

A Policy Discussion on Maternity Waiting Home in Zambia to Achieve Its Vision 2030 on Maternal and Perinatal Mortality

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Abstract: Maternal and child health, with a focus on perinatal health, remains an area of focus for developing countries. Zambia has identified maternal and child health as an area of concentration in its 2030 vision agenda, with the goal of achieving less than 180 maternal deaths per 100, 000 live births by 2030. So far, interventions executed by the government include improving birthing space and providing higher quality services such as emergency obstetric care, post-abortion care and encouraging community level advocacy by safe motherhood action groups. However, the high perinatal and maternal mortality rate in Zambia is associated with the low accessibility to quality obstetric care as a result of delays in decision to seek care, delays in reaching care centers, and delays in receiving care. Consequently, Maternal Waiting Homes (MWH) has been identified as a tool for reducing maternal and perinatal mortality. It is currently being used in Zambia but there is limited data on the operation and its impact. The evidence on MWH for this paper was based on the aggregate review of numerous studies. These identified MWH as an effective, equitable and cost-effective intervention but without concrete evidence of its acceptance. The effectiveness is highly dependent on its strength to promptly identify and refer high-risk pregnant women to skilled obstetric care. In addition, other non-medical interventions including strengthening family planning program at the grassroots level and integration of community mobilization in the MWH program with service quality improvement were recognized as successful. However, the utilization of MWHS has been low in most low- and middle-income countries (LMICs). This paper also describes potential implications of the MWHs on the political, economic, and social and development sectors of the country. In all, it recommends the upgrading and strengthening of MWH and its health system in Zambia, alongside integration of other suggested interventions.

Keywords: Effectiveness of MWHs, Equity of MWHs, Safety and Acceptability of MWHs, MWH in Developing Countries, Interventions for Reducing Perinatal Mortality, Maternal and Perinatal Mortality

1. Introduction

The high maternal and perinatal deaths remain a public health concern in Africa. In 1996, the maternal mortality

ratio [MMR] in Zambia was 649 per 100,000 live births, with steady rise over the years, to a total of 729 per 100,000 births in 2002. For unknown reason, in 2011, the MMR in Zambia had fallen to 591 per 100,000 [1]; and declined more to 224

per 100,000 in 2015 [2, 3]. Despite the various interventions by the Zambian government to reduce the country's maternal and perinatal mortality, it remains a cause for concern [4]. Recorded barriers to access to quality healthcare for pregnant women in rural areas include poor road networks, traditional and cultural factors, high cost of healthcare, limited availability of conducive transportation to healthcare facilities [4–7] and ineffective health educational sessions on a myriad of topics such as new-born care or family planning while women are awaiting childbirth [8].

Zambia's Vision for 2030 defines a new MMR target of 180/100,000 live births by 2030 [4, 9]. The question is - *What is the best intervention for Zambia to achieve her vision 2030?*

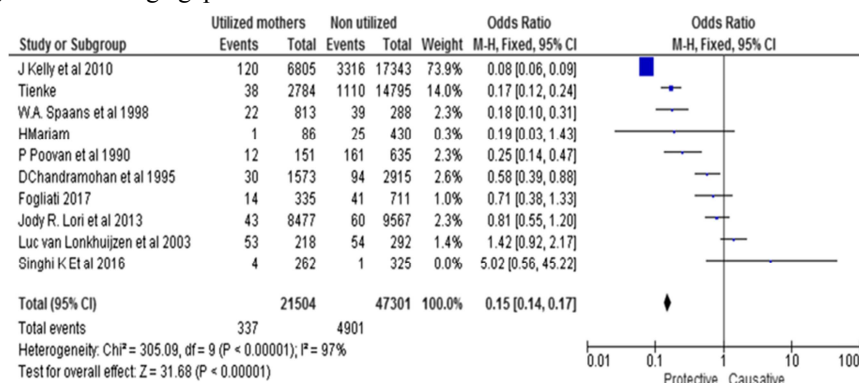
Maternal Waiting Home (MWH), a residential facility stationed close to a licensed healthcare center mainly for 3rd trimester or high-risk pregnant women to easily access skilled obstetric care, has long been identified as a tool to reduce maternal and neonatal mortality. In a few of these homes, additional emphasis is placed on education and counseling regarding pregnancy, delivery and care of the new-born infant and family [10] In Zambia, MWHs have been in existence for about two decades, however, the general quality is low and there is no specific policy or plan to scale up [8, 11–13].

Despite the presence and use of MWHs in Zambia, there is inadequate monitoring and evaluation data on the operation and impact of MWH [4]. This paper is designed to provide a comprehensive summary of current evidence (s) on MWH and recommendations for achieving the maternal and perinatal targets of Zambia's 2030 vision. It is important to evaluate the effectiveness of MWHs towards reducing maternal and perinatal mortality. The lack of information on the usefulness of MWHs makes it essential to evaluate the effectiveness of MWHs for its advancement as a policy for improving the lives of pregnant women. The study contributes to bridging this knowledge gap.

2. Method

Search for literature was conducted by selecting published, unpublished and grey articles and reports from sources such as Google Scholar and PubMed and Research Gate. Using relevant synonyms and keywords (such as *Effectiveness of MWHs, Equity of MWHs, Safety and Acceptability of MWHs, MWH in Developing Countries OR Middle and Low income Countries, Interventions for reducing Perinatal Mortality, Maternal Mortality*), articles, journal and reports were searched and reviewed. The studies focused on equity, safety and acceptability of MWHs were appraised using the GRADE CERQual. Using the GRADE CERQual the literature reviewed was appraised based on the following indicators: Country/Target Population, Study design/Sample Size, Methodological limitations, Relevance, Coherence Data Adequacy, Study Outcome, and Explanation of Judgments. Materials used for the study were reports, articles and journals available in English language only.

The reviewer designed a data extraction matrix which was used to extract relevant information such as the topic, abstracts and objectives of the study, author, publication date, journal title, source, components addressing the topic, summary of key findings, summary of the document, summary of key findings related to intervention of alternative pathways to reduction of maternal and perinatal mortality in developed and developing countries, summary of implication of findings. This provided the information needed to proceed with the review. The reviewer read through the reports and articles, extracting relevant information pertaining to the study. Reviewing of alternative successful interventions, a twenty-year gap (1995 to 2015) was used to measure the impact of interventions (reported and unreported) on the reduction of maternal mortality.



Source: Bekele, Dadi and Tesfaye 2019 [14].

Figure 1. Meta-analysis of association between MWHs and perinatal mortality.

3. Results: Analysis of Evidence for a MWH Policy Implementation

To accurately assess the effectiveness of MWHs, there was need to review data on MWHs. However, there are no MWH

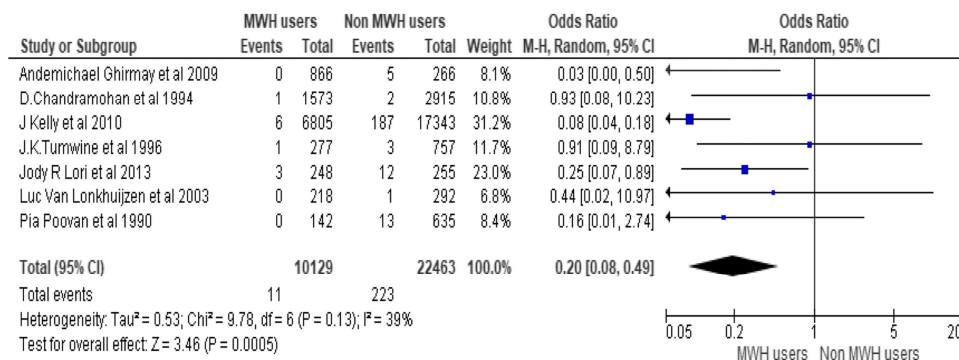
effectiveness statistics from Zambia. A systematic review and meta-analysis of all studies on MWH effectiveness in Africa has been conducted and reported in three publications (2019, 2018 and 2009) [14, 15]. Therefore, the intention of conducting systematic review and meta-analysis would not be necessary, and the two recent publications will be

appraised in this paper. The two appraised publications and their results are:

The most recent review done in 2019 generated the best existing evidences on MWHs utilization and its impact on perinatal mortality [PNM] in Africa [14]. This paper pooled a total of 10 studies and concluded that MWH users have about 82.5% lower risk of having PNM compared to non-MWH users (OR (95% CI)=0.175 (0.155, 0.196), $Q=260.5$, $p<0.0001$) [14]. However, half of these studies' results presented an association between MWH and PNM; meaning that, MWH users are less likely to have PNM compared to non-MWH users. Note, there is a high variability among these 5 studies. Lastly, a study identified MWH effectiveness

to be dependent on its strength to promptly identify and refer high-risk pregnant women to an emergency obstetric care (EmOC) [16].

While the review conducted in 2018 synthesized the best available evidence on effectiveness of maternity waiting homes on the reduction of maternal mortality and stillbirth in developing countries [15]. It identified seven quality studies with a total of 32,592 participants with cases of maternal death among MWH users and non-MWH users. The study concluded that MWH users are 80% less likely to die compared to the non-MWH users (OR = 0.20, 95% CI (0.08, 0.49), $I^2 = 39\%$, ($P < 0.00001$) [15].



Source: Dadi et. al 2018 [15].

Figure 2. Meta-analysis of association between MWHs and maternal mortality.

Both studies created strong cases/arguments on the need for MWHs in reducing maternal and perinatal mortality respectively. Both studies identified the utilization of MWHs as being low. However, both studies conducted their search on observational studies only. Perhaps, if intervention studies had been included, efficacy of MWHs on maternal and perinatal mortality could have been more predictable with provision of its high-quality data. Therefore, it is advised that more intervention studies should be conducted, so as to measure the closest effectiveness value of MWHs on maternal and perinatal mortality [14]. Additionally, both studies were limited to African countries only, which make it generalizable to other African countries with similar context.

Countries around the world have developed various strategies to reduce maternal and perinatal mortality [17–25]. Most of these strategies are medically inclined with little focus on the non-medical interventions. Based on review, a number of non-medical interventions, proven to have reduced maternal mortality in different countries have been identified and it is highly recommended. These include strengthening family planning programs at the grassroots level; incorporating traditional birth attendants in local health programs and lastly, integrating community mobilization in the MWH program. These recommended interventions have shown a high success rate in MMR reduction in low-income setting countries like Bangladesh, Nepal [17, 21], developing countries with a lesser GDP per capital compared to Zambia [26–28].

A recent study has shown a low cost per maternal life

saved in a rural setting in Liberia. This implies that there is a need to up-scale maternal waiting homes to meet the needs of reducing maternal and perinatal mortality [29]. While a group of American and Australian researchers identifies family planning as the most cost effective strategy to reducing maternal and perinatal mortality due to fact that strategies to increase contraceptive options for limiting and spacing do not require the same level of infrastructure as improving intrapartum care [30]. A 2013 study also recommended early intensive efforts to improve family planning, accompanied by a systematic stepwise effort to scale-up intrapartum and emergency obstetrical care. This would reduce maternal deaths by 75% [31]. In all, it should be noted while considering strategies for reducing maternal and perinatal mortality in Zambia, cost effectiveness should be measured to ensure that they do not plunge citizens and the economy into debt or below poverty line. Considering the cost of upgrading and building maternal waiting homes, even though MWHs have been identified as an effective strategy to reducing maternal and perinatal mortality, MWHs might not be as cost effective as other interventions.

All selected studies on the safety, equity and acceptability of MWHs highlighted socio-demographic characteristics of women attending MWHs. This study found that mothers who lived 15 km or greater from a health care facility were more likely to use a MWH than women who lived within 9.5–9.9 km from a health care facility. This implies that distance to the health care facility is a major factor for accessing MWHs [8]. A good strategy would be to establish MWHs for women

who do not live near health care facilities for adequate patient care.

In spite of the compilation of a list of safety indicators [32], only few studies on limited indicators (quality and adequacy of infrastructure and equipment at the MWHs such as beds, kitchen utensils, electricity and others) were available, and rated MWHs to be unsafe and have poor quality in the studied African countries [11, 12, 33]. These studies were not conducted on all the MWHs in the country, so, it is possible that other MWHs are better equipped and have good structures than the ones reported [11].

4. Discussion

Creating access to high-quality vital obstetric services for women in the perinatal period is essential; however, this is not very feasible in most rural areas of low- and middle-income countries (LMICs). MWHs help to bridge this gap and bring these services to those who need it the most. It is pertinent to evaluate the effectiveness of the MWHs to ascertain its continued practice and ways to improve them.

This paper was aimed at appraising the intended use and scale-up of MWHs to achieve Zambia's Vision 2030 on maternal and child health. The highlighted studies depict the reduction in risk of maternal and perinatal mortality in MWHs users compared to the non-users. The most recent study illustrated the association between MWHs and PNM, revealing that MWHs users were less likely to have PNM than non-users of MWH [14]. However, it is important to note that this study had a moderate heterogeneity, and this may have affected the results. A significant number of the reviewed papers documented the low utilization of MWHs [8, 12, 14, 15, 34]. A proposed recommendation of this study in tackling this low utilization of MWH is supported with the findings from the individual studies conducted in Laos, Peru and Kenya [35–37]. Importantly, the study in Laos noted the interest of users of MWHs in microcredit and handicraft opportunities during their stay in MWHs [35]. This should serve as an attractant and boost utilization of the MWHs. In addition to the study in Laos, the study conducted in Peru [37] acknowledged a culturally oriented MWH operation as a strategy to increase uptake of obstetric services by delivering services that were culturally appropriate. The outcome of the strategy was an increase in utilization of these provided services, a 94% increase in use four years after implementation of a culturally-oriented MWH. This involved MWH services being delivered in the local language; and also health professionals being trained to be culturally sensitive. With no doubt, this will increase the utilization of MWH and also reduce waiting and consultation time for users.

Clearly, there is weak evidence that MWH users are less likely to have PNM in comparison to non-users of MWHs. However, this paper requests for the stronger involvement of researchers, government and non-governmental bodies to support more interventional studies to be conducted for proper recommendation of MWH policy. No relevant studies

have been done on the global health impact of MWH. Below are some suggested potential impacts:

Political impact: Successful implementation and high impact of MWH could result to the subsequent government adopting the strategy in their agenda, with credits given to the present government. This will enable sustainability and viability of the MWHs in Zambia as well as drive political will behind it.

Economic impact: A healthy and vibrant population contributes significantly to the economy. After delivery, women can naturally integrate back into the society and carry on with their businesses. This will have ripple positive effects on the economy, such as increasing revenue, compared to when a woman dies as a result of complications during pregnancy or childbirth. A study in Nigeria has also showed that high maternal mortality levels have reduced the life expectancy in reproductive age women who are key population in a country's sustainable development [38]. Also, the MWHs could be a source to generate revenue through small lodging allowance paid by the women. This could supplement allocations used to sustain the MWHs.

Social impact: Indirect risk of MWHs could be on the nuclear or extended family. The partner, not being able to take care of the children (due to work or other reasons), might employ the services of family members which could lead to negligence and abuse of the children and increase in societal violence if not properly managed. Proper planning should be made, especially for households with minors, to arrange appropriate care givers when needed.

Population Health and Development Impact: Proper health education on maternal and perinatal care, and family planning given to women in the MWH, will improve the care of children in terms of good nutrition, proper education and overall wellbeing, and indirectly have a positive impact on the community health and education in Zambia. This increase in community education on maternal and child health will enhance the utilization of MWHs and improve population health of the community. Family planning can help stabilize the growth of the country which will in turn have positive effects on the development of the economy and social and human capital development. Lastly, MWHs has a significant contribution to the bridging of high-risk pregnant women living far away from health centers.

5. Conclusion

Maternity Waiting Homes (MWHs) have been identified and utilized as a tool for reducing maternal and perinatal mortality for Zambia's Vision 2030. This paper analyzed the association between MWHs and maternal and perinatal mortality rates in LMIC settings to establish its effectiveness. However, due to the lack of strong evidence in this subject matter, this paper has not been able to conclude definitively that MWHs lead to an associated reduction in maternal deaths.

The enabling factors for the successful implementation and impact of MWHs (including community and stakeholder

involvement, standardized guidelines for MWH admission and care, availability of needed resources, regular quality training of MWH workforce, a strong referral system, incorporation of other successful interventions in MMR reduction and lastly scaling-up both the MWHs and EmOC centers) were identified and are strongly recommended.

6. Recommendation for MWH in Zambia

This study has identified areas (including resources implication and sources) that can be strengthened in the Zambian health system for the aforementioned goal to be achieved.

Table 1. Table of Recommendations.

Building Blocks	Internal	Local District Health Parastatal	External
	Ministry of Health (National)		
6.1. Governance			
Systems: Strengthened management system	Institutionalize Maternal Waiting Home as a department or agency.	Provide hospitality services at the maternal waiting facilities.	
Referral system	Institutionalize a strong referral system between MWHs, Primary and secondary health facilities [16].	Provide incentives for MWHs to encourage and strengthen the referral system.	Provide education on maternal and perinatal care to communities and spouses of pregnant and postpartum women.
Regulations: Guidelines	Develop standard guidelines stating requirements for admission at MWHs. [34]	Implement guidelines as developed by the MoH.	
6.2. Financial Equity	Subsidize price for registering and accessing services at MWHs.	Ensure services at facilities are delivered at subsidized rate.	
Health Insurance	Enforce registration of pregnant women on health insurance scheme.	Grant some level of financial autonomy to the management of MWHs.	Community involvement in implementation.
6.3. Service Delivery			
Quality of service	Modernize MWHs by ensuring the provision of standard equipment [10] for use in delivering quality and safe healthcare to patients.	Provide essential materials at the MWHs, such as, lights, windows and window nets, cooking utensils, beds, mattresses, televisions, indoor games, etc. [11, 40]	
Performance Management System	Develop a performance management system to monitor performance of MWHs [2]	Monthly collation and dissemination of performance outcomes based on set indicators	Partnerships with donor agencies, philanthropic organizations and foundations and to build/renovate MWHs and provide living essentials.
Cultural factor	Take into cognizance cultural factors when designing/upgrading method of service deliveries in MWHs [39]	MWH workers should be conversant with cultural practices specific/unique to different Districts and localities.	
6.4. Health workforce			
Recruitment	Develop guidelines for recruitment of MWHs.[34]	Recruit workers based on set criteria by the Ministry of Health	Partner with donor agencies to provide training/retraining for MWH workers
Training	Develop training curriculum for MWH workers	Ensure training and retraining of MWH workers periodically	
6.5. Health Information System [HIS]	Develop a centralized electronic health information system to collect, store and manage patients' information	Collect patient information at facility level based on set information as approved by Ministry of Health	

Source: Drawn by Author from numerous studies results.

The assumption is MWHs, while cost-effective if well managed, community policed and financially supported, can independently recognize high-risk pregnant women with prompt referral to the closest EmOC [14, 16]. Thus, the reformed MWH should be implemented through a proposed evaluation plan and a simplified theory of change, aiming at the following:

1. To regularly assess the infrastructure, equipment and supply for the establishment of MWHs through routine data and questionnaires.
2. Consider policies, management and finances through questionnaires, hospital records, audit reports, performance management reports.
3. Evaluate service capabilities and limitation and linkages with healthcare facilities through a functional referral system through routine data, antenatal care (ANC)

cards, face-to-face interviews.

4. Conduct assessment of service quality through birth and death registers, focus discussion groups [FDGs] and interviews.
5. Gauge the recruitment process through face-to-face interviews and recruitment history.
6. Measure the fidelity of the MWHs through FDGs and questionnaires.
7. Assess the reach of MWHs through FDGs.
8. Evaluate alternative pathways/mechanism through household surveys.
9. Foster interactions through questionnaires, FDGs and face-to-face interviews.

Following this plan, this should enhance the functionality of MWHs to the optimum and improve maternal and child health outcomes for Zambia's Vision 2030.

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