

# Maternal and Child Health Implementation Research in Mozambique: Effective Community Interventions to Promote Sexual and Reproductive Health

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## Research

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# Abstract

**Background:** High maternal and neonatal mortality rates in Mozambique, are due to adolescent pregnancies, difficulties in accessing health services, traditional constraints, and gender inequalities. An implementation research project, Alert Community to Prepared Hospital in Naticiri, Nampula, Mozambique was developed to reduce maternal and new-born mortality. From 2016 to 2020, it implemented activities to improve population knowledge and function in sexual and reproductive health, and to enable community participation in maternal health services. In this paper we will assess and discuss the impact of community participation on improving sexual and reproductive health.

**Methods:** Implementation research with community intervention and programmed mid-term evaluations, using mixed methods research, with descriptive quantitative surveys and qualitative focus groups discussions and interviews, applied from 2017 to 2020. Local health committees, traditional birth attendants, traditional healers and local leadership all participated: trained in sexual and reproductive health and participated in radio discussion groups; community and hospital members of the co-management committee enabled local programming. Maternal and child health indicators were evaluated with health unit's operational data. Quantitative data were captured in Microsoft Office Excel, analysed with SPSS21 to find frequency, percentage, mean and standard deviation; qualitative data registered in Word was analysed with NVIVO. This research received bioethical approvals from both the Mozambique and Canadian universities and followed Helsinki Declaration recommendations.

**Results:** Comparing changes from 2016 to 2019, the number of health committees operating in Naticiri rose from 7 to 20. Each committee integrated four Family Health Champions, who attained 24738 residents with health education interventions on reproductive health. A theatre group developed dramas about the same key messages, presented in communities. Population access to contraceptives was facilitated, from 42% to 91% in women and from 65% to 90% in men. At Marrere Health Centre, women with four ante-natal visits rose by 185%, and children less than one year of age' visits 89%; at Marrere General Hospital deliveries rose 60%.

**Conclusion:** Community participation, at all levels of maternal and child health service care continuum, from community to hospital, enhanced with complementary interventions well contextualised, is effective in improving adolescent and adult sexual and reproductive health.

## Trial registration

This study was not registered in any data base.

## Plain English Summary

Alert Community to a Prepared Hospital implementation research project was carried out in Naticiri, Nampula, Mozambique, from 2016 to 2020, aiming to reduce maternal and neonatal mortality rates, a public health problem in this country. It deployed activities to improve population knowledge and function

in sexual and reproductive health and enable community participation in maternal health services: trainings, radio discussion groups, drama.

Using mixed methods research to evaluate results with local health committees, traditional birth attendants, traditional healers, and local leadership we compared maternal and child health indicators evolution at health units.

Comparing changes from 2016 to 2019, the number of local health committees rose, attaining 24738 residents with health education interventions, population access to contraceptives was facilitated, from 42% to 91% in women and from 65% to 90% in men, women with four ante-natal visits rose by 185%, children less than one year of age' visits 89% and maternity 60%.

Community participation at maternal and child health service care demonstrated to be effective in improving adolescent and adult sexual and reproductive health.

## Introduction

Mozambique has high maternal mortality rates (452/100000 live births, 2017) and child mortality (67.3/1000 live births),<sup>1</sup> due to a variety of factors including adolescent pregnancies, a high fertility rate, low family planning (FP) practice, insufficient numbers of qualified health professionals (HP), lack of medical equipment and materials, a poor referral system, difficulties in accessing health services (transportation, long waiting times, and illicit charges at the pharmacy to get drugs, in the emergency room to get faster attendance, and in maternity to get delivery support), traditional religious constraints and societally embedded gender inequalities.<sup>2,3</sup>

A participatory implementation research project,<sup>4</sup> Alert Community to Prepared Hospital care continuum (ACPH), in Naticiri, Nampula, Mozambique, was developed to reduce maternal and new-born mortality, and was subsequently implemented, funded by the International Development Research Centre (IDRC in Ottawa with support from the Canadian Institutes of Health Research and Global Affairs Canada). It took place from 2016 to 2020, including research teams from Lúrio University (UniLúrio, in Nampula) and the University of Saskatchewan (in Saskatoon, Canada).

A base line study was conducted in 2016, with a large community consultation, including Local Health Committees (LHCs) and other community-based organization members, traditional birth attendants (TBAs), traditional healers and local leadership, with a simple question: "why are pregnant women and new-borns dying in your community?".<sup>5</sup> Some of the most common answers were complaints about HPs misbehaviour, including illicit charges. The complaint process was unusable at the hospital: community members informed that complaints did not have any impact, and never led to any changes in service delivery. LHCs in Naticiri were mostly inactive, and the hospital co-management committee (CMC) only met occasionally with few participants.

Strategies were designed to improve population empowerment in sexual and reproductive health (SRH), and enhance access and enable community participation in maternal and child health (MCH) services, an efficient proven strategy,<sup>6</sup> at Marrere Health Centre (MHC) and Marrere General Hospital (MGH), the health units (HUs) serving the Natikiri population (over 56000).

We based all our objectives on Ministry of Health (MISAU) defined strategies, programs, and tools, and worked in close partnership with the community. MISAU targets illicit charges (“petty” / administrative, bribery, favouritism),<sup>7</sup> and the issue of difficult access to health care in three ways:

- Development of LHCs, to inform, educate and discuss with community members, regarding health issues.
- Development of health centres and hospitals CMCs, gathering HPs and members of LHCs to discuss, inform and cooperate on questions of facility management and provision of health care services.
- Development of the HUs challenges survey tool,<sup>8</sup> which uses a community and hospital-based report, and meetings to monitor and evaluate hospital function and user satisfaction.

MISAU has designed an effective community participation program, widely known to help increase the quality of public health services,<sup>9</sup> but this strategy is rarely applied in the field.

To proceed with interventions, we established several partnerships: with MISAU, Nampula Provincial Health Directorate, Nampula City Health Directorate; and several non-governmental organizations, working on health issues in the area.

In this paper we will assess and discuss the impact of our community participation interventions and alliances, on improving SRH, FP and child health in rural northern Mozambique.

## Materials And Methods

The aim of this study was to evaluate the impact of community MCH empowerment, to better access and quality of MCH care services in Nampula, Mozambique.

## Design

This is an implementation research with community interventions and programmed mid-term evaluations, using mixed methods research to collect data, with quantitative documental review and descriptive cross-sectional surveys, and qualitative focus groups discussions and interviews, applied from 2017 to 2020 in Natikiri.

## Interventions

To achieve behaviour changes, between 2017 and 2019, we applied a mass media campaign,<sup>10</sup> and several trainings on SRH, FP, child health, nutrition, community service, were organised and held in the

local language (Emakhuwa), with all community groups, as recommended in other studies,<sup>11</sup> together with interventions at HUs (HPs trainings, ante-natal visits and maternity equipment and consumables provision), and monitored by pre and post intervention surveys, focus group discussions and documentary data collection.

We revived and trained other LHCs that have been inactive for several years, promoting their participation in MGH CMC meetings. Each LHC selected and incorporated “family health champions” to visit families with key health education messages, a recognised tool to better mother’s health.<sup>12</sup>

A theatre group was formed and created four original short dramas about the same key messages, and subsequently presented them twice monthly in different communities.

Radio discussion groups debated newly developed and diffused SRH weekly broadcasts on radio stations, using the local language, an efficient strategy applied in other countries in Africa.<sup>13</sup>

TBAs, after training, mentored and followed pregnant women through to maternity delivery and new-born visits.

A newly developed local transport system was implemented to take women (and other emergencies) to the maternity at MGH. Six motorcycle ambulances were specifically designed and manufactured, and then were deployed and placed in geographically strategic communities LHCs, covering a total of 18 Naticiri communities. Drivers were licenced and trained in basic first aid and public service, and community-based keepers were selected and trained.

The members of MGH CMC took a leading interest, meeting every two months to review complaints, enabling all aspects of local programming, and voluntarily participating in information and education programs. We facilitated MGH as the first hospital in Mozambique to systematically use the HUs Challenges Survey tool, by the CMC in regular meetings, monitoring health services evolution and communities’ opinions.

This was part of creating a ‘prepared hospital’ but more so, various specific interventions were directed to the hospital, including construction of a new surgical suite for caesarean sections, other equipment including two ultrasound machines and other supplies, and much provider training through workshops which were all evaluated.

## **Data collection**

The surveys were carried out on a regular basis, in the catchment area of MGH and MHC (both adjacent to UniLúrio), by UniLúrio Faculty of Health Sciences (FHS)’ students duly trained, to identify, assess and track changes in relevant community knowledge, attitudes and behaviours about SRH, FP and child health.

Periodic focus group discussions with each major stakeholder group, were conducted to explore intervention barriers and successes.

Monthly traditional birth attendant reports and motorcycle ambulances activities were tallied and assessed.

Furthermore, to assess the acceptability, appropriateness, and feasibility of the implementation strategies, we carried out in-depth telephone interviews with community members, including adolescent and adult men and women.

Data from MGH and MHC statistics departments was collected periodically.

## **Data analysis**

Quantitative data were captured in Microsoft Office Excel and analysed with SPSS21, using frequency, percentage, mean, standard deviation.

MCH indicators were evaluated along with hospital and health centre operational data as was implementation of the project's key messages.

Qualitative data were recorded and transcribed, before being analysed with NVIVO software using a content analysis approach.

## **Bioethics**

Before implementation, this research received bioethical approvals from both Mozambique and Canadian universities. All participants signed or recorded and informed consent term. The study followed Helsinki Declaration (2013) recommendations.

## **Results**

Much data was collected and assessed comparing changes from 2016 to 2019.

The number of LHCs actively operating in Natikiri rose from 6 to 20, to cover 95% of communities and target population; and LHCs members rose from 70 to 337, with health information and education activities reaching more than 10000 persons per year. Each LHC selected and integrated four Family Health Champions (both genders, two adolescents and two adults), and managed to attain 3008 health education interventions with 24738 residents, sharing and discussing SRH key messages in the local language.

The theatre group presented the dramas about the same key messages twice monthly in different communities (public audience estimated at 1600 in 2018 and 1200 in 2019).

Population knowledge scores on family planning (what is it, how to do it and where to get contraceptives) rose from 64–83% in men and 86% in women; access to contraceptives was facilitated, from 42–91% in

women and from 65–90% in men.<sup>14</sup> In 2019, asked if they wanted to use family planning, 70% of respondents answered positively but only 47% of adults and 18% of adolescents stated they use family planning.

Among the communities the number of trained TBAs rose from 16 to 89, and they assisted 915 pregnant women in 2018 and 2004 in 2019. The number of pregnant women referred to the hospital for delivery rose from 59 (2016) to 708 (2019), and the number of pregnant women with obstetric risk signs being assisted rose from 0 (2016) to 108 (2019).

The motorcycle-ambulance transportation system implemented in six LHCs, and supported in part by newly formed local saving groups, carried 156 (2018) and 122 (2019) women to deliver at MGH maternity, where a significant investment from the project helped improve delivery facilities and personnel.

At MHC, the number of women with a first ante-natal consultation rose 27% (from 1882 in 2016 to 2393 in 2019); women with four ante-natal visits rose 185% (from 405 to 1155); and children less than one year of age visits rose 89% (from 1132 to 2139). At MGH maternity deliveries rose 60% (from 1243 to 1991) during the same period.

The MGH-CMC met 13 times over two years (2018–2019), gathering 68 different LHCs members (TBAs, traditional and religious leaders), and 39 HPs (including the management team, MGH board, statisticians, doctors, and nurses), changing the previous limited representation from the communities, occasional meetings and low impact on MGH and MHC services delivery. Subsequently, this increased volunteer participation in patient orientation, care and cleaning activities (community volunteers were scheduled weekly to be at the hospital to support, inform, and educate users), it reduced the practice of charging illicit fees (and when they did happen, the complaints got to MGH management board and were quickly solved), and helped resolve dysfunctional human resource situations. This all resulted in better service delivery. The CMC also successfully raised further external funds and started construction on a “Mothers waiting house”, outside the MGH, to promote and facilitate deliveries at the maternity.

The interviews revealed that the community believed the project’ strategies to be acceptable, appropriate, and feasible. The main themes that emerged from the qualitative analyses included the perceived beneficial nature of the interventions, and their ability to improve knowledge and attitudes about SRH. When asked about the viability of this project, one of our respondents said:

*“It is viable, yes, we cannot stop! We have to continue giving lectures in the communities.”* (Traditional Leader, male, 46 years).

## Discussion

Community participation through empowerment,<sup>15</sup> is known to be essential to better health services, but requires material and other inputs.<sup>16,17</sup> When approached by trusted partners, communities are eager to

decrease maternal and child morbidity and mortality. They volunteer to cooperate, and their leaders are willing to receive health training and are ready to participate in health education in their communities.<sup>18</sup> The communities were incredibly happy with the local theatre and radio programs.

LHCs are strong preventive medicine and screening agents, able to participate in HUs and services management, and community education.

The CMC intervention had a low cost (over two years we estimated \$900 USD), but was effective at improving health services and decreasing illicit charges, with leadership and monitoring support.

The project's volunteer family health champions, TBAs training programs, community theatre dramas, radio programs and engagement with adolescent initiation rite leaders, increased the local population's knowledge about SRH and rights, leading to more positive attitudes towards FP and hospital deliveries. These achievements have been demonstrated in other low and middle-income countries.<sup>19,20,21</sup>

FP practice remains lower than possible and desirable due to economic constraints, religious and supply barriers.

TBAs became readily engaged as maternal health promoters and were recognised to be excellent referrers and protectors of mothers and babies, as seen in other studies.<sup>22</sup> They were also found to be appropriate and accepted companions during the hospital deliveries (which was another interesting innovation); similar to evidence presented from other studies in Africa.<sup>23</sup>

The transportation system facilitated many transfers though remained under used, due to technical difficulties (legal, mechanical and communication), and in need of management improvements. Subsequently, during the last year of the research, external funding was procured to enable a social enterprise (Project Frango) to be initiated to assist the sustainability of this transport system.

Facing a financial and human resource crisis common in the public sector, health service performance, nonetheless, improved, sustaining an acceptable quality, and acquiring additional human and material resources. The local population recognised the good performance of MGH and MHC.

The overall emerging increased inclusivity, empowered community leaders and TBAs, to share their SRH and FP knowledge with their communities and improved their attitudes and practices.

Implementation participatory research method, has shown a positive effect to empower population, in terms of health knowledge, attitude and participation<sup>24</sup> in health services management.

## Conclusions

This study shows that community empowerment and participation, at all levels of MCH service care continuum, from community to hospital, enhanced with complementary interventions well contextualised,

are acceptable, feasible and effective in improving adolescent and adult SRH, in reducing maternal and new-born morbidity and making significant community contributions.

To reduce maternal and child morbidity and mortality in Mozambique, we need to focus more investment on health information and education, by supporting trusted local partners, to help with the development and maintenance of LHCs, using the local language. These community partners can map, identify, and develop LHCs to strengthen implementation of national policies and strategies, to improve MCH and the quality of delivery services. It is necessary to create, monitor, and support CMCs in all health centres and hospitals, using the HUs Challenges Survey Tool, to improve the complaints process, reduce illicit charges and improve the overall patient and provider experience.

## **Abbreviations**

ACPH – Alert Community for a Prepared Hospital care continuum.

CMC – Co-management committee.

FHS – Faculty of Health Sciences.

FP – Family planning.

HP – Health professional.

HU – Health unit.

IDRC – International Development Research Centre.

LHC – Local health committee.

MCH – Maternal and child health.

MGH – Marrere general hospital.

MHC – Marrere Health centre.

MISAU – Mozambican Ministry of Health.

SRH – Sexual and reproductive health.

TBA – Traditional birth attendant.

UniLúrio – Lúrio University.

## **Declarations**

## **Ethics approval and consent to participate**

This research was allowed by the Faculty of Health Sciences of Lúrio University, Nampula Provincial Health Directorate, and approved by Lúrio University Bioethics Health Committee (02/CBISUL/16), and the University of Saskatchewan Bioethics Committee (15-112).

We followed all Helsinki Declaration (2013) recommendations, all participants were volunteers, anonymity guaranteed, free to desist if uncomfortable without any negative condition, signing or recording an informed declaration consent term. This research had no risk or remuneration to participants. They agreed to give their time and opinion on this topic to benefit the population, contribute to improve public health policy interventions and implementation research, and empower inhabitants with SRH knowledge.

The study did not involve the use of animals.

## **Consent for publication**

This manuscript does not contain data from any individual person. Not applicable.

The authors declare they have reviewed this manuscript and agree to submit it to BioMed Central Reproductive Health Journal. The Faculty of Health Sciences at Lúrio University has authorised this publication.

## **Availability of data and materials**

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

## **Competing interests**

The authors declare they have no competing interests with study design or final report, no financial or personal relationships with other people or organizations that could inappropriately influence this research.

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## Authors contributions

PP: Study protocol conception and design, data analysis and interpretation, article draft, final approval of the version to be published.

MM: Study protocol design, data treatment, analysis and interpretation, final approval of the version to be published.

DZ: Study protocol conception and design, data interpretation, article draft, final approval of the version to be published.

JM: Study protocol design, data interpretation, final approval of the version to be published.

AA: Study protocol design, data collection and interpretation, final approval of the version to be published.

CM: Study protocol design, data collection and interpretation, final approval of the version to be published.

RS: Study protocol conception and design, data interpretation, article draft, final approval of the version to be published.

CB: Study protocol conception and design, data interpretation, final approval of the version to be published.

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