

Improving access to maternal health services in Zambia through community based emergency transport schemes

EVIDENCE BRIEF

“Even if they come at 1am, they will find the bicycle ambulance here. We saw the maternal danger signs and know that the bicycle ambulances have reduced maternal deaths. What motivates me is that I can reduce maternal deaths in my community.”

Global evidence indicates that implementing transport strategies alongside other interventions may contribute up to an 80% reduction in maternal deaths.¹ The above quotation, from an emergency transport scheme (ETS) rider in Serenje District, Zambia gives an indication of the public health gains that can be achieved by providing community- based and managed transport systems in remote, rural areas. In Zambia, these schemes are filling an important gap in the health referral system, and are helping to reduce maternal and newborn mortality and morbidity.

Summary

- In Zambia, community-based and managed emergency transport schemes (ETS) have helped to reduce maternal and newborn mortality in rural areas.
- ETS works best when implemented as part of a broader demand-side intervention that addresses all household and community-level barriers to timely use of maternal and newborn health (MNH) services simultaneously.
- Government is responsible for ensuring that the referral gap between communities and first level referral facilities is addressed, and that specific, budgeted activities are implemented in order to achieve this. These are key health policy issues for Zambia.



Bicycle ambulance with SMAG volunteers and ETS riders, Mkushi District

Background and context

Zambia's maternal mortality ratio (MMR) is 398, which equates to four women dying for every 1,000 live births. Inability to reach health care, or delays in reaching care, contribute significantly to this situation. In rural Zambia, transport availability is poor, cost can be a major barrier to use, and the terrain can be very challenging. Although most of the rural population lives less than eight kilometres from a health centre, the average distance to a health facility equipped for safe delivery is more than 15 kilometres.² Distance contributes to low institutional delivery rates: currently only 56% of rural births take place at a health facility (CSO, MOH and ICF, 2014).³ Many pregnant women end up walking to health facilities, are pushed on a bicycle, or are discouraged from travelling, citing lack of transport as a major constraint. Such delays can worsen the clinical severity of cases, particularly where complications exist.

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The MORE Mobilising Access to Maternal Health Services in Zambia (MORE MAMaZ) programme was established in 2014 to support the government's efforts to improve MNH access and outcomes. Funded by the UK charity Comic Relief, MORE MAMaZ is building on, and scaling up the work of a predecessor programme, MAMaZ (2010-2013), funded with UK aid from the UK government. MORE MAMaZ's support for rural transport was integrated with other interventions and activities (see Box).

Strategy

MORE MAMaZ used non-motorised Intermediate Modes of Transport (IMTs) to improve rural communities' physical access to health facilities. IMTs provided a good fit with the challenging terrain and prevailing resource constraints. They also offered various sustainability benefits. Non motorised transport has a significantly lower capital cost than motorised transport as well as lower on-going running costs. Based on a comprehensive needs assessment, bicycle ambulances (BAs) were placed in four districts in Central and Muchinga Provinces where the terrain was suitable for bicycle use and where there was a strong local bicycle culture. In Mongu, in contrast, the deep sand and the frequency of flooding meant that ox carts were more appropriate.

A comprehensive needs assessment looked at distance, terrain, the socio-cultural and economic context, and the accessibility of spare parts. These findings informed the ETS design.

MORE MAMaZ consortium partner, Disacare, an organisation with a long track record of designing and constructing mobility aids in Zambia, constructed 102 bicycle ambulances in Lusaka. The BAs were then transported by road to communities. In Mongu, 18 ox carts were constructed by a local supplier using a traditional design that was adapted to suit the vehicle's intended purpose. For example, a canopy was added to provide pregnant women with privacy. 36 oxen were purchased to pull the carts. With both forms of ETS, all components were designed so that they could be serviced or repaired using local supplies and suppliers. In the programme

districts, ETS vehicles supplied by MORE MAMaZ were operational alongside ETS vehicles supplied by the predecessor programme, MAMaZ. The latter included 58 bicycle ambulances and 11 ox carts, giving a total of 191 ETS vehicles in the five main intervention districts.

MORE MAMaZ avoided relying on spare parts that were not easily available locally or expensive, to prolong the life of the ETS vehicles

ETS riders and custodians of the vehicles were nominated by the community. The wider community was engaged in discussions on how to access the vehicles, and on community stewardship of ETS. A key message was that the community was entirely responsible for its maintenance, safe-keeping and responsible usage.



Mother with baby born following use of the ETS, Mkushi District

MORE MAMaZ approach

- A **community empowerment process** facilitated by trained Safe Motherhood Action Group volunteers (SMAGs) mobilised communities around a maternal and newborn health agenda.
- **Community systems** provided safety nets for pregnant and newly delivered women, addressing barriers of access, affordability and lack of social support. This included ETS, savings schemes, food banks, child-care schemes, and mothers' helpers.
- A **community monitoring system** generated data on the maternal and newborn health activities and changes in the community.
- A system of **mentoring and coaching support** helped communities make the transition from increased awareness to sustained change.

¹ Murray and Pearson, 2006, 'Maternal referral systems in developing countries: Current knowledge and future research needs', **Social Science and Medicine**, Vol. 62 pp: 2205-2215.

² Gabrysch S, Simushi V, Campbell OM, 2011, 'Availability and distribution of, and geographic access to, emergency obstetric care in Zambia', **Int J Gynaecol Obstet**, 114: pp. 174-9.

³ Central Statistical Office (CSO) [Zambia], Ministry of Health (MOH) [Zambia], and ICF International, 2014, **Zambia Demographic and Health Survey 2013-14**. Rockville, Maryland, USA: Central Statistical Office, Ministry of Health, and ICF International.



Ox cart and shelter in Mongu District

Community-based training of ETS riders covered the following topics: the role of an ETS volunteer, how to record trips in logbooks, safe lifting and handling of mothers during transportation, patient confidentiality, basic principles of ETS maintenance, and the practical dismantling and assembling of the vehicles. Neighbourhood Health Committees (NHCs) conducted demonstration rides to introduce the ETS to the community. Newly trained riders were tasked with selecting and orienting additional riders to expand the pool of riders. ETS riders and SMAG volunteers were encouraged to work in a team so that the riders were aware of which women were close to delivery and where they lived, and the SMAG volunteers knew where and how to contact the riders. District Health Management Teams (DHMTs) were involved in all aspects of the ETS, from the initial needs assessment work, to on-going monitoring, and review activities. This was to ensure institutionalisation of ETS into the day-to-day work of the DHMTs.

Unit costs for a bicycle ambulance were GBP 543 (K7,600). Unit costs for an ox cart (including oxen) were GBP 1,113 (K15,583). Exchange rate is GBP1= K14.

Results

MORE MAMaZ intervention communities were able to access transport when previously it had not been available, affordable or was very slow. Feedback from communities and DHMTs suggested that ETS was highly valued by the communities. ETS riders had increased social status in their communities and the community-managed approach helped to strengthen community cohesion.

Between September 2014 and June 2016, 3,647 pregnant women in five intervention districts benefitted from the ETS. Of the women using the ETS, 91% were normal deliveries and 9% had a maternal complication. This highlights rural communities' considerable reliance on ETS for both emergencies and non-emergencies. Women were able to rely on ETS '24/7'; 41% of the recorded transfers happened at night. The programme's endline survey found that for mothers in the sample, all those who had a maternal complication survived, while 96% of babies survived.

"[Being an ETS rider] brings me joy as I save not only mothers' but babies' lives. Once I had a sad experience in my family. A family member died due to lack of transport and I have never forgotten. Now we have transport and there are almost no home deliveries."

Josephine Mupeta, Serenje District

ETS was widely used by women in the programme's intervention districts (30%), followed by walking (27%), public transport (16%) and own bicycle or cart (16%). In control districts, the predominant mode of transport was public transport (40%), followed by walking (24%) and own cart or bicycle (17%). In intervention districts, reliance on ETS ranged from 47% of women in Chama to 22% in Serenje and Mkushi.

MORE MAMaZ made a significant contribution to increasing access to and utilisation of essential maternal health services. The percentage of women delivering at a health facility increased from 64% at baseline to 89% at endline, an increase of 25%. Institutional delivery rates in control districts at endline were 78% (11% lower). As the ETS vehicles continue to be used, the number of beneficiaries will improve still further.

'I am very happy that we have the BA in our community. As the head rider, I am committed to transport women any time, any hour, any day. I am a rider for life and nothing will stop me from doing this work'.

ETS rider, Chama district

3,647
pregnant women
benefitted
from the
ETS





Bicycle ambulance in Mkushi District

Lessons learned

- ETS works best when implemented as part of a broader demand creation and community empowerment effort that addresses all demand-side barriers to use of MNH services simultaneously.
- ETS needs to be suitable for the terrain and distances, culturally appropriate for users, and easy and affordable to maintain. A community needs assessment will help to ensure that the choice of ETS vehicle is appropriate and that the scheme as a whole can be managed and sustained.
- It is important to ensure that spare parts are readily available in implementation areas and that production also uses locally accessible parts.
- Working with oxen (or any animal-pulled carts) is challenging. Sourcing and transporting oxen to intervention sites, providing vaccinations and on-going care of livestock need to be considered. If the community management system is weak the chance of failure is high.
- Protective equipment needs to be supplied alongside ETS vehicles. Basic tools for repairs, high visibility vests, rain suits, gum boots, and quality lights so that riders can find their way in the dark are all essential.
- In some areas ETS riders may face challenges travelling at night due to human wildlife conflict. Engaging the Zambian Wildlife Authority to support ETS training and provide on-going support to communities is recommended.
- The on-going operational costs of ETS are manageable if communities fully embrace their stewardship role. A link to saving schemes or income generating activities can support communities' efforts to finance ETS repairs.
- ETS vehicles have a natural 'shelf-life' considering the challenging terrain in which they operate. This is 4-5 years in the case of bicycle ambulances. Government needs to plan for how these vehicles can be replaced over time.

- An ETS audit system that provides real time information to DHMTs about the state of ETS vehicles is needed. This will allow the DHMTs to assist with larger repairs if necessary.

Policy implications

Key implications for policy makers are:

- It is government responsibility to ensure that the referral gap between communities and the facility is addressed and that specific, budgeted activities are implemented in order to achieve this. This needs to be acknowledged in health policy and strategy.
- Replacement costs for ETS vehicles need to be included in national or district health budgets. These investments are cost-effective considering the potential of ETS to help avert many maternal and newborn deaths.
- A focal point is needed within the MOH and in DHMTs for all activities that help strengthen the community health system, including community-based emergency transport systems.
- To avoid procurement of inappropriate ETS vehicles, government departments and development partners should use locally appropriate and evidence-based ETS solutions.

MORE MAMaZ results

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In the MORE MAMaZ intervention sites:

- Institutional delivery rates increased by 25% (from 64% to 89%). The increase in control sites was 16% (from 62% to 78%)
- Early ANC rates (attendance in first trimester) increased by 25% (from 37% to 62%). The increase in control sites was 4% (from 40% to 44%)
- 3,647 women benefitted from ETS in five intervention districts



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