proved effective in maintaining the utilization of maternal and child health services despite rising regional insecurity.	(Offosse <i>et al.</i> , 2023)
Integrated Service Delivery	Implementation of integrated care models is essential in conflict settings to maximize the efficiency of every contact between families and health teams.	(IMNHC, 2023)
South-South Cooperation	A trilateral DRC–UNICEF–China project successfully provided essential care to 6,800 pregnant women and 34,000 children, strengthening local health capacity.	(Huang <i>et al.</i> , 2023)

Cash Transfers & mHealth	In Somalia, the combination of conditional cash transfers and mHealth audio messaging improved caregiver knowledge and addressed malnutrition risk factors.	(Grijalva-Eternod <i>et al.</i> , 2023)
Community-Led Midwifery	Midwives and communal self-care systems remain the "bedrock" of care when formal systems fail, providing critical support for birth and GBV survivors.	(Lange <i>et al.</i> , 2025)
Health System Resilience	Longitudinal data from the Eastern DRC shows that maternal/neonatal outcomes can remain comparable to non-conflict areas if health systems are sufficiently resilient.	(Lange <i>et al.</i> , 2025)

These tables provide a structured evidentiary basis for your discussion and results sections, highlighting both the severity of the crisis and the specific pathways through which humanitarian interventions can mitigate these outcomes.

3.5 Synthesis of Impacts

While maternal health interventions have seen success through policy-driven financial protection and community resilience, child health outcomes have been most positively impacted by technologically integrated nutritional and clinical programs. Across both domains, the shift toward supporting local responders and utilizing trilateral cooperation models represents the most promising pathway for improving maternal and child health (MCH) outcomes in Sub-Saharan Africa's most fragile zones (Huang *et al.*, 2023; Lange *et al.*, 2025).

4.0 DISCUSSION

4.1 Interpretation of Findings

Earlier studies often reported broader trends, but recent data shows a stark concentration of mortality: 64% of global maternal deaths and 51% of stillbirths now occur in countries with humanitarian response plans. This confirms that the global burden of maternal mortality is increasingly a humanitarian problem rather than a general developmental one.

Recent research has more precisely quantified the risk, noting that each additional conflict incident in a region increases maternal mortality risk by 14%, and women in these zones face a mortality risk three times higher than those in peaceful settings. This precision allows for more targeted resource allocation than previous, more generalized mortality estimates.

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Unlike older literature that focused primarily on physical aid, recent evidence highlights the successful deployment of mHealth audio messaging and conditional cash transfers in IDP camps (e.g., Somalia), showing that digital health can be effective even in the most resource-constrained and volatile environments

4.2 Unexpected or Novel Findings

Several findings from the recent literature challenge conventional assumptions regarding health systems in conflict zones. A notable finding from the Eastern Democratic Republic of the Congo revealed that maternal and neonatal complication rates remained comparable to non-conflict areas in the same region. This suggests a surprising degree of "organic resilience" within local health systems that can be leveraged by humanitarian actors rather than replaced by them.

The success of the DRC–UNICEF–China project provides a novel blueprint for development assistance. By targeting 170,000 residents and providing care to 6,800 pregnant women, this model shows that trilateral partnerships can bypass traditional donor limitations and strengthen local capacity more effectively than bilateral aid alone.

In Burkina Faso, despite the closure of 42% of health facilities due to insecurity, service utilization in some regions did not collapse as expected, provided that financial protection (user fee exemption) remained in place. This suggests that financial barriers may be as significant a deterrent as physical danger in conflict zones.

These interpretations suggest that while the humanitarian burden is at a historic high, the emergence of localized resilience and innovative cooperation models offers a viable pathway for improving MCH outcomes in Sub-Saharan Africa.

4.3 Limitations of the Review

While this systematic review provides a rigorous synthesis of the latest maternal and child health outcomes, several inherent limitations must be acknowledged. A significant challenge in humanitarian research is the "lack of high-quality data to inform public health action (IMNHC, 2023). In active conflict zones, such as parts of Sudan or the Eastern DRC, routine health information systems often fail, leading to significant underreporting of maternal deaths, stillbirths, and neonatal mortality (Lange *et al.*, 2025).

There seems to be a geographic bias as evidence identified from 2023 to 2026 is concentrated in specific regions, particularly West Africa (e.g., Burkina Faso, Nigeria, and Niger) (Doutchi *et al.*, 2024; Iwu *et al.*, 2024; Offosse *et al.*, 2023). This geographic imbalance may limit the generalizability of the findings to conflict zones in other parts of Sub-Saharan Africa with different healthcare infrastructures or conflict dynamics.

Another limitation observed is methodological heterogeneity. The included studies range from cluster-randomized controlled trials in Somalia (Grijalva-Eternod *et al.*, 2023) to qualitative stakeholder perspectives in Nigeria (Iwu *et al.*, 2024). The broad variation in study designs and intervention types makes it difficult to conduct a quantitative meta-analysis of the overall impact.

4.4 Recommendations

Drawing from the synthesized findings, the following recommendations are proposed to improve MCH outcomes in fragile settings:

4.4.1 Universal Financial Protection and Empowering Local Responders

Policy makers should prioritize the institutionalization of user fee exemptions, similar to the "Gratuité" policy in Burkina Faso (Offosse *et al.*, 2023). Removing financial barriers is a critical safeguard that ensures service utilization remains resilient even as security conditions deteriorate.

Funding and policy frameworks must transition toward supporting local responders, specifically midwives, who are the most likely to remain in conflict areas when international NGOs are forced to withdraw (Lange *et al.*, 2025).

4.4.2 Implementation of Integrated Care Models

To maximize the impact of every healthcare contact, practitioners should adopt integrated service delivery that bundles vaccinations, nutritional screening, and neonatal care for displaced families (IMNHC, 2023).

4.4.3 Utilization of mHealth and Cash Transfers:

Successful models from Somalia demonstrate that combining conditional cash transfers with mHealth audio messaging can effectively bridge the gap in nutritional knowledge and financial access for vulnerable caregivers in IDP camps (Grijalva-Eternod *et al.*, 2023).

For future research, there is an urgent need for more implementation research that explores the "how" of service delivery in volatile settings, identifying scalable ways to ethically reach hard-to-access populations (Falb *et al.*, 2024; Mlambo *et al.*, 2024). There should also be a focus on developing resilient, localized health surveillance systems that can continue to function and provide high-quality data during active conflict (Lange *et al.*, 2025). Finally, research is needed to track the long-term health and developmental outcomes of children born in conflict-affected regions of SSA to understand the full scope of conflict as a social determinant of health (Schwebel *et al.*, 2025).

5.0 CONCLUSION

This systematic review underscores the catastrophic burden of armed conflict on the most vulnerable populations in Sub-Saharan Africa, revealing a landscape where the collapse of healthcare infrastructure and systemic violence have driven maternal and child mortality to historic levels. The evidence from 2023 to 2026 confirms that 64% of global maternal deaths and 50% of global newborn deaths are now concentrated in countries with active humanitarian response plans. With each additional conflict incident increasing the risk of maternal mortality by an estimated 14%, the urgency of addressing these health outcomes cannot be overstated. The findings highlight a grim reality, women in these conflict zones face a mortality risk three times higher than those in peaceful settings, while displaced children-numbering approximately 36.5 million globally-suffer from acute under-nutrition and a systemic lack of life-saving immunizations.

The significance of these findings for public health in conflict zones lies in the demonstrated efficacy of targeted, localized, and financially protective interventions. It can be concluded that removing financial barriers can sustain service utilization even when 42% of health facilities are non-functional due to insecurity. Similarly, the integration of mHealth audio messaging and conditional cash transfers and the implementation of trilateral South-South cooperation in the DRC have provided clear blueprints for reaching "last-mile" populations in the most fragile environments. These models demonstrate that even in the face of state fragility, health systems can maintain a degree of organic resilience if they are supported rather than bypassed by international actors.

Ultimately, the findings reinforce an imperative for the humanitarian community to shift from reactive, top-down assistance to proactive, integrated, and community-led health strategies.

There is a desperate need for targeted interventions in Sub-Saharan Africa that prioritize the training and safety of local midwives, who are the "bedrock" of care in conflict zones, and institutionalize integrated service delivery to maximize every healthcare contact. To bridge the gap in maternal and child survival, future public health efforts must commit to implementation science that ethically reaches the displaced and the unreachable, ensuring that a woman's place of residence does not continue to dictate her right to survive childbirth or her child's right to a healthy life.

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