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Lessons learnt and best practices in scaling up an emergency transportation system to tackle maternal and neonatal mortality: a qualitative study of key stakeholders in Shinyanga, Tanzania

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ABSTRACT

Objective This study aimed to document lessons learnt and best practices for scaling up an innovative emergency transportation system, drawing insights from the m-mama programme implemented in Shinyanga, Tanzania. The m-mama pilot programme was implemented in phases from 2014 to 2016 in two districts and later scaled up to include all districts in Shinyanga region in 2017. The programme employed an emergency transportation system and technical and operational support of the health system to address the three delays leading to maternal and neonatal mortality.

Design Cross-sectional, qualitative research with key healthcare system stakeholders from the national, regional and district levels.

Setting The study was conducted in Kahama and Kishapu districts in Shinyanga, Tanzania. The two districts were selected purposefully to represent the programme implementation districts' rural and urban or semiurban settings.

Participants District, regional and national stakeholders involved in implementing the m-mama pilot programme in Shinyanga were interviewed between February and March 2022.

Results Lessons learnt from implementing the m-mama programme were grouped into four key themes: community engagement, emergency transportation system, government engagement, and challenges and constraints in technical implementation. Stakeholder engagement and collaboration at all levels, community involvement in implementation, adherence to local contexts and effective government partnerships were identified as key drivers for programme success. Coordination, supervision and infrastructure enhancement were crucial in implementing the emergency transportation system.

Conclusions Facilitating community involvement, understanding the local context and adapting to existing structures can enhance programme ownership and utilisation. The government serves as the central coordinator, overseeing resource mobilisation and distribution. A well-executed and coordinated emergency transportation system holds promise in addressing delays and curbing maternal and neonatal mortality. Collaborative knowledge-sharing among implementers is essential for identifying best practices and gaining insights into practical strategies for addressing anticipated challenges.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The study involved key participants from all healthcare system levels to obtain a rich, robust and comprehensive perspective on implementing the m-mama programme.
⇒ As a cross-sectional study, it is limited to a snapshot information collection.
⇒ The study lacks prolonged engagement, which may challenge obtaining an insider perspective of the programme implementation.
⇒ Baseline information for maternal and neonatal emergency and referral care indicators was not collected, which would have provided more insights into the initiative's effectiveness.

INTRODUCTION

Globally, maternal mortality declined by 38% between 2000 and 2017.[1] However, about 810 women die each day due to preventable maternal causes.[2] While the global distribution in maternal mortality varies with regions and contexts, 9 in 10 deaths occur in low-income and middle-income countries (LMICs), and sub-Saharan Africa (SSA) accounts for two-thirds of all deaths.[2 3] The risk of death due to pregnancy and childbirth complications in SSA is between 1 and 37, attributed to health and socioeconomic disadvantages.[4 5] These include various factors delaying women from making decisions to

access and receive antenatal care for safe childbirth and newborn care, and having pre-existing medical conditions worsened by pregnancy.[5–7]

In Tanzania, maternal mortality has remained persistently high, with 432 per 100 000 live births reported in 2014 but a steady increase to 524 per 100 000 live births in 2017. Such an unprecedented rate is unequally distributed between different regions, with the areas in the Lake zone, like the Shinyanga region, reporting a higher burden.[8–10] The region reported higher maternal mortality rates of 635 per 100 000 live births, 449 and 417 per 100 000 live births between 2010, 2015 and 2017, respectively.[10 11]

The three-delay model for seeking maternal care has been used to explain the underlying causes of maternal mortality.[12–14] In this model, the first delay is from the household or personal level, from the onset of symptoms at home to when the decision to seek care is made by either a woman, her family or both. The second delay is attributed to factors impeding access to health facilities, including available infrastructures and means of transport from when the decision to seek care is made. The third delay is receiving appropriate care at the facility level, including the availability of skilled human resources, equipment and referral system from admission until adequate treatment begins.[12 15] Addressing such delays calls for tailored interventions that may need to be modified from one context to another.

The m-mama programme is a comprehensive emergency transportation system (EmTs) tackling the three delays. It began as a pilot intervention in 2013 in Mwanza and Shinyanga regions, aiming to address broad, systemic challenges through a coordinated horizontal programme approach that extends from the community and lower-level health facilities to the hospital level. Analysis of the programme implementation showed that the transportation system could potentially reduce maternal and neonatal deaths through public and private partnership arrangements using digital technology.[16–18] Evidence on lessons and best practices from such innovative approaches has not been systematically reported for scaling up. This study therefore aimed to document lessons learnt and best practices with respect to the scaling up of the m-mama programme.

METHODS

Study design and setting

This qualitative study was conducted between February and March 2022 in the Kahama and Kishapu districts of the Shinyanga region in the Northern Lake zone of Tanzania. The two districts are among the six programme implementation districts for the m-mama programme in the region. The two districts were chosen purposefully to represent the programme implementation districts' rural and urban or semiurban settings. Kahama municipality represented the semiurban setting and had a supervisory role over two rural districts (Msalala and Ushetu) where the programme was implemented. Kishapu district was selected to represent the rural setting as it had an established dispatch centre. Shinyanga region has a total population of 1 534 808 people, according to the 2012 national census.[19]

In comparison with the national maternal death ratio of 432 per 100 000 live births, Shinyanga reported a higher maternal mortality rate of 635 per 100 000 live births and 449 per 100 000 live births between 2010 and 2015.[10] The total fertility rate for the Shinyanga region is 7.2, a higher rate than the national average of 5.2 per woman. Despite the high burden of maternal mortality in Shinyanga, the region had only 13 public ambulance vehicles used to transport emergency cases, not enough to cater to such a fast-growing population.

Description of the m-mama programme

The m-mama programme was implemented in two phases through close collaboration with the Ministry of Health (MoH) and the President's Office–Regional Administration and Local Government (PO-RALG), selected health facility governing bodies, development partners and communities. Vodafone Foundation, Touch Foundation, Pathfinder International, and respective Regional and Council Health Management Teams (RHMT/CHMT) were the key implementers of the m-mama programme.[20 21] At the core of the m-mama programme was an essential component known as the EmTs and technical and operational support of the health system. The EmTs was designed in collaboration with the MoH, the Reproductive and Child Health Services (RCHS) division and the RHMT. The system used technology to remotely triage patients and dispatch an ambulance or community driver to transfer them to the health facility. It aimed to address the second delay in reaching care directly, addressing the transportation challenge. The programmes addressed the second and third delays through health systems strengthening and community education initiatives. Community Care Groups (CCGs) were encouraged to encourage women to seek healthcare and ensure women receive high-quality care upon reaching the appropriate health facility. Pathfinder International provided technical and operational support, including establishing CCGs to influence community health-seeking behaviours and help improve the quality of maternal, newborn and child health (MNCH) care at Basic Emergency Obstetrics and Neonatal Care (BEmONC).[21] This was done in dispensaries, health centres and hospital levels by building the capacity of health providers, providing equipment, and improving the detection and referral of high-risk and complicated pregnancies. Touch Foundation made clinical and structural capacity at the health centres and district hospital level to provide Comprehensive Emergency Obstetrics and Neonatal Care (CEmONC) services. Together, the activities supported a continuum of care for women to access MNCH services at all levels of the healthcare system.

The programme worked in two phases to strengthen the health system and improve the capacity of healthcare workers.[22] On-site phase I implementation started in Sengerema District Council (DC) and Buchosa DC (previously referred to jointly as Sengerema DC) in 2014, followed by Shinyanga Municipal Council in 2016. It focused on proof of concept and identifying cost-effective maternal and neonatal mortality solutions. Phase II of the programme started in 2017, expanded m-mama into the entire Shinyanga region with a population of approximately 1.9 million, and focused on the ownership and sustainability of the system by local government authorities.

Study population

The study population consisted of eight representatives from the national, regional and district government stakeholders. The sample size was determined based on an understanding of the programme implementation of the government stakeholders included in this study. This included members from the Directorate of Health, Nutrition, and Social Welfare at PO-RALG, community-based coordinators, facility-based coordinators and medical officers. Facility-based coordinators oversee health programme activities at facilities, while community-based coordinators, selected from community health workers (CHWs), manage activities at the community level, including raising awareness about the m-mama programme.

Sampling and recruitment of study participants

Participants were recruited using purposeful selection to obtain information-rich individuals based on their involvement during the programme's implementation. The recruitment process focused on getting ideas from the experts regarding implementing m-mama.[23]

Data collection

Trained research assistants collected data through key informant interviews (KIIs). Before data collection, the tools were pretested during validation training and a standardised semistructured interview for data collection. The interview guide is provided as an online supplemental file. Participants were asked about what worked well during implementation that should be replicated to scale up the challenges and how they can be solved, and what was not implemented during the programme that should be incorporated to ensure scale-up and success nationally. A total of eight KIIs were conducted in either English or Swahili based on the preferred language, and they were audio-recorded with the permission of the study participants. To maintain neutrality, researchers applied the principle of bracketing to ensure that pre-understanding information does not influence the data.[24] The programme was evaluated by a team of researchers who were not part of the programme. Field notes as a reflective diary were maintained and reviewed during the analysis to enhance reliability. A private and quiet place was sought to ensure maximum privacy and clear recording.

Data management and analysis

The audio-recorded KIIs were transcribed verbatim. Transcription was done immediately within 24 hours of data collection to allow for any clarifications and assess data saturation. Despite the predetermination of the sample size, data saturation was reached. Two researchers reviewed the transcripts to confirm the quality and correctness of the transcription in line with the audio. Following the thematic analysis, codes were manually drawn from the data after rereading several transcripts and were shared with the whole team before actual coding was done. The five stages in doing thematic analysis, as described by Braun and Clarke (2014), were adhered to establish meaningful patterns in the data. These include familiarisation with the data, generating initial codes, searching for themes among codes, reviewing themes and presenting the results. The coding also involved identifying the stock quotes used to illustrate the various themes of study interest.

Conceptual framework

The conceptual framework designed for scaling up the m-mama programme nationally exhibits a robust alignment with the Consolidated Framework for Implementation Research (CFIR), a well-established and comprehensive framework in the domain of implementation science.[25 26] CFIR provides a structured approach to understanding the intricate factors that influence the successful implementation of interventions within complex healthcare settings. This alignment is crucial for a deeper understanding of the m-mama programme's potential to be effectively implemented and scaled nationally. The alignment with the CFIR framework offers a structured lens through which to analyse the various components of the conceptual framework for scaling up the m-mama programme. By considering the inner setting, intervention characteristics and outer setting factors within the CFIR framework, stakeholders can comprehensively identify contextual factors, barriers and facilitators influencing successful implementation and scaling. It provides a foundation for strategic decision-making and targeted interventions to enhance the programme's effectiveness and maximise its impact nationally on maternal and neonatal health.

The first pillar of the conceptual framework, community engagement, aligns with CFIR's emphasis on the inner setting. In the context of m-mama, community engagement is central to the programme's success. The EmTs aligns with CFIR's consideration of intervention characteristics. This framework component correlates with CFIR's focus on intervention characteristics, such as adaptability, complexity and relative advantage. The third pillar, government engagement, resonates with the outer setting and the process components within CFIR. Advocating for government involvement and policies is akin to

addressing the outer setting and recognising the external environment's influence on the implementation process.

Patient and public involvement

Patients were not involved in this study; our participants were government officials working at the Department of Health at the national, regional and district levels. As key players, they participated in the conception and blueprint of the programme in their areas of jurisdiction. Findings from the programme evaluation have been shared with them through formal dissemination.

RESULTS

We conducted this study to document lessons learnt and best practices for scaling up the m-mama programme nationally and in other limited-resource settings in LMICs. We learnt that community engagement, smooth operation of the EmTs and government engagement are crucial in scaling up the m-mama programme. The programme's implementation also faced various challenges and employed different solutions to solve them. One of the vital programme strategies was to engage stakeholders at all levels of the programme implementation to enable ownership of the programme and lead to the success and attainment of the desired outcomes. Community engagement from planning through implementation was essential to promote the utilisation of the programme as members were aware of the available services. Working within the local context was also reported to smoothen the programme's implementation. It was crucial to coordinate the programme activities, particularly the EmTs. The collaboration between the government and partners was reported to play an essential role in securing adequate funds to provide sufficient compensation to drivers and CHWs. Coordination and supportive supervision of the programme were highlighted as the government's responsibility. Implementing the EmTs should also include improving health service provision in the healthcare facilities and infrastructures.

Community engagement and ownership of the programme

The involvement of the local community is akin to understanding the inner setting within CFIR, encompassing the role of individuals and the prevailing culture within the community. Recognising community engagement as a determinant aligns with CFIR's acknowledgement of how community involvement significantly influences the effectiveness of implementation within this inner setting. Participants acknowledged that engaging the community, who are the programme's beneficiaries from the beginning, helps in the successful implementation of the programme. During the programme's implementation, the community owned the programme and was involved in every step, working closely with the district government. This succeeded in winning the community's dedication to implementing the programme. One participant stated:

> In this program, the community-owned it, when you speak with dedicated drivers, you can hear from them their dedication, you will feel the ownership in them of the program.

Understanding the local context and working within the existing structures are essential to smoothen the programme's operation.

> We should work as much as possible within the district structures, the transport officers, the local police, local village leaders, etc, they know their village, they know their district, they know much better who owns cars and how to get contact with those people and try to recruit them. Working with the existing local structures is probably the best way to recruit drivers. (medical officer)

For the people to benefit and use the system, they should be well informed on what the programme offers and how to access it. For example, educating the community about pregnancy danger signs enabled them to call and seek early medical care. Media platforms like television, community radio and billboards are important in spreading awareness about the programme. Toll-free numbers available 24 hours for reporting on maternal or neonatal emergencies were provided to pregnant women and CHWs and were displayed in public areas at RCHS clinics and ward offices for easy and quick access.

Operationalisation of the EmTs

Establishing a robust EmTs is critical to the m-mama programme. The need to tailor the transportation system to suit the community's specific needs corresponds with CFIR's concept of intervention adaptation, highlighting the importance of aligning interventions with the unique characteristics of the target population. Focusing on the programme's core, EmTs is necessary to ensure utilisation and desired outcomes are attained. Through the m-mama programme, proper coordination of EmTs has shown the potential to prevent maternal and infant mortality. The use of community taxis, in addition to ambulances, has helped to improve maternal and child health services. One participant reported:

> …This project contributed a lot to reducing the causes due to delays in getting services from the community to facilities and low-level to high-level facilities. When you look at the data from Shinyanga, there is a drop in maternal deaths. Because we attended MPDSR [maternal and perinatal death surveillance and response] meeting, and you can see that after analysis, the deaths and complications due to lack of transport reduced compared to what the situation before the project.
>
> If you look at the pace at which we have reduced maternal mortality and infant mortality under this m-mama program, everything is possible. We fail to do what we can to reduce it simply because we do not

have the resources, just because we do not have proper transportation. (medical officer)

Strengthening the transportation system must go hand in hand with enhancing the information and communication system, as it plays a significant part. The infrastructure needs to be repaired and upgraded as required to improve access. The flow of information facilitates coordination.

> The coordination of the triage system, a call would be made to the receiving facility and it will be notified that we have an emergency of a certain kind you need to have tools in place to help the patient and the facility will have to get ready for that particular emergency. Unlike in the past when emergencies would go to the facilities unprepared. (facility-based coordinator)

An emergency preparedness plan is necessary as emergencies are prone to occur at any given time; there is, therefore, a need to develop and adopt the EmTs. It is crucial to have smooth coordination of the EmTs to prevent infant and maternal mortality. Coordination involves the availability of adequate resources, particularly funds, to reimburse the taxi drivers and other employed staff. An officer reported:

> The things we have learned are that, just the coordination, which I said, the coordination of the emergency transport system, that if properly done, we can prevent maternal mortality. In the sense of coordination, there is one center that controls these transport systems.

To offer services, there must be enough trained human resources. As there is currently a shortage of human resources for the healthcare industry, it is advised that dispatch centres designate specialised personnel whose job is to answer and coordinate calls. Additionally, the government must allocate more skilled human resources to the health sector to eliminate the need for referrals.

Government engagement and collaboration

Working with the appropriate stakeholders is required to have a smooth programme implementation. Emphasising policy development and advocacy aligns with CFIR's focus on implementation, encompassing policy-related factors and engagement with external stakeholders. This alignment underscores the significance of engaging with the broader environment and streamlining policies for effective scaling and sustainability of the m-mama programme. Strong leadership and advocacy in the government are needed to help show other government officials how impactful the programme can be. The main government implementers, PO-RALG and the MoH, need to harmonise their understanding of the programme.

> We had to look for a government team that will believe in the system, that which could see the benefits of the program and would be willing to do as per the program requirements and who would commit both in terms of the financials paying the community drivers and proper allocation of resources through the RHMT and CHMT. Now, it's all about getting the belief in the system from both TAMISEMI and MoH stakeholders. (medical officer)

Different government levels should be involved in all processes, including planning, from village to district. The government should fully commit to sustaining the programme and set appropriate budgets. A government official stated:

> We need to set adequate budgets; the government needs to think broadly to increase budgets so that we can pay these drivers who help us survive. Without a budget to pay these drivers, we are doing nothing. The drivers will drop, we will go back there, we will be waiting for one car to go this way, we will be late, deaths will increase, and we will go back there.

Running the programme needs a lot of resources, particularly funds. The government oversees the programme's management and maintenance and ensures adequate funding is available and used effectively. An officer reported:

> The program reaching the community needs a lot of funds, things like hiring a P.A. [public address] system for public announcements, making announcements on community radios, you need to fund these.

The government is in charge of ensuring the infrastructure is in good working order, including the roads that help prevent auto accidents, permit easy access to and from facilities, and lessen car damage. To manage all necessary operations, supplies like car maintenance and gas should be removed from the pool, and each department should have its transport officer and supplies. Funds should also be allocated to purchase ambulances equipped to facilitate referrals. Remuneration for the taxi drivers must be provided timely for enthusiasm and readiness to offer the service as required. As reported by a medical officer:

> Timely payment is critical for the sustainability of the program, if drivers are not paid on time as m-mama team was doing, they lose motivation and drop out.

It is recommended that the municipality should provide supportive oversight of CHWs, as well as the provision of health education and referral services. To identify problems and discover solutions, holding frequent meetings with stakeholders, including drivers, dispatchers, programme focal persons, directors, Regional administrative secretary (RAS) and District medical officers (DMOs) is advised. Also, providing community leaders with communication tools like phones to help them connect with healthcare facilities as necessary is given importance.

Challenges and constraints in technical implementation of the programme

The programme's implementation faced several challenges at the level of the facilities, the EmTs and physical infrastructures. The healthcare facilities faced a shortage of human resources and supplies. A shortage of human resources was also reported as a challenge during the programme's implementation. This was attributed to the transfer of staff to other areas, creating a vacuum of skilled service provision and understaffing, attributed to work overload. It was recommended that more staff need to be hired to the facilities and ensure adequate service provision.

> There is also understaffing in both health facilities and at the dispatch centre. The dispatch centre needs to have a healthcare worker 24/7. The same healthcare workers are supposed to work in both the dispatch center and the facility. (medical officer)

> Training of BEmONC was provided in many health facilities, however, CEmONC cannot be trained to everyone… so if someone who was trained is transferred and comes someone who was not trained, you find that the services provided might not be sufficient. (facility coordinator)

The EmTs faced challenges regarding availability and durability of the ambulances and community taxis. As one participant reported:

> Challenges of using ambulances- first of all, they are few and do not fit the purpose, second, breakdown ambulances need repairs which are not timely, third the ambulance could be handling another emergency when it is needed. Sometimes you may find an ambulance is unavailable because it has transported the patient to another region, that's why we need a back-up transportation system.

In certain areas within the Shinyanga region, poor roads pose significant challenges, especially during the rainy seasons. Due to their small size, the local community taxis often struggle to navigate these poorly maintained roads. To address this issue, a dual approach has been adopted. In some parts, villagers have been encouraged to engage in road repair initiatives actively, fostering a strong sense of community involvement and ownership. In other areas, the services of a professional contractor have been enlisted to undertake the necessary road repairs.

> When ambulances are not working you opt to go for community taxis. The challenge with community taxis is that they are not four-wheel drive like land cruisers when the roads are rough especially during the rainy season, they fail to transport the patients effectively. (district medical officer)

To optimise the impact of the healthcare programme established in government facilities, the government must increase its financial support by allocating additional funds for equipment procurement and hiring trained healthcare providers. The programme's success is attributed to active community engagement and ownership, exemplified by the community's initiative in road repairs. Encouraging and sustaining this sense of community involvement is vital. The government should explore and leverage local resources to enhance programme implementation and scalability, creating a more efficient and autonomous healthcare system that benefits the entire community.

DISCUSSION

In this study, we aimed to document the lessons learnt and best practices for scaling up the m-mama health programmes in Shinyanga, Tanzania. Community engagement from conception to implementation is vital to promote usage and ownership of the programme. The government is the primary coordinator of the programme responsible for the mobilisation of resources and coordination and supportive supervision. Effectively applied and aligned with the local context, the EmTs can potentially reduce maternal and neonatal mortality. Operating within the existing structures is critical to ensure the intervention runs smoothly.

Engaging the community from the inception of m-mama enabled the successful implementation of the programme and will facilitate its smooth scale-up to other areas in the country. Community engagement has been emphasised in various initiatives, including section four of the Alma Ata Declaration, which emphasised the individuals' and community's engagement in processing affecting health needs and decisions. The section also declares that individuals have the right and duty to participate collectively in the planning and implementing of programmes for their health.[27 28] Community commitment in Tanzania can be traced back as early as 2001 when communities, through their village councils and other stakeholders, participated fully in building tricycles and engaging in socioeconomic activities to develop funds necessary to improve their means of communication.[29] Promoting acceptability and usage of maternal and neonatal health services requires community involvement from planning through implementation. The public should be fully informed of, involved in and allowed to voice their opinions on available services. For maximum efficiency, it is crucial to understand the local context and work within the existing structures.

Similar programmes in LMICs demonstrated similar outcomes when communities were fully involved.[30–32] Such effects may be through improving health behaviours and outcomes, providing more acceptable, people-centred services and empowering communities. Community-based health interventions enhance access and utilisation of maternal and newborn services, ensuring that the services are organised to respond to their health needs, values and preferences.[33] Thus, the involvement of the communities from planning to implementation is crucial

in promoting acceptance, utilisation, and improved maternal and newborn health.[34 35] Community awareness and empowerment are important for community members to participate in decision-making in complementing scale-up efforts.[36 37]

The government has a crucial role in maintaining its citizens' well-being. From this study, the government is emphasised to be fully committed to scaling up the programme and setting appropriate budgets for it. Strong governance provides suitable conditions to facilitate policies and financial commitments by the government authority, donors and development partners. This is important to champion the country's maternal and newborn health targets country-wise, ensuring continuous progress and equitably delivering necessary care to end preventable maternal deaths. The government is in charge of supportive monitoring and central coordination.

To secure funding for the drivers' and CHWs' remuneration, health education provision, better transportation and equipped CEmONC facilities with ambulances to expedite referrals are necessary. Free maternal services in Enugu state, Nigeria's primary and secondary health facilities succeeded through a joint fund between the local authority and the state government. This was an addition to other programmes such as safe motherhood, family planning, and integrated maternal and child health.[38 39] Beyond policy, the government has a key role in providing supportive financial mechanisms and supportive supervision to ensure the quality of the services and achieve the national goals in maternal and newborn health.

A well-coordinated EmTs using community taxis can potentially reduce maternal and newborn mortality in a limited setting. Improved means of communication and physical infrastructures facilitate the utilisation of the service. When EmTs is used in areas with few or no ambulances, it serves as an emergency preparedness plan to tackle the second and third delays. In LMICs, non-motorised vehicles, including bicycles, tricycles, modified tricycles and canoes, have been elaborated to provide emergency transport to facilities.[29 40] Currently, ambulances and community taxis are used as means of transportation. The drivers are trained to triage patients, properly handle obstetric emergencies and offer communication to nearby facilities. With limited ambulances, community taxis are vital in ensuring timely access to health facilities and emergency referrals. While local taxis can help ease transportation, there is still a need for traditional ambulances to be fully equipped to offer emergency services. The availability and use of community taxis go along with improved communications in terms of phone calls and wireless communication, as seen in other countries. In rural Pakistan in 2012, community taxis were employed to address the ambulance gap after at least four drivers in each community underwent obstetric emergency training. The cost was kept affordable to simplify access, and drivers only requested fuel costs covered by the local community.[41 42] Even with improved roads, some remote areas still have rough terrain roads, which make transportation difficult. The climate and weather conditions also influence the quality of the streets, and different conditions, such as heavy rain, cause hindrances to transportation. The inflation of fuel and maintenance of the vehicles are expected challenges to these interventions, and involved stakeholders need to set strategies to address them. Findings from this pilot study can inform the scaling up of the m-mama programme in other districts in Tanzania with high burdens of maternal and neonatal morbidity and other settings with similar contexts. The study employed triangulation of participants who serve different roles and positions in the healthcare system to obtain a rich, robust and comprehensive perspective on implementing m-mama. As a cross-sectional study, it is limited to a snapshot information collection. It lacks prolonged engagement, which may challenge obtaining an insider perspective of the programme implementation. Moreover, we did not collect baseline information for maternal and neonatal emergency and referral care indicators, which would have provided more insights into the initiative's effectiveness.

CONCLUSION

Community engagement, comprehension of the local context and operating within the existing structure promote ownership and utilisation of the programme. The government is the primary coordinator of the programme and is responsible for the mobilisation and distribution of resources. An effective, applied and coordinated EmTs has the potential to tackle second and third delays and reduce maternal and neonatal mortality. Implementers should trade experiences to recognise best practices and better understand how to address anticipated difficulties.

Twitter Harrieth Peter Ndumwa @Harrieth Peter.

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Competing interests None declared.

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Patient consent for publication Not required.

Ethics approval Ethical approval was granted by the Muhimbili University of Health and Allied Sciences Research and Ethics Committee (MUHAS-REC-11-2021-885). Permission to collect data from the Shinyanga region was given by the PO-RALG authority and the office of the regional medical officer in Shinyanga.

Informed consent was obtained from participants before data collection. Participants were assured of privacy, confidentiality and anonymity throughout the study. The data obtained from this programme evaluation were kept strictly confidential and accessible to only the named investigators and have been stored on password-protected computers.

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Data availability statement Data are available upon reasonable request. Data may be obtained from a third party and are not publicly available. The dataset contains identifying qualitative information and therefore cannot be made publicly available. However, data will be made available on a reasonable request. Request to access data can be made to the chairperson, Institutional Review Board, Muhimbili University of Health and Allied Sciences (drp@muhas.ac.tz).

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