Creating a community-based program to transport high risk and severely ill patients to health facilities in Manhiça district, Mozambique

Authors: Saquina Cossa1, Maria Maixenchs1,2, Hèlio Timane1, Felismina Tamele1, Zubaida Manhenge1, Amílcar Magaço1, Inácio Mandomando1,2, Quique Bassat1,2,4,5,6, Khátia Munguambe1,7

1 Centro de Investigação em Saúde de Manhiça (CISM), Maputo, Mozambique
2 ISGlobal, Hospital Clinic-Universitat de Barcelona, Barcelona, Spain
3 Instituto Nacional de Saúde, Ministério de Saúde, Mozambique
4 Catalan Institution for Research and Advanced Studies (ICREA), Barcelona, Spain.
5 Pediatric Infectious Diseases Unit, Pediatrics Department, Hospital Sant Joan de Déu, University of Barcelona, Barcelona, Spain.
6 Consorcio de Investigación Biomédica en Red de Epidemiología y Salud Pública (CIBERESP), Madrid, Spain.
7 Faculty of Medicine, Universidade Eduardo Mondlane (UEM), Maputo, Mozambique

BACKGROUND

In low and middle-income countries (LMICs) like Mozambique, accessing health services can be very challenging for people living in rural areas. Common access issues include long travel distances to healthcare facilities, high transportation costs, lack of transportation options, perceived or real lack of health resources such as medications and supplies, and low personnel staffing in health facilities (1-7). In some of the countries across the CHAMPS network, participants at community engagement events often express concern about the lack of transportation options for severely ill people who require immediate health care but are unable to quickly reach health facilities. Data from 2015 estimates that 66.7% of the population of Mozambique are living more than 60 minutes away from a healthcare center, either by vehicle or on foot (8), and different communities in Manhiça District, Southern Mozambique, considered this issue a priority. The urgency placed on the need for better transportation was aligned with data from a previous study examining pre-eclampsia and mothers requiring emergency transportation to health facilities. This study, the Community Level Interventions for Pre-eclampsia (CLIP) Trial, conducted by Centro de Investigação em Saúde de Manhiça (CISM) in Maputo, Mozambique, provided an example of how to approach transportation issues as it incorporated maternal transport when necessary and community-based fundraising activities for transportation and treatment costs (4, 9, 10). Additionally, community members asked the important question of why CHAMPS had resources to transport bodies of children after death for research purposes but had not yet used those resources to provide transportation support for sick children.

With experience from the CLIP Trial and commitment from community members and CHAMPS, the idea was posed to implement a community-based fundraising program for transporting high-risk patients and severely ill people to health facilities. The local community and CHAMPS team worked together to design a transportation program for severely ill people that would be specific for each location and self-managed by the neighborhoods being served. Over time, the transportation program evolved to adapt to the needs of each community and incorporated other interventions such as transportation for women in labor, economic support for funeral costs, provision of food for caretakers during the time of hospitalization, and economic support for people living in extreme poverty.

The CHAMPS transportation program was launched in March 2019, building on and expanding the initial transport services offered as part of the CLIP Trial. Three hundred thirty-two (332) families joined at the time of the launch, but 109 additional
families joined by the following year to bring a total of 441 families by June 2021. By February 2023, a total of 739 families has joined and 69 services have been provided, namely transportation to the health facility, economic support for families to perform ceremonies and burials, and economic support for staying with the sick person in the hospital and buying medical treatment. Participants have reported being satisfied with the development and implementation of the program and they appreciate the flexibility of the program to adapt to their needs. This approach exemplifies the importance of engaging communities in designing and managing their own health-related programs as a crucial metric for success.

The transportation strategy was implemented at the CHAMPS catchment area in the Manhiça District. The Manhiça District (Figure 1) is a rural, resource-constrained setting, located in Southern Mozambique. The district has high rates of child mortality; 2015 estimates of infant and under-five mortality rates in Manhiça were 40.6 and 71 per 1000 live births, respectively (11). Mozambique remains in its early stages of the epidemiological transition, and most major causes of disease and death are infectious. In children, perinatal problems, pneumonia and malaria remain major contributors to premature mortality, whereas in adults, the HIV/tuberculosis epidemic and cardiovascular and other non-communicable diseases are most prevalent (12). These health conditions impacting morbidity and mortality are exacerbated by various social, economic, and cultural factors that impact residents’ access to health services. Since 1996, CISM has managed a Health Demographic Surveillance System (HDSS) that covers the entire district and includes a biannually-updated census of the population. The HDSS currently covers an area of 1880 km² with 201,845 inhabitants (11). The main sources of income for Manhiça District inhabitants are subsistence farming, industrial work (typically sugar manufacturing) and informal trading. The district has no formal transportation network and inhabitants in rural areas often reside many kilometers from a health facility.

![Figure 1: Manhiça District](Figure 1 from Sacoor C, Vitorino P, Nhacolo A et al. Child Health and Mortality Prevention Surveillance (CHAMPS): Manhiça site description, Mozambique. Gates Open Research 2023, 7:4https://doi.org/10.12688/gatesopenres.13931.1)

**RELEVANT PUBLIC HEALTH, SCIENTIFIC AND CLINICAL INFORMATION**

To construct the transportation program, 38 meetings with community members and five meetings with potential drivers were held in 19 locations across the CHAMPS Manhiça catchment area in October 2018 and April 2019 and conducted in the local language. In total, 1,413 people (517 men and 893 women) participated in community members’ meetings and 20 participated in “potential drivers” meetings. The aim of those meetings was to design a community-based transportation program that was feasible and responded to each community’s needs.

The first round of meetings with community members included discussions on:

i) Primary strategies and actions used by communities to access the healthcare system;

ii) Key barriers and facilitators to accessing health care;

iii) Ideas for a transportation plan that would overcome health care access barriers; and

iv) Identification of drivers from the communities who would be available to transport sick people to health facilities.
Then, in a second round of meetings, the CHAMPS Community Engagement team discussed a possible transportation program with community participants, inviting them to reflect on three specific issues and reply to the team if they were interested in the transportation program. The three issues included whether the communities, as a group, would be able to:

i) Identify people with cars (owners or drivers) who would commit to transporting seriously ill people;

ii) Determine the amount of money each family would have to contribute each month to compensate the drivers and to open a bank account for each location;

iii) Create a team of three people in each community that would be responsible for managing the community funds.

Of the 19 neighborhoods that held meetings, 5 decided to participate and move forward with implementing the transportation program. In these 5, a third round of meetings (one per neighborhood) were held to solicit feedback on the transportation program, share presentations from the three members responsible for managing funds (the transport commission), announce the identification of the potential drivers (the community provided a list), and discuss the amount of money that each family would contribute each month.

Five meetings were held with possible drivers from the neighborhoods that decided to participate in the program to determine their interest, how much they would charge, their commitment to providing transportation services, and if they would be able to wait for anyone who was not admitted at the health facility and needed a ride home. This additional input from potential drivers was essential to improving the transportation program.

Finally, the members of each transport commission met with the CHAMPS Community Liaison Officer (CLO) to open a bank account. CHAMPS contributed 3.000 Mt (45USD) per neighborhood and community with values from 20 Mt to 100 Mt per family per month. CHAMPS contributed 3.000 Mt (45USD) per neighborhood on a quarterly basis until October 2022. From then on, the community has been financing the transport program by itself, guaranteeing its sustainability.

Seven of the 19 neighborhoods decided not to participate and the remaining seven neighborhoods asked for more information, as there were disagreements among their community members about whether to participate. Seven meetings were held in those indecisive neighborhoods to provide further information and address concerns. After these meetings, none of these neighborhoods decided to participate to the transportation program, however. Reasons for non-participation were: more time needed to decide, insufficient funding, lack of consensus in the neighborhood regarding accepting the program, conviction that the government should provide transport for severely ill people, a hospital near the neighborhood will be built soon, and no reason given.

**PUBLIC HEALTH ACTIONS**

In March 2019, the transportation program was launched. The program initially included five neighborhoods, all from the Xinavane area: Buna, Kungufala, Mulombe, Ngwenyene, and Xitlavane. One additional Xinavane-area neighborhood, Pamene, joined in October 2019. The total area of transportation coverage encompassed 332 families.

Throughout 2022, efforts were made to add new neighborhoods, using the meetings structure previously reported. By February 2023, three new neighborhoods had joined the program (Mukhulo, Nwarigueremba and Eduardo Mondlane) and the total number of families covered increased to 739.

Traditional birth attendants (TBA) and community health workers (CHW) serving each neighborhood were responsible for evaluating the health situation and determining if the person requesting assistance would benefit from the transportation program before calling the drivers. A total of 21 drivers committed to transport severely ill people to the health facilities. One driver per neighborhood was always available. The drivers were not paid but a refund for fuel was provided.
FEEDBACK AND ADAPTING THE PROGRAM TO THE SPECIFIC NEEDS OF THE COMMUNITIES

After four months of implementation, feedback meetings and interviews with transportation system users and drivers started and have been taken place periodically in all locations. During these meetings, members of participating neighborhoods highlighted the importance of adding further interventions beyond transportation services for severely ill persons. The interventions mentioned included providing funeral expenses and the cost of a coffin if a death occurred in the neighborhood and providing economic support for food to those family members who remain with the sick person during hospital stays at Xinavane Rural Hospital, the Manhiça District Hospital or even in hospitals located in Maputo city. Those interventions were then added to the transportation program. In the Pamene, Buna, and Xitlavane neighborhoods, the community decided that pregnant women in labor were also a target for the transportation service, even if they were not “technically” sick. In Xitlavane, it was decided that funds would also be made available to people who had an accident and needed economic support until recovery. In Kungufala, it was decided that funds could also be used to support those living in extreme poverty. When interventions beyond transportation for sick people were supported by community members, it was agreed that the transport commission in each site should be responsible for deciding the appropriateness of each new intervention. No additional contributions were made for covering these new interventions, except in Pamene, where the community decided to increase from 20 Mt to 100 Mt the amount per family per month in May 2022.

During feedback meetings, participants from Kungufala and Xitlavane stated they were facing ethical issues when families that decided not to contribute to the community fund required help in an emergency situation. Those neighborhoods suggested that the CHAMPS team schedule a specific community meeting to explain the dynamics of the transportation program to avoid misunderstandings and tensions. Such a meeting was then held in each community by CHAMPS staff and tensions were solved.

During the feedback meetings held with drivers, all of them stated that it was difficult to calculate the cost per service and that they were previously providing transportation in case of emergency, without charging any money, as a rule of co-

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Figure 2: One of the cars used for the transportation system
existence and solidarity within their community. One of the drivers in Mulombe explained that the neighborhood calls his car “the ambulance,” as he uses it to transport sick people, to bring bodies to the hospital for preservation, and even to transport coffins to the cemetery as part of funeral and burial ceremonies. In Ngwenyene, transportation program cars have also been used for transferring bodies to the hospital and delivering coffins to the cemetery. In 2020, motorbikes and bicycles were approved to be used in case the roads were not passable by car or truck. The CHAMPS CE team and the members of the transport commissions also held periodical meetings to receive feedback on management of funds, bank account-related issues, and other administrative issues. Participants explained that they had not any difficulty managing funds and the state of accounts were clear.

In 2020, during the COVID-19 pandemic, in-person meetings were cancelled and replaced with phone calls with community leaders, religious leaders, TBAs, CHWs, and members of the transport commission. Those calls were extremely useful to better understand how communities were dealing with the pandemic and which factors were affecting the transportation program. In Buna, Mulombe, and Pamene, a decrease of contributions by families was reported due to the uncertainty resulting from COVID-19.

The total number of feedback meetings from launch until February 2023 included:

- Community at large: 129
- Drivers: 12
- TBA & CHW: 30
- Transportation commission: 32
- Telephone calls: 225

OUTCOMES

By February 2023, 69 families benefited from transportation services and all of them reported satisfaction with the system. Those interventions comprised:

- Thirty-seven (37) severely ill persons who were transported to a hospital, including seven (7) children. Of these, 20 were diagnosed with malaria, 1 with hypertension, 7 with pregnancy-related complications and the last 9 with respiratory diseases. Twenty-nine people were transported to the Xinavane Rural Hospital and 8 to Manhiça District Hospital. Nearly all (n=36) were discharged the same day; 1 person was transferred to Matola Provincial Hospital, located in Maputo Province. Twenty-eight beneficiaries recovered from the disease that required a visit to the hospital and 9 are still receiving medical care.

- Seven women in labor were transported to a health facility.

- Twenty-three bodies were transported to the health facility, for conservation while waiting the family to arrive from abroad for the ceremonies and the burial.
One economic support disbursement was provided for funeral expenses.

One economic support disbursement was given to a family member who stayed with a sick person at the hospital and bought medication.

Beneficiaries reported that the system was useful and functional due to the continuous availability of transport and drivers’ promptness.

When I got sick, my husband called one of the members of the transport commission, and suddenly we saw the car entering our compound to bring me to the Xinavane Rural Hospital. When I arrived, a nurse came and attended me immediately. He asked me how I was feeling. As I couldn’t explain, he examined me and did some tests. He prescribed me some drugs and recommended to go back home and to rest. The driver was waiting and brought me back home. I took the drugs and I recovered. I am very grateful; this program saved my life. (Woman, 48 years old, Kungufala Neighborhood)

When I was pregnant I got really sick, and since we are poor, even my husband couldn’t believe it when he saw the car coming. My family was very relieved to see the car taking me to the hospital and my neighbors saw the benefits of the transportation plan, as they did not expect the car to arrive to help me, at all. When I arrived at the hospital, I was attended to quickly. This program cannot stop, it must continue to help other people like me. I really thank the program. (Woman, 39 years old, Khungufala neighborhood)

Table 1: Use of the transportation program between March 2019 and February 2023, by participating community

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Families in the program</th>
<th>Drivers</th>
<th>Beneficiaries</th>
<th>Transport to the health facility</th>
<th>Transport of a body to the health facility</th>
<th>Labor</th>
<th>Funeral Costs</th>
<th>Economic Support</th>
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<tr>
<td>Buna</td>
<td>30</td>
<td>3</td>
<td>3</td>
<td>2</td>
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<td>0</td>
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<tr>
<td>Kungufala</td>
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<td>4</td>
<td>4</td>
<td>3</td>
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<td>1</td>
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<td>0</td>
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<tr>
<td>Mulombe</td>
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<td>4</td>
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<td>0</td>
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<tr>
<td>Ngwenyene</td>
<td>30</td>
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<td>4</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pamene</td>
<td>52</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>2</td>
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<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Xitlavane</td>
<td>253</td>
<td>2</td>
<td>42</td>
<td>16</td>
<td>19</td>
<td>6</td>
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<tr>
<td>Mukhulo</td>
<td>78</td>
<td>1</td>
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<td>3</td>
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<tr>
<td>Nwarigueremba</td>
<td>63</td>
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<td>2</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Eduardo Mondlane</td>
<td>127</td>
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<td>2</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Total</td>
<td>739</td>
<td>21</td>
<td>69</td>
<td>37</td>
<td>23</td>
<td>7</td>
<td>1</td>
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</tbody>
</table>
### Table 2: Beneficiaries by neighborhood, age group and outcome, March 2019-February 2023 (n=69)

<table>
<thead>
<tr>
<th>Beneficiaries*</th>
<th>Buna</th>
<th>Kungufala</th>
<th>Mulumbe</th>
<th>Ngwenyene</th>
<th>Pamene</th>
<th>Xitlavane</th>
<th>Mukhulilo</th>
<th>Nwarigueremba</th>
<th>Eduardo Mondlane</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>By age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children 0-5 years old</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Children 6-18 years old</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Adults &amp; Elders</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>32</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>57</td>
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<tr>
<td>Total number of beneficiaries: 69</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>By outcome</td>
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<tr>
<td>Recovery</td>
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<td>4</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>22</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>43</td>
</tr>
<tr>
<td>Transfer to an another health facility</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Death</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Transfer of a body</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>NA 1</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

*Groups are independent and therefore not cumulative.

1 The intervention did not imply any transport (Funeral expenses and economic support)

### LESSONS LEARNED, RECOMMENDATIONS AND NEXT STEPS

The main lessons learned and recommendations include:

- Alignment of health programs’ objectives and the objectives of the community is essential for mutual collaboration.
- Engaging communities in designing their own health-related strategies according to their local needs and having the community manage their own initiatives is crucial for successful implementation of the program.
- Strategies like this one should be considered as long-term initiatives where trust and transparency are key elements.
- Solutions and strategies must come from the communities in order to be specific, tailored, accepted, respectful and adequate.
- Feedback and support should be constant, and concerns expressed during feedback meetings and gatherings have to be addressed.
- Interventions have to be sustainable. The transport program implies a cost for the families, but this cost guarantees that transportation and other interventions can be maintained if the CHAMPS Program can no longer provide support. CHAMPS finished contributing in October, 2022 and all of the neighborhoods involved have continued the program.
- Flexibility to adapt the program according to community needs over time is essential. For example, transportation for deaths and covering funeral expenses were ultimately included in the program because they were necessary services for the communities.
- The commitment of the community is essential and provides a sense of unity.
Next Steps

- Consistent feedback should continue to be solicited
- The program should continue to evolve and adapt to any emerging needs from participating communities.

Acknowledgements

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For More Information

www.champshealth.org
www.en.cismmanhica.org
REFERENCES


