

# An Analysis of the Quality of Maternity Services in Nampula, Mozambique.

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## Research

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# Abstract

## Background

Maternity service quality is essential to reduce maternal and new-born morbidity and mortality (extremely high in Africa, including Mozambique). In Mozambique, maternal mortality rate is 451.6 maternal deaths per 100000 live births (2017). The reasons for this are complex, but one important factor to reduce this burden is ensuring the quality of maternity services, with the availability of efficient care, to improve institutional deliveries. To contribute to reduce maternal and new-born mortality rates in Natikiri, Nampula, the Lúrio University and the University of Saskatchewan, carried out an implementation research, including training activities for health professionals in maternal and child health care. We planned a mid-project evaluation, to assess the impact of the trainings, on the quality of services at Marrere Hospital Maternity.

## Methods

Quantitative pre-post study, applying two cross-sectional surveys about maternity service quality, one of the surveys being conducted after five health professionals' trainings and the other after six more trainings. The two surveys included samples of post-partum women in the maternity, calculated with a 10% margin error and 90% confidence interval for the first survey, and with a 7% margin error and 95% confidence interval for the second. The surveys were entered into *REDCap* and analysed to assess frequency, percentage, mean and standard deviation. This research was approved by the Institutional Committees of Bioethics at Lúrio University and at the University of Saskatchewan.

## Results

116 post-partum women were surveyed at the maternity, assessing standards of patient centred care during delivery labour. Most areas showed no improvement. Some positive improvements were: delivering women were given the option to have a person of their choice to accompany them during labour (75%), notably a traditional birth attendant (34%), and they had continuous support from an health professional (68%). But many shortcomings persisted in areas of privacy (33%), and confidentiality (57%).

## Conclusion

The quality of patient centred care at Marrere General Hospital Maternity, did not improve with health professionals training. Decreasing the large turnover rate, and reviewing health professionals learning styles, promoting continuous professional capacity building, would be the next steps to improve quality of patient centred care.

## Trial registration

This study was not registered in any data base.

## Plain English Summary

Maternity service quality is essential to reduce maternal and new-born morbidity and mortality rates, extremely high in Mozambique. To reduce these public health problems in Naticiri, Nampula, the Lúrio University and the University of Saskatchewan, carried out an implementation research, including training activities for health professionals in maternal and child health care. We planned a mid-project evaluation, to assess the impact of the trainings, on the quality of services at Marrere Hospital Maternity.

Quantitative pre-post study, applying two cross-sectional surveys about maternity service quality, one of the surveys being conducted after five health professionals' trainings and the other after six more trainings. The two surveys included samples of post-partum women in the maternity. This research was approved by the Bioethics Committees at Lúrio University and at the University of Saskatchewan.

We assessed 116 post-partum women about standards of patient centred care during delivery labour. Most areas showed no improvement. Some positive improvements were: delivering women were given the option to have a person of their choice to accompany them during labour (75%), notably a traditional birth attendant (34%), and they had continuous support from an health professional (68%).

The quality of patient centred care at Marrere Hospital Maternity, did not improve with health professionals training. Decreasing the large turnover rate, and reviewing health professionals learning styles, promoting continuous professional capacity building, would be the next steps to improve quality of patient centred care.

## Background

Maternal and child mortality have their highest incidence around delivery time. Access to and quality of maternal and child health (MCH) services, are essential to achieve sustainable development goals number 3 and 5,<sup>1</sup> especially in developing countries; those include reducing rates of morbidity and mortality in these groups, which in Mozambique are among the highest in Africa and the world. To reduce maternal and perinatal mortality associated with birth, labour management all over the world has been evolving and there has been a shift to facility-based childbirth.<sup>2</sup> The World Health Organisation (WHO), produced in 2018 specific recommendations for intrapartum care for a positive childbirth experience, to approach those issues.<sup>3</sup>

In Mozambique, though the maternal and child mortality rates have been decreasing in the last two decades,<sup>4</sup> nevertheless, they are still high (451.6 maternal deaths per 100000 live births, 67.3 deaths of children less than one year of age per 1000 live births, 2017).<sup>5</sup> Among the main causes are the lack of qualified health professionals (HPs), equipment and supplies, poor quality of care, deficient referral system, long distances and lack of transport to access the health unit (HU), poor communication between HPs and the community, and gender issues. These barriers to MCH, are common to low-and-middle income countries,<sup>6</sup> mainly in sub-Saharan Africa.<sup>7</sup>

Although the national Ministry of Health (MISAU) defined policies to guarantee sexual and reproductive health (SRH) and rights in 2011,<sup>8</sup> in the last decade, the low quality of MCH services in Mozambique, has hardly improved.<sup>9</sup> An assessment of quality and access to health care, in 195 countries in 2016, placed Mozambique in position 179 (the 6th worst).<sup>10</sup>

These facts led the Faculty of Health Sciences (FHS) of the Lúrio University (UniLúrio) and the University of Saskatchewan in Canada to develop an implementation research on MCH, in the Natikiri district, in Nampula province, Mozambique, called Alert Community to a Prepared Hospital care continuum (ACPH). A baseline study showed a low level of knowledge about SRH and rights in the Natikiri population and poor family planning (FP) practice.<sup>11</sup> Project activities stimulated community participation and SRH and FP education, and also provided trainings for HPs in obstetric emergencies, new born resuscitation, SRH rights, ante-natal consultation and humanization of care in Marrere General Hospital (MGH). One echograph and some other equipment and consumables were also provided to the maternity.

This paper pertains to the results of a planned mid-project evaluation, intended to estimate the impact of HPs training in MCH, demonstrated to have a positive impact in the quality of maternity services.<sup>12</sup> Given the importance of feedback from users to evaluate health services, with regards to the quality of care issues, communication, information, and advice, we surveyed user groups at the maternity.

This implementation research targeted participants citizenship and health empowerment, informing and educating population and HPs.

## Methods

### Design

This was a quantitative pre-post study, applying two cross-sectional surveys on user's opinion about maternity services quality.

### Activities

The first survey was done during the 3rd semester of the project (2018), after five training sessions (two on obstetric emergencies, two on new-born resuscitation, one on ante-natal consultation); the second survey was done on the 6<sup>th</sup> semester (2019), after eleven training sessions (one in ante-natal consultation, two more on new-born resuscitation, two on family-friendly consultation and humanized care, and one in SRH); five days each, 20 hours in total), given to 60 HPs over the eleven modules.

Sample: To calculate representative samples of post-partum women at MGH maternity, Natikiri district, Nampula, we considered the monthly average number of deliveries, 142 in 2018, with a margin of error of 10% and a confidence interval of 90 %, attaining 47 women, and 166 in 2019, with a 95% confidence interval, and a margin of error of 7%, attaining 91 women.

The two groups are made up of different subjects.

Data collection: these groups were submitted to a closed ended survey, previously tested, in Portuguese or Emakhuwa (local language) according to the participant's preference, administered by UniLúrio FHS' students, after being adequately trained and signing ethical and scientific commitment forms. Post-partum women were questioned in private at the MGH maternity, from 24 to 31 July 2018 and from 28 November to 6 December 2019. All women were informed they were free to participate voluntarily, or abandon the survey if they wanted, without any consequences in access or quality of care, and signed an informed consent form, including an informed assent term for adolescents under 18 years of age.

The surveys were answered using a 5-point Likert scale (i.e., totally agree, agree, indifferent, disagree, strongly disagree), were evaluated on the quality of completion by the principal investigator and introduced into *REDCap* (Research Electronic Data Capture) at <https://rev.unilurio.ac.mz/umestumafam/redcap>, by the same students, accompanied by a FHS lecturer to consult as needed. The data were then analysed by a statistics professor to assess frequency, percentage, mean and standard deviation.

This study was approved by the Institutional Committee on Bioethics for Health at UniLúrio and the Bioethics Committee at the University of Saskatchewan and followed all Helsinki Declaration (2013) guidelines.

## Results

We surveyed 116 post-partum women at the MGH Maternity (24 after five HPs trainings, 92 after a total of 11 training sessions), with a mean age of 23.6 years (standard deviation 5.7), minimum 14 and maximum 40 years (5.4% with less than 18 and 5.5% withy more than 34). Concerning school level, 42.4% are illiterate, 44.6% completed primary school and 12% secondary level, with one with higher education. The participants' characteristics are detailed in Table 1.

Comparing 2018 with 2019, the proportions of residence locations changed, with an increase in Natikiri; there was a slight increase in previous pregnancies number and in maternity deliveries and the percentage of home deliveries increased two fold; there was no significant change in the percentage of women referring miscarriage.

### **Table 1: Participant characteristics.**

No.	Question	Answer	2018 (n=24)	2019 (n=92)	Progress (%)
			Post 5 trainings	Post 11 trainings	
1	Residence (%)	Natikiri	83	97.8	18
		Other	17	2.2	-87
2	Number of previous pregnancies	Average (n)	2.6	3.1	19
		<= 3 (%)	71	68.5	-4
3	Number of hospital deliveries	Average (n)	2.4	2.45	18
4	Home births	(%)	12.5	24.2	94
5	Miscarriages	No (%)	83	82.4	-1
		Yes (%)	17	17.6	4

Legend: N – number of participants; % - percentage.

The assessment of principles of good care show a negative evolution in all areas, including communication with patients, privacy and confidentiality, care during labour and childcare: the patients felt less welcome at the maternity, HPs did not introduced themselves or asked if they had any doubts, HPs did not ask their name, did not encouraged them to raise questions and state their expectations at the beginning of the consultation and did not explain what they would do, before performing physical examination or other interventions, did not encourage the husband participation caring for the new-born.

Some positive points were identified about care during labour: delivering women were given the option to have a person of their choice to accompany them during labour (75%), notably a traditional birth attendant (34%) , they had continuous support from an health professional (68%), and were able to deliver in a position of their choice (34%). Annex 1 presents detailed answers.

The last question summarizes the findings of participants perception, asking the women how they evaluate their overall experience at the maternity. Most women globally rated their experience in maternity delivery as excellent (33%) and good (52%), but the evolution of this service, however, was unfavourable (see Table 2).

**Table 2: Users' opinions about maternity service quality**

Question	Response (%)	2018 (n = 24)		2019 (n = 92)	
		Post 5 trainings	Post 11 trainings	Post 5 trainings	Post 11 trainings
How do you evaluate your experience delivering at Marrere General Hospital Maternity?	Great	25	33		
	Good	70.8	51.6		
	Not very satisfied	4.2	12.1		267
	Not satisfied	0	3.3		

Legend: N – number of participants; % - percentage.

In answers to open questions, in 2019 survey, about what they liked in the maternity, 52 women (56.5%) liked reception, but 15 (16.3%) did not like anything. About what they did not like about the service, 12 women (13.6%) refer to HPs delay and 8 (9.1%) point a bad reception and treatment; about what they would change to make the service better, 56 (63,6%) would do nothing, 15 women (17.0%) reported improving the reception of patients by HP and 8 (9.1%) improving HPs punctuality.

## Discussion

Most of the study group lives in the three communal units of Naticiri neighbourhoods, with an increasing trend over time, and have a low school level.

Mean number of pregnancies per women remains under the national average (5.2), with more than half having three or less pregnancies per women, probably due to the low group' mean age. Home births increased, or women felt more at ease to reveal it.

Miscarriages (spontaneous and provoked) show no change; this topic is culturally sensitive, and we assume that the reality goes beyond the cases mentioned.

HPs informed delivering women that they had the option to have a person of their choice to accompany them during labour, and this is a low-cost and effective intervention to improve the quality of maternity care.<sup>13</sup>

In 2019, most post-partum women in MGH maternity is satisfied with the service, probably due to their low education level; but HPs do not generally proceed according to the rules of good care and the MISAU MCH protocol; they have deficiencies in patients' reception, information, and communication, and in matters of confidentiality. In another study in Tanzania, mothers also reported mistreatment, failure to meet professional standards of care, poor rapport between women and providers.<sup>14</sup>

HPs respectful and appropriate attitudes towards mothers are essential to ensure the quality of child-birth experience,<sup>15</sup> but systematic reviews on maternity services quality, all over the world, have also shown a

widespread occurrence of different forms of mistreatment of women during delivery, impacting negatively on both clinical and psychological outcomes, and also poor staff knowledge and skills.<sup>16</sup> Our evaluation reveals no significant impact of HPs trainings on maternity attendance quality. This finding might be related to the high turnover of MGH professionals, by a mandated reduction of MCH HPs causing an overload of work to those remaining, and associated with a decrease in economic resources, in parallel with low salaries and extra-hours missing payments. On top of this, we verified 3 of the 11 modules were not evaluated; in the 8 evaluated, we had 22% participants missing in the post-test and mean evaluation of progress was weak (17%).

**Table 3: Evolution of maternity deliveries at Marrere General Hospital**

Indicator	Service	2016	2017	2018	2019	Progress (%) 2016 - 2019
Number of Deliveries	Maternity	1243	1803	1709	1991	60

(Data collected from Marrere General Hospital yearly activity reports)

Subsequent recommendations for MGH maternity professionals, were directly transmitted verbally in follow-up meetings, and written down and delivered to MGH Director and all HPs.

We recommend a national birth attendants training campaign, continuous,<sup>17</sup> and regular, about skills to deal with complications (breech birth, malpresentation, multiple pregnancy, and shoulder dystocia),<sup>18</sup> about values, transforming attitudes, and interpersonal communication.<sup>19</sup> This must be combined with a significative improvement on maternity HPs working conditions.

Study limitations: as study limitations we point out the location of interviews in MGH Maternity, that might have influenced some answers. Another issue is the application of the Likert scale to a population with perceived difficulty in abstract conceptualization, in which the terms totally and partially, or always and most times may have been not well understood. Another limiting factor in comparing the two studies is the use of a 90% confidence interval and 10% margin of error in the first sample, different from the second (95% and 7% respectively), so as the inferior number of subjects in the first survey (24 of calculated 47) due to the low number of deliveries in the data collecting period.

## Conclusion

Health systems are faced today with new (antimicrobial resistance, climate emergency, Covid-19 pandemic) and old (in Africa, traditional healers' preponderance, drugs interactions with medical plants) challenges, and will be forced to develop new intervention methods.

MCH HPs are subjected to a heavy workload, specially at the maternity, and they do not usually practice according to protocol, having several shortcomings in patient's reception, information, and communication.

Although most post-partum women were satisfied with the care provided, and the maternity statistical indicators show improvement in the number of deliveries, we know maternal and child mortality incidence are the highest around delivery period.

The Mozambican health system continually faces challenges, looking for new tools for action. Continuous HPs training and better working conditions are keys to achieve behaviour change and better maternity services quality. These interventions depend on MISAU innovative and investment to:

1. Ensure the number required and continuity of MCH HPs at HUs.
2. Better HPs working conditions.
3. Provide the necessary consumables for properly functioning services, including medicines, gloves, masks, and health information and education materials.
4. Promote recurrent trainings of MCH HPs, reinforcement and updating, in obstetric care, new-born care, humanized consultation, and patient centred and family friendly services.

## Abbreviations

ACPH – Alert Community for a Prepared Hospital care continuum

FHS - Faculty of Health Sciences

FP - Family planning

HP - Health professional

HU – Health unit

MCH – Maternal and child health

MGH - Marrere General Hospital

MISAU - Ministry of Health of the Republic of Mozambique

SRH - Sexual and reproductive health

UniLúrio - Lúrio University

WHO – World Health Organization

## Declarations

### Ethics approval and consent to participate

This research was allowed by the FHS of UniLúrio, Nampula Provincial Health Directorate, and approved by Lúrio University Bioethics for 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 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 contribute to improve public health policy interventions 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 FHS at UniLúrio 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.

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

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## Supplementary Files

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