

Full Length Research Paper

Determinants of community based maternal health care service utilization in South Omo pastoral areas of Ethiopia

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This paper examines the impact of community based integrated primary health care interventions on maternal health care service utilization in pastoral areas of Ethiopia. We examined empirically whether maternal health service utilization is influenced by individual's age, education, family size, marital status, age at first marriage, religion, availability of qualified medical personnel and the time required to travel to the nearest health facility. Data was collected on individual, household and village level predictors of the use of maternal health services using structured questionnaire. The data was analysed using logistic regression to examine the role of individual, household and community level predictors on the use of maternal health services. The use of antenatal care services, TT immunization, insecticide treated mosquito nets and family planning services have increased in the study districts. Implementation of health extension, outreach programs, aligning immunization with pastoral life style and the work habit have played a key role to the improved maternal and child health service utilization in study districts. Results of econometric estimation suggest that more maternal education and an increase in attendance at birth by skilled personnel could contribute to increased maternal health service utilization.

Keywords: Community based integrated primary health care, maternal health care, antenatal care, Ethiopia.

INTRODUCTION

Africa has the highest burden of maternal mortality in the world and sub-Saharan Africa is largely responsible for the dismal maternal death figure for the region, contributing approximately 98% of the maternal deaths for the region (Babalola and Fatusi, 2009). Ethiopia is one of the major contributors to the poor maternal health status in Africa. Ethiopia is one of the six countries that contribute about 50% of the maternal deaths; the others being India, Nigeria, Pakistan, Afghanistan and the Democratic Republic of Congo (Hogan, Foreman et al. 2010). The maternal mortality ratio is estimated at 673 per 100,000 live births according to the Demographic and Health Survey conducted in 2005 (Mesganaw 2010). Health services and facilities are particularly inadequate

and poorly equipped in remote pastoral areas of South Omo, Afar and Somali regions of Ethiopia. Health services are scarce, inaccessible, and inappropriate to the pastoral way of life. The few health centers that exist are not adequately supplied with basic medicaments, equipments and supplies. Trained health workers, especially physicians and midwives are in scarce supply across the country, and the distribution is skewed to cities (Mesganaw, 2010). In the absence of a concerted effort to ensure health systems reach disadvantaged groups more effectively; such inequities are likely to continue. A continuum of care for maternal, newborn, and child health services is needed. Health-service infrastructure, including human resources and essential drugs has to be strengthened in order to improve the use of primary health-care services.

Pursuant to the United Nations Millennium Development Goal of reducing maternal mortality by three quarters by the year 2015 in developing countries

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(MDG 5), Ethiopia has prioritized improving women's access to maternal health care as a key target. There are concerted efforts by Ethiopian government and non-governmental organizations to improve health services in pastoral areas over the last few years. Efforts are underway to move services out from facilities to the household and village level. The government has launched health extension program (HEP) in 2003 to improve equitable access to promotive, preventive and select curative health interventions through community or kebele¹ based health services (Karim, W Betemariam et al., 2010). More than 30,000 female health extension workers (HEWs) have been trained and deployed in rural areas to provide families with basic health care and frontline referrals for clients with complications to health facilities. In line with government's priority, The African Medical and Research Foundation (AMREF) in Ethiopia has been implementing Pastoralist Health Care Systems Strengthening Projects in South Ari and Malle Districts of South Omo Zone since January 2008. However, very little is known about the impact of community based integrated primary health care interventions on maternal health care service utilization in remote pastoral areas in Ethiopia.

In this paper we examine the effect of community based integrated primary health care interventions on maternal health care service utilization in South Omo pastoral areas of Ethiopia. More specifically, this paper examines whether maternal health service utilization is influenced by individual's age, education, family size, marital status, age at first marriage, religion, availability of qualified medical personnel and the time required to travel to the nearest health facility. Given that reducing high level of maternal mortality is at the top of Ethiopia's development agenda, determining the factors affecting maternal health use is crucial. Insights on the major factors that affect maternal health care utilization will help targeting interventions on factors with high impact on reducing maternal death in pastoral areas.

MATERIALS AND METHODS

Study area, sampling and data sources

The study focuses on South Ari and Malle Districts in South Omo Zone of the Southern Nations Nationalities and Regional State. This study uses survey data collected in March 2010 by AMREF to assess the effectiveness of 'Strengthening Pastoralist Health Care Systems Project' in South Ari and Malle districts. For the purpose of this research, the two districts were selected purposively as they represent the areas with major health intervention by the project. Three stage sampling strategy was followed. In the first stage, 30 percent of the total Kebeles in each district were included in the study. As the number of Kebeles varies in the two districts, we used

proportional sampling to give equal weights. We placed 70 percent weight to South Ari and a 30 percent to Malle in drawing the sample Kebeles (8 Kebeles from South Ari and 4 Kebeles from Malle) based on the total population size. Villages were randomly selected to choose the respondents. Since all the outcome indicators focus mainly on women and children, we interviewed women respondents for individual and household level information. In total, 408 sample females in the reproductive age group (15-49 years) were interviewed using structured questionnaire. Data was collected on the indicators of the use of maternal health services. Data was also collected on individual, household and village level predictors of the use of maternal health services.

Key informant interviews, focus group discussions and field observation were used to collect qualitative information. Health facility assessment was conducted using a checklist. In depth interviews were conducted with people who represent various demographic and socio-economic categories and who have rich experience and broad knowledge on health related issues in South Omo. Specifically, in-depth interviews were conducted with the representatives of district health office, health centre, women affairs and water office. Focus group discussions were held with women of reproductive age and health extension workers and health promoters using interview guidelines prepared in advance to assess the impact of the project. The observations of the reported changes on the ground were used to support other source of information.

Empirical model and variables

Based on theoretical propositions and empirical evidences, a women making at least 2 antenatal care visits to a health facility, a pregnant women receiving tetanus toxoid immunizations, delivery assisted by a trained medical personnel (doctor or nurse/nurse-midwife), children under 5 and pregnant women in malaria endemic district sleeping under an insecticide treated net, pregnant women offered counseling and testing for HIV and screened for STIs at ANC and a respondent receiving information on family planning/reproductive health were considered as important indicators of maternal health service use (Say, Souza et al., 2009; Atun, de Jongh et al., 2010; Hogan, Foreman et al., 2010). Shortages of midwives, nurses and doctors have influence on maternal health and health services in sub-Saharan Africa (Gerein, Green et al. 2006). Individual characteristics such as age, education, work status, religion and household income have a bearing on the use of maternal health services (McTavish, Moore et al., 2010; Woldemicael and Tenkorang, 2010). Physical accessibility also plays important role in the use of health services (O'Meara, Noor et al. 2009). The distance or time required to travel

Table 1. Mortality rates in different age groups

Mortality by age group in years	Malle %	South Ari %
nder 5 years	29	31
5-9 years	16	22
10-19 years	15	8
20-29 years	16	8
30-39 years	7	11
40-49 years	4	8
50+ years	13	11
N	69.0	36.0

is a crucial factor in the decision about whether and when to seek treatment. High risk and poor populations require proximal health services to improve health outcomes (Bryce J, Victora CG et al., 2005). Health system characteristics can also hinder health service uptake. But most community based health care services such as insecticide treated nets, basic medicines, ANC service, TT immunization, etc are given free of charge in rural Ethiopia.

We adopted utility maximization framework to model the perceived utility of maternal services by individual respondents. The random utility theory (Mc Fadden, 1974) enables formulating utility (U) as additive functions of deterministic and random components. This can be formulated as:

$$U_{ni} = X_{ni}\beta_n + \varepsilon_{ni} \quad (1)$$

Where, X_{ni} is a vector of explanatory variables explained in the conceptual framework, and ε_{ni} is unexplained utility assumed to be independently and identically distributed (iid) across individuals. β_n is a conformable vector of the unknown weights the respondent assigns to the explanatory variables.

Data analysis

The data was entered into Stata 11 (Stata Corp, 2009) and arranged for statistical analysis. Data was analysed using logistic regression to examine the role of individual, household and community level predictors on the use of maternal health services. The qualitative data collected through field notes and tape records were analyzed using thematic and interpretive approaches.

RESULTS

Analyses of descriptive information

Although Ethiopia is making progress towards the MDGs, improving maternal health (MDG 5) remained as a major challenge in SNNPR (Federal Ministry of Health, 2011).

Pastoralists in general and those in South Omo have historically been sidelined by development programmes, and are among the poorest people in Ethiopia, vulnerable to sudden drops in income or loss of assets. Accordingly, the area lags behind the national and regional status in maternal health services coverage. This sub-section discusses the progresses made in major maternal health outcomes in the study districts.

Child and maternal mortality

Very small percentages of respondents reported that they had experienced deaths in the household in the last one year. About 12% in South Ari and 13% of the respondents in Malle reported death in the household. Table 1 above shows the presence of heavy under-five mortality in the population. About 30% death was reported in both Districts among children under-five years of age. In Malle the highest death (40%) occurs among 10-19 years followed by children under 5 years of age. The result indicates that child mortality is still high in the districts in spite of the efforts made to tackle the predicament. Maternal mortality is relatively low in the districts.

ANC service utilization

Access to antenatal care has a significant impact on the health of the mother. Provision of adequate antenatal care is regarded as a cornerstone of maternal health care. The detection of high-risk pregnancies through antenatal care has been advocated as a good tool to reduce maternal mortality in developing countries. Coupled with the increase in the potential health service coverage, change in awareness level and enhancement in service quality, ANC service utilization has shown a remarkable improvement. Positive changes were noticed in this regard. About 84% of mothers in South Ari and 78% of mothers in Malle received at least two ANC services (Table 2). South Ari has shown better progress than Malle in ANC service utilization.

Table 2. Percentage of respondents who received ANC services during their last pregnancy

	South Ari	Malle
ANC service receipts (%)	37.2	34.6
Source of ANC service		
• Traditional Birth Attendant	5.6	17.3
• Health Facility	36.5	24.0

Table 3. Responses on the number of ANC services obtained by pregnant women

Number of ANC services received	South Ari (%)	Malle (%)
Once	8.66	7.32
Twice	20.47	14.63
Three times	14.17	24.39
Four times	20.47	24.39
Five and above	29.13	14.63
I don't remember	7.09	14.63

Table 4. Delivery services attended by skilled birth worker

	South Ari (%)	Malle (%)
Nobody was there	40	47
Family members	29	22
Health worker	13	6
Community health agent	1	1

The majority of woman in South Ari had access to the service in health facility and 24% of the woman in Malle also had the service from health facility. About 6% of woman in South Ari and 17% of the women in Malle received ANC service from traditional attendant.

In order to understand their health seeking behavior for ANC, questions were also asked about how many times they sought ANC care (Table 3). Frequency of ANC visit considerably benefits mothers in determining the delivery process and outcome and take the necessary measure before any complication occur. In this regard, mothers who made four visits are considered to attain better mother and child health benefits. About 21% of the mothers in South Ari made four visits and 29% of the mothers made five visits and more. In Malle District 24% of the mothers visited four times and 15% of the mothers visited five times and more.

Lack of appropriate delivery practice is one of the major challenges that contribute to the high maternal morbidity and mortality (Table 4). Skilled attendance is the best remedy for the mitigation of this health problem. In-depth interview with health extension workers (HEWs) and health workers revealed that pregnant women who came for delivery services after they had tried traditional

methods. They also revealed that the majority of the mothers trusted the traditional ones.

Tetanus Toxoid (TT) immunization coverage

The survey findings indicated that 67% percent of women in Malle and 83% percent in South Ari received Tetanus Toxoid (TT) immunization (Table 5). Among currently pregnant women, 83% have taken TT immunization and 53% have slept under ITN in South Ari District. In Malle 74% of the pregnant women were immunized and 90% of the pregnant women sleep under ITN. About 80% of women respondents in South Ari and 58% of women in Malle have taken TT immunization during their pregnancy.

Sexually transmitted infections (STIs)

Sexually transmitted infections such as gonorrhea, human papilloma virus, genital warts, syphilis, trichomoniasis, etc. increase the risk of HIV/AIDS transmission. In addition to other complications, STIs cause infertility (primary or secondary). Untreated STI could cause infertility and its effects are more damaging

Table 5. Percentage of women who have taken TT immunization during pregnancy

	District of the respondent			
	Malle		Ari	
	N	%	N	%
Yes	242	79.6	60	57.7
No	49	16.1	29	27.9
Total	304	100.0	104	100.0

Table 6. Use of family planning services by households

		District	
		South Ari	Malle
		(%)	(%)
Knowledge about types of family planning services	Injectables	87.6	80.0
	Pills	4.8	17.1
	IUD	0.7	
	Norplant	0.7	2.9
	Condom	1.4	
	Other	4.8	
Attend health facility for RH/FP services	Yes	66.7	47.7
	No	33.3	52.3
Are you currently using family planning method	Yes	36.2	40.3
	No	63.8	59.7
Method are you using for family planning	Injectables	94.3	81.5
	Pills	2.3	14.8
	Norplant	2.3	3.7
	Condom	1.1	

on women as compared to men. Data was collected from all women about the practice and knowledge of STIs. At the time of the survey, 42% of respondents in South Ari and 30% in Malle District have knowledge about STI. The awareness level is relatively low and efforts need to be made to raise awareness on STI.

Family planning

The proper uptake of family planning (FP) services helps in regulating the fertility thereby bringing positive impact on the population growth of the country. The results of the community based survey depicted changes in the level of awareness and attitude towards family planning. The discussions with District health office head revealed that there is a gap between family planning knowledge and utilization. This was further confirmed by FGDs held with women and men at South Ari who acknowledged the receipt of information about FP from HEWs and discussed in their cell groups organized by KHMCS. Women FGDs participants who had children more than

five regretted that the family planning services reached late. The women explained that some husband opposed using FP because they think wives will not obey if they stop giving birth. One of the major reasons for having many children was polygamy which is the major HTP in the Districts. This indicates that family planning awareness to be given both to women and men counterparts.

The number of women using family planning method is relatively good both in South Ari and Malle (Table 6). The majority of women use injectables followed by pills in South Ari and Malle Districts.

Harmful traditional practices

There are harmful traditional practices that affect the health of women negatively in the two Districts (Table 7). The practice of Uvelectomy/tonsillectomy, abduction and early marriage were high in South Ari and Malle Districts. Milk teeth extraction is extensively practiced in both South Ari and Malle.

Table 7. Percentage of responses on common harmful traditional practices

HTP	South Ari (%)	Malle (%)
Female genital	7.8	1.3
Abduction	16.3	32.0
Early Marriage	13.3	32.0
Milk teeth extraction	98.9	93.3
Uvelectomy /tonsillectomy	44.8	1.3

Table 8. The effect of explanatory variables on the odds ratio of respondents using ANC service during respondent's last pregnancy in the last two years

Variables	Coefficients
Age	1.132*** (-0.376)
AgesSqr	-0.0236*** (-0.00783)
Education	0.169 (-0.215)
Respondent being a Christian	-0.229 (-0.158)
Household size	-0.058 (-0.15)
Number of children under 5	0.575** (-0.265)
Constant	-13.43*** (-4.338)
Observations	151
Pseudo R ²	0.111
P	0.000805
Chi ²	22.98

*** p<0.01, ** p<0.05, * p<0.1

Econometric results

Econometric analyses results for the specified models in the methodology are presented in this subsection. The results are presented in successive order starting from ANC service use through births attended by a health worker, using family planning, respondent's knowledge about STI; and respondent's using TT immunization during pregnancy.

Use of ANC services

Estimation results in Table 8 show that age and number of children under five had positive and significant impact on self-reported antenatal health care service utilization.

Women with newborn and recent pregnancy are more likely to visit health extension workers for reproductive, maternal and new born health. Women with high household size have relatively better exposure to the health extension service. However, we have also noted that the age square (exponential increase of age) is negatively correlated with ANC attendance, most probably due to anticipated lower risk with delivery experience. We found evidence that women with perceived risk and previous experience of pregnancy related complications are highly likely to attend ANC.

The impact of education on ANC service use is positive but insignificant. This is consistent to the findings of the EDHS which show that antenatal care is most common among women with higher than secondary education (Central Statistical Agency and ICF Macro, 2011).

Table 9. The effect of explanatory variables on the odds ratio of births attended by a health worker

Variables	Coefficients
Age	0.24 (-0.519)
Age at first marriage	0.865* (-0.447)
Education	0.570** (-0.283)
Respondent being a Christian	-0.570* (-0.329)
AgeSqr	-0.00483 (-0.0106)
Household size	-0.515** (-0.24)
Number of children under 5	0.801* (-0.474)
Constant	-4.08 (-5.927)
N	125
Pseudo R ²	0.134
P	0.022
chi ²	16.41
*** p<0.01, ** p<0.05, * p<0.1	

Delivery Assisted by trained health workers

Age at first marriage, education and number of children under five have positive and significant impact on mother's preference to use service of trained health workers during deliveries. Younger mothers are more likely to deliver in health facilities than their older counterparts. Young girls have relatively better exposure to education. Women in a larger household are less likely to deliver at health facilities. Mothers' educational status has highly influence on mother health seeking facility based assisted delivery by a health professional (Table 9). This is consistent with the findings of the DHS 2011 which indicates that 5 percent of births to mothers with no education were attended by a health professional and delivered in a health facility compared with between 70 and 72 percent of births to mothers with some secondary education (Central Statistical Agency and ICF Macro, 2011). Moreover, the findings indicate that higher family size is a result of repeated child bearing. This is consistent with the findings of the ANC which shows that number of children is negatively correlated with ANC. More importantly, we found that ANC is positively associated with skilled delivery attendance.

Use of family planning practices

Generally family planning methods are used either to limit

the number of children or to increase spacing between two consecutive births. In this case there is an implicit implication that it is a conscious effort by a couple to limit or space the number of children they have through the use of contraceptives. Therefore, use or none-use of family planning methods is dependent on both the demand and supply factors. Accordingly, decisions are affected by individual, social, economic, policy and spatial factors. The estimation results in Table 10 show that level of education has positive and highly significant effect on the use of family planning methods. The other variables included in the model have no significant explanatory power on the use of family planning methods.

Respondent's knowledge about STI

The number of children under five, level of education and the respondent being Christian had positive and significant effect the respondent's knowledge about STI (Table 11). The finding is pertinent to Christianity and the positive effect could be associated with the Christian teachings towards the current HIVAIDS epidemic. Although many studies indicate declining stigma and discrimination, most people still feel that HIVAIDS is a curse upon those who exercise spiritually unacceptable sexual behavior. Most discussions pertinent to STIs are usually hijacked by the HIVAIDS implications. In our study we found that education is a significant variable in this model and has a positive effect on the awareness

Table 10. The effect of explanatory variables on the odds ratio of respondents using family planning

Variables	Coefficients
Age	0.0101 (-0.0328)
Age at first marriage	0.0549 (-0.335)
Education	0.560*** (-0.196)
Household size	0.136 (-0.149)
Number of children under 5 years of age	-0.14 (-0.259)
Constant	-1.981** (-0.983)
*** p<0.01, ** p<0.05, * p<0.1	
N	199
Pseudo R ²	0.0384
P	0.0671
Chi ²	10.3

Table 11. The effect of explanatory variables on the odds ratio of respondent's knowledge about STI

Variables	Coefficients
Age	0.283 (-0.34)
Education	0.550** (-0.216)
Respondent being a Christian	0.371** (-0.148)
AgeSqr	-0.00561 (-0.00698)
Household size	0.0351 (-0.143)
Number of children under 5	0.679*** -0.262
Constant	-6.276
N	159
Pseudo R ²	0.0935
P	0.00246
Chi ²	20.29
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

about STI. In South Omo context, any association to education is most likely associated with exposure to towns and small urban centers due to the concentration of educational facilities in those locations. Most endeavors to fight against STIs and HIV are localized and target urban areas.

Use of TT immunization during pregnancy

Among the explanatory variables included in the model, only household size has positive and significant impact on respondent's use of TT immunization service during pregnancy (Table 12). The results imply that efforts need to be geared towards awareness level of women

Table 12. The effect of explanatory variables on the odds ratio of respondent's taking TT immunization during any of her pregnancy

Variables	Coefficients
Age	-0.0313 (-0.0317)
Respondent being a Christian	-0.311*** (-0.107)
Occupation	-0.117 (-0.0829)
Education	0.334 (-0.29)
Household size	0.280** (-0.12)
Constant	1.871* -1.041
N	284
P	0.0000
Chi ²	28.55
*** p<0.01, ** p<0.05, * p<0.1	

and the community through formal and informal education.

DISCUSSION AND CONCLUSIONS

The use of antenatal care (ANC) services, TT immunization, insecticide treated mosquito nets and family planning services are increasing in the study districts. Implementation of health extension, outreach programs, aligning immunization with pastoral life style and the work habit have played a major role to the improved maternal and child health service utilization in South Ari and Malle districts. The results from econometric estimation suggest that more maternal education and an increase in attendance at birth by skilled personnel could contribute to increased maternal health service utilization.

Limitation of the study and suggestions for future work

Generally, the estimation results confirm that households that have better education achievements are likely to use many of maternal health services. Ideally, distance to nearest health facility, number and qualification of health personnel and income of households should have been included in the regression models. But these variables were not collected during the survey and we could not include them in the model. Also data on postnatal care was not collected. Future research should aim to include household assets, distance to the nearest health facility, distance to district town, number and qualification of

health personnel, number of visits by health extension workers, value of crop produced and other relevant variables to the model and see their effect on maternal health care utilization.

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