Community Emergency Transport Systems

Using transport to improve access to health services in rural Madagascar

Background

To reduce maternal and neonatal deaths, timely access to skilled care before, during, and after pregnancy is critical. Delays in accessing quality care are a key contributor to maternal and neonatal mortality. Inadequate access to transport is one of the three main delays in accessing health services[1] and can worsen the clinical severity of cases, particularly where complications exist. Implementing transport strategies alongside other interventions may contribute up to an 80 percent reduction in maternal deaths[2]. Maximizing the potential for communities to develop and manage their own emergency transport systems (ETS) that bridge the gap between the community and the health facility is an effective method to increase access and enable government health services to draw on community resources to increase service demand.

MAHEFA Context

Preventable maternal and neonatal deaths in Madagascar are alarmingly high. With a neonatal mortality rate of 22 deaths per 1,000 live births, 64 percent of deaths are due to birth asphyxia, birth trauma, and prematurity. The maternal mortality rate of 240 per 1,000 live births is most often due to postpartum hemorrhages or obstetric fistulas[3]. Timely access to emergency services and skilled birth attendants are significant barriers to reduce mortality. Furthermore, Malagasy women of reproductive age have also noted distance to the nearest health facility and the need for vehicular transport to arrive at the health facility as significant barriers to receive care[4]. There are multiple challenges that influence availability and use of transport in rural areas in Madagascar. Transport availability is often low; and when transport is available, cost is often a major barrier. Moreover, in MAHEFA regions, the mountainous and sandy terrain is challenging to access by motor vehicle and the majority of sites experience reduced access during the rainy season. Forty four percent of *communes* (the smallest territorial division as defined for administrative purposes) in MAHEFA program areas are inaccessible by car or truck for at least four months out of the year and 20 percent are inaccessible for almost half of the year.

The MAHEFA Approach

MAHEFA's ETS approach provided access to locally available and appropriate transport during health emergencies to improve health service access. Because of the variety of terrain encountered in MAHEFA regions, a thorough needs assessment was conducted and findings were used to identify and pilot a range of locally appropriate non-motorized modes of transport including stretchers, bicycle ambulances, canoes, and ox-drawn carts.

MAHEFA also established links between the ETS groups, community health insurance schemes (*mutuelles*) and the eBox (enterprise box) activities to provide other avenues of support and funds for repairs and maintenance. Co-locating ETS and *mutuelles* in the same communities allowed the ETS to receive modest funding from the *mutuelle* to support repair and maintenance of transportation mechanisms. Links to the eBox, a social micro enterprise for bicycle sale and repair that gives five to ten percent of profits to selected local health activities, also provides a source of funds and skills for emergency transport maintenance.

Key Activities

1. Conducted needs assessment. A comprehensive transport needs assessment that included interviews with community members and leaders took place in 2012 and occurred in all of MAHEFA's six regions. Results were analyzed and the ETS concept was designed for the initial three regions.

1. *Thaddeus & Maine (1994) Too far to walk: Maternal mortality in context. Social Science and Medicine, 38(8), 1090-1110*
2. *Murray and Pearson (2006) Maternal referral systems in developing countries: Current knowledge and future research needs. Social Science & Medicine, Vol. 62 pp. 2205-2215*
3. *World Health Organization, Madagascar. 2012*
4. *Institut National de la Statistique (INSTAT) et ICF Macro. 2010. Enquête Démographique et de Santé de Madagascar 2008-2009. Antananarivo, Madagascar: INSTAT et ICF Macro*

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2. Manufactured initial fleet. To design various modes of transport, MAHEFA drew on promising practices in Zambia where bicycle ambulances were piloted extensively and in Afghanistan where wheeled stretchers were used in mountainous areas. For the cycle rickshaw, canoe ambulances, and ox-drawn carts, there was already considerable local knowledge on the design and suitability for the local terrain. Manufacturing was done in collaboration with a Malagasy organization.

3. Conducted pilot activity and evaluated at community level. The pilot was conducted in the Menabe region and later replicated in other MAHEFA regions. The community-level activities are presented in Box 1. After six months of the pilot phase, MAHEFA conducted a review to draw lessons learned and modify the approach including modes of ETS.

Box 1. Steps in establishing community-based ETS

1) *Conduct initial workshop to explain ETS in pre-selected fokontany (collection of villages).* This step was important to assess interest and buy-in and to sensitize communities on the intervention.
2) *Conduct a technical evaluation of the sites.* MAHEFA conducted a technical evaluation for feasibility of ETS, appropriate modes of transportation for specific terrain, and potential ETS management and operation capacity in each region.
3) *Make site selection and community-based ETS activity introduction.* The community selects volunteer drivers and ETS management committee members are formed.
4) *Conduct training for ETS management committee members, supervisors and drivers.* Training contents included overviews of individual roles, repairs and maintenance, danger signs for pregnant women and newborns, and how to interact with health facility staff. The management committees learned to ensure ETS services were available and accessible, to manage relations with the drivers, coordinate repairs, and to manage the link with the community health insurance scheme and, where applicable, with the eBox.
5) *Set cost and user fees.* Guidelines on costing and potential ETS user fees were established so that communities can set their own prices based on demand, distances, and affordability.
6) *Establish reporting systems.* These included logbooks for drivers that were consolidated by the community management committees for aggregation and sent on to the MAHEFA regional teams.

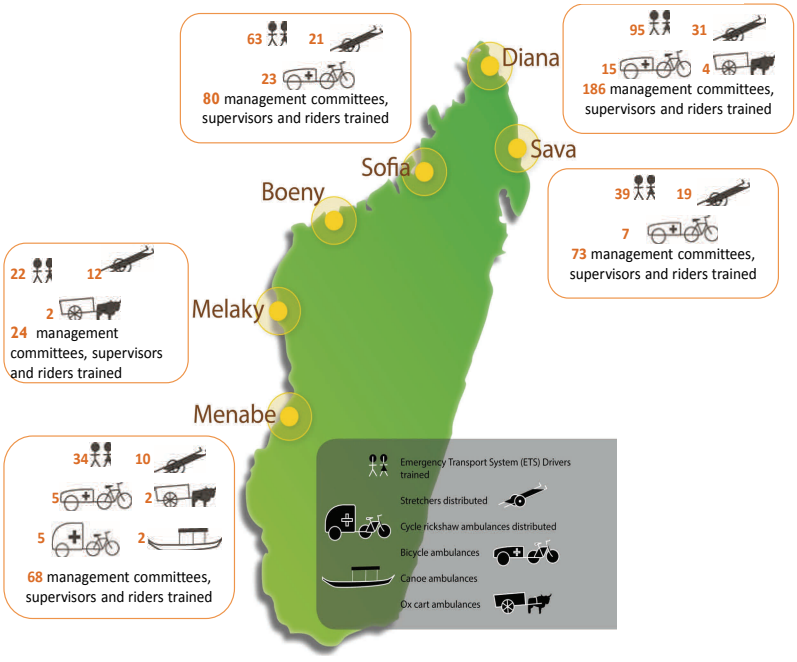
4. Conducted a workshop for construction of emergency transport after pilot. A redesign workshop took place to ensure the quality of subsequent production of modes of ETS; the workshop also served to further build the production of the modes of ETS expertise of local partners.

5. Expanded to other regions. Following the successful pilot in Menabe and implementation of lessons learned the ETS was expanded to four more regions (SAVA and Sofia in 2014 and to DIANA and Melaky in 2015). In 2015 a small number of ox-drawn carts were added in five *communes,* MAHEFA provided communities with the cart while the community provided the oxen.

Results

Figure 1 shows the results of the ETS activities in the MAHEFA Program. The ETS activities were implemented in 11 *communes* covering 132 *fokontany*. Five modes of ETS were provided including119 stretchers with or without wheels, 78 bicycle ambulances, 43 cycle rickshaw ambulances, eight ox-drawn cart ambulances and six pirogue ambulances. Figure 1 also shows that the program has trained 160 members of the ETS management committees and 454 supervisors and riders.

Figure 1. Emergency Transport in MAHEFA Regions[5]



During the life of the program, there were a total of 964 people who were transported by the ETS from their community to the government health facilities or CSBs. Children under five made up 66 percent of those who benefitted from the ETS approach.

Synergies between the *mutuelle* and eBox activities were created to contribute to financial sustainability of the ETS. In 2015, the annual eBox contribution to ETS ranged from 320,000 to 640,000 MGA (100-200 USD); an average repair costs just under 6,400 Ariary (2 USD)

5. Source: Program data as of February 29, 2016

Challenges

Cultural barriers to perception of the emergency transport. Despite a comprehensive needs assessment and sensitization activities, there is still a perception in some MAHEFA areas that bicycle ambulances and stretchers should only be used for carrying the deceased, resulting in low uptake of the ETS.

Sustainability after the program ends. With the exception of the ox-drawn cart ambulance, other modes of ETS were built based on technical specifications by specialized companies who were contracted by MAHEFA. This meant higher costs and a dependence on external constructors for the communities.

Repairs can be a challenge. While the drivers are able to do simple repairs, more complex repairs where a mechanic is needed can be a challenge. In some instances, the drivers have the expertise but there can be affordability issues regarding spare parts.

Data collection. There were challenges with collecting data about trips and making this data meaningful for the communities. These challenges ranged from getting drivers to complete their logbooks to ensuring that driver data was consolidated and shared with different audiences. Additionally, data on the services people received once they were transported to health facilities has not yet been collected.

Box 2. Results of the Qualitative Interviews

MAHEFA team conducted a qualitative interview on ETS in three regions in August and September 2015. A summary of the findings is presented below:

- Travel times reduced during an emergency from two hours on foot to a maximum of one hour and 15 minutes post-ETS innovation.
- Pre-ETS innovation it took between one to three hours to arrange transport. Post-ETS innovation, ETS is available when required.
- Costs have dramatically reduced. Pre-ETS innovation, in Menabe, the cost of using a minibus taxi (if available) was 4,000 MGA (1.25 USD); hiring an ox cart cost around 30,000 MGA (9.40 USD); and a car could cost as much as 100,000 MGA (31.00 USD). In an emergency situation exploitative pricing strategies were often employed resulting in prohibitively expensive prices.
- With the ETS innovation in place, community members pay the following costs:
  - *Mutuelle* members: After paying 1,200 MGA (0.38 USD) per household per year to join the *mutuelle*, member benefits include free ETS use.
  - Non-*mutuelle* members: Community members pay a fee for each use of the ETS, but it rarely exceeds 1,500 MGA (0.50 USD) per trip; this amount is considered affordable.
  - Vulnerable families: The review also found that people were not refused access to the ETS if they could not pay for it at the time of use. Communities know the most vulnerable families, and drivers and management committees were able to exercise flexibility to allow equity of access.

In a context where cost constituted a major barrier to accessing care and where saving time can be the difference between life and death, these results are significant.

Lessons Learned and Recommendations

Conduct a needs assessment. The needs assessment helps ensure that community-based transport solutions are specific to the geography and local context, and help to provide the community perspective and information to build on existing transport mechanisms.

Focus on community engagement. Investing the time to establish community management systems, publicly recognize drivers, and sensitize the community for demand creation is essential to ensure that transport is accessible, volunteer drivers remain motivated, and community members know about the transport. Sensitizing midwives and other community care providers regarding service availability will also help to improve ETS uptake.

Use locally produced modes of ETS. Building local capacity on transport production was an important part of the ETS innovation and promoted local ownership and cultural acceptance. It is important that the community has access to local builders for the modes of ETS, if not at the community-level at least at the regional level. Wherever possible ETS production capacity should be available at the local level.

Plan local solutions for maintenance and repair costs from the onset. Despite low general implementation costs associated with non-motorized transport, there is still a need for repairs and maintenance and for a mechanism to fund these costs. Any program implementing this approach should work with the communities and ETS committee members at inception to identify locally available funding sources to cover the eventual maintenance or repair costs.

Collect data on ETS use and services received by ETS users. In order to know the impact of ETS on access to care and eventual health outcomes it is important to not only record the types of ETS use, but also to record services received by ETS users at CSBs. This data will help communicate the advantages of ETS for future programs.

Emergency transportation can save lives: Testimony from the Menabe Region

In inaccessible areas of the Menabe region, the mortality rate is rising because the transport cost between 20,000 and 40,000 MGA per trip (between 6 and 12 USD), the monthly budget of an average family in rural areas. To remedy this, 43 operating emergency transport volunteers have been equipped and trained by the MAHEFA program to provide emergency transport services to help reduce neonatal and maternal mortality infant.

Sixty-five year old Erinesy, a former military member and now an emergency transport volunteer, drives a bicycle ambulance in Marofototra, Menabe Region. "Since my days in the military, my vocation has always been to serve people. I've transported more than 70 people with my bicycle ambulance — children, pregnant women, and the elderly."

"I like knowing that even at my age, I can still make a difference in my community. This work allows me to save lives and also keeps me physically fit."

Most recently, Erinesy was able to transport a six-month-old child suffering from respiratory problem more than 7 kilometers to the nearest basic health center.

Erinesy with the six-month-old he transported to the basic health center, Menabe region

In the six MAHEFA program regions, a total of 454 supervisors and emergency transport drivers have been trained and continue to serve their community.

Madagascar Community-Based Integrated Health Program (CBIHP), locally known as MAHEFA, was a five-year (2011-2016), USAID-funded community health program that took place across six remote regions in north and north-west Madagascar (Menabe, SAVA, DIANA, Sofia, Melaky, and Boeny). The program was implemented by JSI Research & Training Institute, Inc. (JSI), with sub-recipients Transaid and The Manoff Group, and was carried out in close collaboration with the Ministry of Public Health, the Ministry of Water, Sanitation and Hygiene, and the Ministry of Youth and Sport. Over the course of the program, a total of 6,052 community health volunteers (CHVs) were trained, equipped, and supervised to provide basic health services in the areas of maternal, newborn, and child health; family planning and reproductive health, including sexually transmitted infections; water, sanitation, and hygiene; nutrition; and malaria treatment and prevention at the community level. The CHVs were selected by their own communities, supervised by heads of basic health centers, and provided services based on their scope of work as outlined in the National Community Health Policy. Their work and the work of other community actors involved with the MAHEFA program was entirely on a voluntary basis.

This brief is included in a series of fifteen MAHEFA technical briefs that share and highlight selected strategic approaches, innovations, results, and lessons learned from the program. Technical brief topics include *Behavior Change Empowerment, Community Radio Listening Groups, Community Score Card Approach, Chlorhexidine 7.1%/Misoprostol, Champion Communes Approach, Community Health Volunteer Mobility, Emergency Transport Systems, Malaria, Community Health Volunteer Motivation, Family Planning & Youth, WASH, eBox, Community Health Financing Scheme, Information Systems for Community Health and NGO Capacity Building.*

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