

Title: Inequitable access to antenatal services in rural primary health care facilities in northern Mozambique. Findings from a community and health facility assessment in Cabo Delgado Province.

**Piera Fogliati- Médicos com Africa – CUAMM; Cabo Delgado*

Leonardo Pedro Monforte - Médicos com Africa – CUAMM; Cabo Delgado

Mussa Manuel Aly- Núcleo de Investigação Operativa de Pemba; Cabo Delgado

**corresponding author: p.fogliati@cuamm.org*

Introduction

Each year malaria is responsible for 217 026 stillbirths, 100 000 infant deaths due to low birthweight in sub-Saharan Africa and for 10 000 maternal deaths globally [1, 2]. To reduce the burden of malaria in pregnancy, in addition to effective illness case management and treatment of anaemia, the World Health Organization recommends the continuous use of insecticide treated nets and the administration of Sulfadoxine–Pyrimethamine (SP) starting from the second trimester until the time of delivery with a minimum interval of 4 weeks between each dose [3].

Antenatal care (ANC) is key strategy to reduce maternal and newborn deaths, and it is crucial in high malaria transmission areas. With a reported incidence of 445 malaria cases per 1000 inhabitants in 2017, Cabo Delgado is one of the most affected provinces in Mozambique [4]. In 2015 IPT2 coverage in the province was estimated at 48.6% and IPT3 at 25.8% [5]. According to national policy, SP is administered by health professionals during ANC services, mainly at facility level.

The burden of malaria and the death toll among pregnant women and newborn are highest among rural communities [6]. No data is available on equity of access to ANC facilities and to malaria prevention in pregnancy in northern Mozambique. In this study we explore whether socio-economic factors are associated with ANC uptake in health facilities in two Cabo Delgado rural districts.

Methods

Secondary analysis of a malaria project baseline survey was carried out. We conducted ANC exit interviews and a community survey in 8 rural health centres and respective catchment areas in Montepuez and Balama districts. A representative sample of women living in the catchment areas of the 8 health facilities was obtained through a two stage proportional to size sampling. The sample size was calculated accordingly to the primary study objective to estimate baseline project indicators. In the health facility surveys, all pregnant women attending the ANC services were interviewed during a one-day visit in each health centre in the study area. The community representative sample of women 15-49 years old with a pregnancy in the last 5 years (n=168) was compared to a sample of pregnant women (n=75) attending ANC services in the health centres of reference. Wealth status was calculated from household assets, roofing material and source of lighting by using principal component analysis [7]. Adjusted ORs of socio-economic factors associated with access to ANC facilities were estimated through multivariable logistic regression using Svysset commands in STATA. The baseline assessment was authorised by district and provincial authorities. All study participants provided an informed consent. Data were entered and analysed in anonymous form.

Results

Baseline socio-demographic characteristics of women attending ANC facilities and women from catchment area communities are illustrated in Table 1. Women from the community sample were on average older than

women interviewed in health facilities (median 26 years, IQR 21-32 compared to 23 years, IQR 18-29), consistent with the inclusion criteria for the community and the ANC facility surveys.

Results from bivariate and multivariate analysis are shown in Table 2. The educational level was higher among women attending ANC services (crude OR 1.98, 95% CI 1.02-3.86, $p=0.045$), though the association was not statistically significant when adjusted for socio-economic covariates. Higher wealth status was an independent factor associated with the access to ANC facilities (adjusted OR 2.24, 95% CI 1.04-4.81; $p=0.040$). Among women living in the health facilities' catchment areas, those from the wealthiest households were twice as likely to attend ANC facilities compared to women from lower socio-economic status.

Table 1. Baseline characteristics of women attending ANC facilities compared to origin population from communities. Montepuez e Balama districts. 2017

Socio-demographic characteristics	Community sample (n=168)			ANC sample (n=75)		
	n	%	(95% CI)*	n	%	(95% CI)*
Age (years)						
≤ 17	7	4.2	(1.3-7.1)	18	24	(15.0-33.0)
18-39	146	87.4	(82.6-92.2)	55	73.3	(64.5-82.2)
≥ 40	14	8.4	(4.4-12.3)	2	2.7	(0.1-8.2)
Educational level						
Never attended school or incompleting primary	112	66.7	(57.2-76.1)	39	52.0	(39.9-64.1)
Completed first level primary school (5th class)	42	25.0	(16.6-33.4)	29	38.7	(28.3-49.0)
Completed primary and above (≥6th class)	14	8.3	(4.8-11.9)	7	9.3	(1.9-16.7)
SES						
Poorer	117	73.6	(63.3-83.8)	42	56.0	(45.0-67.0)
Wealthier	42	26.4	(16.2-36.7)	33	44.0	(33.0-55.0)

*adjusted for study design

Table 2. Socio-economic factors associated with access to ANC facilities (n=233). Montepuez e Balama districts. 2017

Socio-demographic characteristics	OR crude	(95% CI)	p-value*	OR adjusted**	(95% CI)	p-value*
Age (years)						
≤ 17	1	-	-	1	-	-
18-39	0.15	(0.06-0.35)	< 0.001	0.15	(0.06-0.41)	0.001
≥ 40	0.06	(0.01-0.60)	0.02	0.06	(0.01-0.60)	0.019
Educational level						
Never attended school or incompleting primary	1	-	-	1	-	-
Completed first level primary school (5th class)	1.98	(1.02-3.86)	0.045	1.34	(0.70-2.59)	0.357
Completed second level primary and above (≥6th class)	1.44	(0.50-4.15)	0.485	0.95	(0.30-2.97)	0.925
SES						
Poorer	1	-	-	1	-	-
Wealthier	2.19	(1.10-4.37)	0.028	2.24	(1.04-4.81)	0.040

* adjusted Wald test

** Adjusted for all variables

Discussion

Findings from our study suggest that in rural districts of Cabo Delgado Province the access to antenatal services in primary health care facilities is not equitable. Poorer pregnant women are less likely to attend antenatal care facilities in Balama e Montepuez districts compared to the wealthier women from the same

geographical area. This affects all preventive interventions in pregnancy, including IPT. Thus the poorest are likely to have lower coverage of IPT in pregnancy, reducing malaria protection for women and their unborn babies. Our findings on inequitable access to maternal services are consistent with previous studies in rural sub-Saharan Africa and are relevant for the current policy of universal health coverage [8-11].

This study has some limitations. Firstly, results are based on a secondary analysis of two small size datasets. Statistical power might not be sufficient to detect significant differences between the two women groups. Another limitation is the number and type of variables included in the principal component analysis which might have resulted in miss-classification of socio-economic category. Lastly, household information collected at facility level could not be visually confirmed during the interview and might have been influenced by social desirability.

Conclusions

Strategies to bring ANC services closer to the rural poor must be considered to increase equity in antenatal services and to reduce the burden of malaria in pregnancy. As mitigation strategies to fill the equity gap in rural contexts, we advocate the intensification of mobile health clinics and the decentralization of selected antenatal services to community health workers, including the administration of following SP doses to eligible pregnant women.

Further studies are needed to explore IPT coverage in lower SES groups and the impact of targeted interventions.

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