Utilization of Maternal Health Care Services in Ethiopia

MEASURE *DHS+*

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ORC Macro
Calverton, Maryland, USA

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The 2000 Ethiopia DHS survey is part of the MEASURE *DHS*+ project designed to collect, analyze, and disseminate data on fertility, family planning, and maternal and child health. Additional information about the MEASURE *DHS*+ project may be obtained from MEASURE *DHS*+, ORC Macro, 11785 Beltsville Drive, Calverton, MD 20705 (telephone: 301-572-0200; fax: 301-572-0999; e-mail: reports@macroint.com; Internet: www.measuredhs.com).

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1 Introduction

The World Health Organization (WHO) estimates that 580,000 women of reproductive age die each year from complications arising from pregnancy, and a high proportion of these deaths occur in sub-Saharan Africa. The ratio of maternal mortality in the region is one of the highest in the world, reaching levels of 686 per 100,000 live births (World Bank, 1994a). Women play a principal role in the rearing of children and the management of family affairs, and their loss from maternity-related causes is a significant social and personal tragedy.

Studies demonstrating the high levels of maternal mortality and morbidity in developing countries and research identifying causes of maternal deaths have repeatedly emphasized the need for antenatal care and availability of trained personnel to attend women during labor and delivery (Fauveau et al., 1988; Fortney et al., 1988). The importance of tetanus toxoid injections given prior to birth to reduce neonatal mortality has been documented as well (Bhatia, 1989). Since a large proportion of maternal and neonatal deaths occur within the first few days after delivery, safe motherhood programs have recently increased their emphasis on the importance of postnatal care.

In Ethiopia, the levels of maternal and infant mortality and morbidity are among the highest in the world. The maternal mortality rate in 2000 was 816 per 100,000 live births, and the infant mortality rate was 113 per 1,000 (CSA and ORC Macro, 2001). One explanation for poor health outcomes among women and children is the nonuse of modern health care services by a sizable proportion of women in Ethiopia. Previous studies have clearly demonstrated that the utilization of available maternal health services is very low in the country. Several studies in the 1990s have shown that about 25 percent of Ethiopian women received antenatal care and less than 10 percent received professionally assisted delivery care (Belay, 1997; CSA, 1993; Mekonnen, 1998; Mengistu and James, 1996; Mesganaw et al., 1990).

Despite the fact that maternal health care utilization is essential for further improvement of maternal and child health, little is known about the current magnitude of use and factors influencing the use of these services in Ethiopia. This paper therefore aims to fill this gap using data from the 2000 Ethiopia Demographic and Health Survey (DHS).

The purpose of this study is to understand the current status of utilization of maternal health services in Ethiopia by elucidating the various factors influencing the use of these services in the country. It is hoped that the results of the study will improve policymakers' understanding of the determinants of maternal and child mortality and morbidity in the country and serve as an important tool for any possible intervention aimed at improving the low utilization of maternity care services in the country.

2 Review of Related Literature

A review of the literature suggests that in developing countries, the use of modern health care such as maternal health services can be influenced by the sociodemographic characteristics of women, the cultural context, and the accessibility of these services.

A number of sociodemographic characteristics of the individual affect the underlying tendency to seek care (Addai, 2000). In this regard, good examples are maternal age and parity, which have been examined as determinants of health care use repeatedly (Adekunle et al., 1990; Celik and Hotchkiss, 2000; Leslie and Gupta, 1989). The greater confidence and experience of the older and higher parity women, together with greater responsibilities within the household and for child care, have been suggested as explanatory factors for their tendency to use services less frequently (Kwast and Liff, 1988). Maternal education has also been shown repeatedly to be positively associated with the utilization of maternity care services (Addai, 2000; Addai, 1998; Akin and Munevver, 1996; Beker et al., 1993; Celik and Hotchkiss, 2000; Ferdnandez, 1984; Stewart and Sommerfelt, 1991). Although, in general, women in higher socioeconomic groups tend to exhibit patterns of more frequent use of maternal health services than women in the lower socioeconomic groups, factors such as education appear to be important mediators (Addai, 2000; Addai, 1998; Leslie and Gupta, 1989).

Another important factor in the utilization of maternity care services, especially in Africa, is the cultural background of the woman (Leslie and Gupta, 1989; Pelto, 1987). The cultural perspective on the use of maternal health services suggests that medical need is determined not only by the presence of physical disease but also by cultural perception of illness (Addai, 2000). In most African rural communities, maternal health services coexist with indigenous health care services; therefore, women must choose between the options (Addai, 2000). The use of modern health services in such a context is often influenced by individual perceptions of the efficacy of modern health services and the religious beliefs of individual women (Adetunji, 1991). Moreover, in many parts of Africa, women's decisionmaking power is extremely limited, particularly in matters of reproduction and sexuality. In this regard, decisions about maternal care are often made by husbands or other family members (WHO, 1998). Availability of women's time is also important. In developing countries, women spend more time on their multiple responsibilities for care of children, collecting water or fuel, cooking, cleaning, growing food, and trade than on their own health (World Bank, 1994a).

Accessibility of health services has been shown to be an important determinant of utilization of health services in developing countries. In most rural areas in Africa, one in three women live more than five kilometers from the nearest health facility (World Bank, 1994b). The scarcity of vehicles, especially in remote areas, and poor road conditions can make it extremely difficult for women to reach even relatively nearby facilities. Walking is the primary mode of transportation, even for women in labor (Williams et al., 1985; World Bank, 1994b). In rural Tanzania, for example, 84 percent of women who gave birth at home intended to deliver at a health facility but did not due to distance and lack of transportation (Bicego et al., 1997). Fees reduce women's use of maternal health services and keep millions of women from having hospital-based deliveries or from seeking care even when complications arise. Even when formal fees are low or nonexistent, there may be informal fees or other costs that pose significant barriers to women's use

of services. These may include costs of transportation, drugs, food, or lodging for the woman or for family members who help care for her in the hospital (Gertler and van der Gaag, 1988; Gertler et al., 1988).

In Ethiopia, studies addressing the factors influencing the utilization of maternity care services are scant. The few studies that do exist focused predominantly on urban areas and have identified some important determinants of use of maternity care services in the country. Kwast and Liff (1988), in their study of maternal mortality in Addis Ababa, showed that women who did not receive maternity care were often poor, illiterate, and unmarried, with limited knowledge of maternity care services. The study also showed that the risk of nonattendance was higher for pregnant women who were first pregnant between the ages of 10 and 18. In a nationally representative sample survey in Ethiopia, receipt of maternity care was found to vary by age, residence, and other sociodemographic factors (CSA, 1993). Another study in Addis Ababa showed that lack of time, absence of illness, and lack of awareness are the major reasons for nonattendance for antenatal care (Mesganaw et al., 1990). Mengistu and James (1996), in their study in the Arsi Zone of central Ethiopia, found maternal age, parity, lack of time, education, marital status, and women's economic status to be significant predictors of utilization of maternity care. A study in Yirgalem Town and in the surrounding Southern Nations, Nationalities, and People's Region (SNNPR) of Ethiopia showed that women's education, inadequate household income, and unwanted pregnancy were important predictors of antenatal care utilization (Belay, 1997). A large-scale community and family survey in SNNPR concluded that although a number of sociodemographic factors are important in urban areas, they are of less relevance in the rural part of the study area. Sociodemographic factors including parity, age, and education appeared to influence the use of maternity care services in urban areas. In contrast, distance and travel time were identified as important factors in the rural parts of the country (Mekonnen, 1998).

3 Data and Method of Analysis

The data for this study come from the 2000 Ethiopia Demographic and Health Survey, which was the first of its kind to be conducted in the country. The survey collected information from a nationally representative sample of 15,367 women age 15-49. This study analyzes responses from 7,978 women age 15-49, who have at least one child under age five at the time the survey was fielded.

The main focus is a number of specific questions asked of women about their most recent pregnancy and live birth in the five years preceding the survey. Women were asked 1) whether they were checked by a trained health professional, that is, doctor, nurse, or midwife, at least once during pregnancy, i.e., antenatal care (ANC); 2) whether they were attended by a trained health professional during their delivery, i.e., professionally assisted delivery (PAD); and 3) for those mothers who delivered outside a health facility, whether they received a medical checkup from a health professional within 42 days after delivery, i.e., postnatal care (PNC).

This analysis was not designed to test any formal theory of health-seeking behavior. Nevertheless, each of the independent variables was selected for inclusion in the analysis based on previous literature. Independent variables included in the present study were maternal age at birth, parity, number of children under five, educational status of women, marital status, work status, religion, residence, and year of birth of the child.

Method of Analysis

The unit of analysis for this study is women who had at least one live birth in the five years preceding the survey. If women had more than one live birth in the past five years, only care received for the most recent live birth is considered. Bivariate and multivariate analyses were carried out for the three maternal health care variables. For the multivariate analysis, the response category was collapsed to create a dichotomous variable on the basis of whether or not the woman had received maternal health care. Since the interest was in identifying women at risk because they did not receive care, the outcome variables were coded as 1 if the women received antenatal care and as 0 if she did not receive antenatal care. The same coding procedure was applied for delivery and postnatal care.

Logistic regression was used for the multivariate analysis. The logistic model considers the relationship between a binary dependent variable and a set of independent variables. The logistic model for K independent variables ($x_1, x_2, x_3, \ldots, x_k$) is given as:

$\text{logit } P(x) = \alpha + \Sigma ß_i x_i$

$\exp(\beta_t)$ = odds ratio for a person having characteristic *i* versus not having characteristic *i*

ß = Regression coefficient

α = constant

Confidence intervals (CIs) are presented for the odds ratios instead of p-values since the CI contains more information than p-values. A CI covering 1 implies that there is no effect of the

factor under consideration. Otherwise, there is an effect of that variable. A narrow CI implies a large sample size, while a large CI implies a small sample size.

The model was run for the country as a whole and separately for urban and rural areas since factors influencing use of maternal health services are expected to be different between urban and rural areas. At the same time, since Addis Ababa, the capital city, is different from other urban parts of the country, residence in Addis Ababa is considered separately. Parity in this study is categorized as 1, 2-4 and 5+ and is based on the fact that studies in Ethiopia (Kwast and Liff, 1988) and elsewhere have shown that the risk of maternal morbidity and mortality and other pregnancy-related complications are significantly higher among women with five or more children.

4 Results

Bivariate Analysis

Table 1 presents the results of the bivariate analyses of the use of maternal health care services in Ethiopia. Twenty-seven percent of women who had at least one birth in the five years preceding the survey received antenatal care from a doctor, nurse, or midwife for their most recent birth. The use of professionally assisted delivery service is very low in Ethiopia. Only 6 percent of women who delivered in the five years preceding the survey were assisted by a health professional for their most recent pregnancy. Even more striking is the fact that less than 3 percent of women who delivered outside a health facility received postnatal care. The bivariate results depict a significant variation in the use of maternal health care services by residence. Women from Addis Ababa are more likely to receive care from a doctor, nurse, or midwife than women from other urban areas or rural areas. Eighty-three percent of women in Addis Ababa received antenatal care, 71 percent received delivery care, and 19 percent received postnatal care. Utilization of maternal health care services is lowest in rural areas. Twenty-two percent of rural women received antenatal care, and 2 percent received delivery or postnatal care. Sixty-three percent of women from the other urban areas received professional antenatal care, 31 percent received delivery assistance, and 10 percent received postnatal care. The use of antenatal care is about 28 percent for women under the age of 35, while it is 21 percent for those over the age of 35. Furthermore, about twice as many women age 15-19 received delivery care from a health professional as women age 20 and above. However, there is little difference in utilization of postnatal care by age. Although there is little difference in utilization of antenatal care by marital status, unmarried women are more than twice as likely as married women to receive delivery assistance from a health professional. However, married women are more likely to receive postnatal care than unmarried women. Women's education is associated with use of maternal health care in Ethiopia, with the use of maternal health care increasing linearly with education. Seventy-two percent of women with at least secondary education received antenatal care from a health professional, compared with 45 percent of women with primary education and 21 percent with no education. A similar pattern is seen for delivery care and postnatal care. A mother's work status does not impact utilization of maternal health services to any great extent. This could primarily be because the reference period for work status is the 12 months prior to the interview and not in relation to a particular pregnancy or birth. There was significant variation in the utilization of maternal health care by religion. Orthodox/Catholic, Muslim, and Protestant women exhibit greater use of maternal health care services than women who follow traditional beliefs. For example, between 25 and 28 percent of the former group received antenatal care from a health care professional, compared with 11 percent of women from the latter group. Due to small numbers, this pattern is not as visible for use of postnatal care. Mothers with one live birth are more likely to use maternal health services for first births than for second and higher order births. Utilization of maternal health services is generally lower among mothers of birth order five and higher. Similarly, women who had only one birth in the past five years were also more likely to utilize maternal health care than women who had more than one birth in the same period.

Table 1 Percentage of women who had a live birth in the five years preceding the survey who received antenatal care, delivery care, or postnatal care from a health professional (doctor, nurse or midwife), by background characteristics

Background characteristic	Percentage who received antenatal care	Percentage who received delivery care	Number of women	Percentage who received postnatal care	Number of women[1]
Residence					
Rural	21.6	2.2	7,070	1.9	6,938
Other urban	63.4	30.5	760	9.6	564
Addis Ababa	83.1	71.1	148	19.0	42
Mother's age at birth					
15-19	28.8	11.0	1,016	2.9	943
20-34	28.0	6.4	5,310	2.5	5,008
35-49	21.3	4.6	1,652	3.2	1,593
Marital status					
Not married	26.5	12.5	785	2.2	692
Married	28.7	5.5	7,193	3.9	6,852
Education					
No education	21.0	2.5	6,550	2.0	6,403
Primary	45.0	12.1	1,003	4.4	904
Secondary and higher	71.7	48.2	425	14.4	237
Work status					
Not working	26.1	6.5	3,360	2.3	6,852
Working	27.6	5.9	4,618	3.9	692
Religion					
Orthodox/Catholic	27.5	8.1	4,117	2.8	3,814
Protestant	24.8	4.5	1,232	1.3	1,185
Muslim	28.3	4.3	2,338	2.3	2,255
Traditional	11.3	1.4	292	1.4	290
Children ever born					
1	31.9	13.8	1,362	2.9	1,184
2-4	29.2	5.8	3,264	2.0	3,093
5+	22.3	3.4	3,352	2.5	3,267
Births in the past 5 years					
1	29.0	8.5	4,260	2.7	3,927
2+	24.2	3.4	3,718	1.9	3,617
Total	26.7	6.2	7,978	2.7	7,544

Note: For women with two or more live births in the five-year period, data refer to the most recent birth.
[1]Based on women who delivered outside a health facility

Multivariate Analysis

Antenatal Care

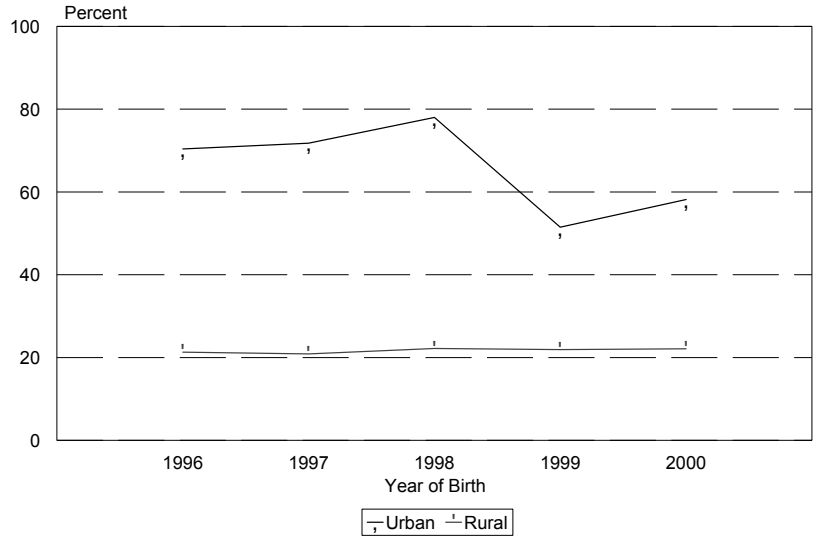
Results of the multivariate analysis for the country as a whole reinforce the importance of place of residence and women's education as the most important determinants of antenatal care utilization (Table 2). Women residing in Addis Ababa and in other urban areas are ten times and four times more likely, respectively, than women in rural areas to receive antenatal care from a health professional. Education is also an important determinant of antenatal care use, with women having at least secondary education four times more likely and women with primary education two and a half times more likely than women with no education to receive antenatal care from a health professional. Marital status and religion also exert an influence in determining antenatal care use. Married women are 40 percent more likely to receive antenatal care from a health professional than unmarried women. Muslim women are 30 percent more likely to receive professional antenatal care services, while women who belong to a traditional faith are 50 percent less likely to use ANC services than Orthodox or Catholic women. The multivariate analysis for urban areas identified a number of variables, including place of residence, marital status, women's education, parity, and year of birth of the child, as significant and independent predictors for the use of antenatal care services in urban Ethiopia. Women residing in Addis Ababa were two and a half times more likely to use antenatal care than women from other urban areas. The odds of using such services in urban areas were almost two and a half times higher among currently married women than among unmarried women.

Education continues to exert a strong and independent impact on utilization of antenatal care services in urban Ethiopia. Compared with women with no education, those with primary education were nearly two times more likely to use ANC services. Interestingly, the corresponding odds of using ANC services were about four times higher if these women attained at least secondary education. Regarding parity, the present study revealed that urban women with 2-4 children ever born were twice as likely to use antenatal care as women with only one child. In contrast, although high parity women (parity 5 or higher) tend to use the service more often than parity one women, the difference did not reach statistical significance. One striking finding was that the use of antenatal care services has declined over the five years preceding the survey in urban Ethiopia. Even after controlling for a number of variables in the model, it appears that the use of antenatal care decreased on average by 20 percent per year between 1996 and 2000, assuming a linear trend. Such a trend can be seen clearly in Figure 1, which shows that the use of ANC declined from 70 percent in 1996 to 58 percent in 2000.

Table 2 Adjusted odds ratios and 95 percent confidence intervals for receiving antenatal care from a medical professional

	Urban	Rural	Total
Residence			
Rural	-	-	1
Other urban	1	-	4.1[3.1-5.5]
Addis Ababa	2.5[1.6-3.8]	-	9.9[7.1-13.8]
Age at birth			
15-19	1	1	1
20-34	0.7[0.3-1.9]	0.9[0.7-1.4]	0.9[0.6-1.3]
35-49	0.9[0.3-2.9]	0.9[0.6-1.4]	0.9[0.6-1.4]
Current marital status			
Not Married	1	1	1
Married	2.4[1.3-4.1]	1.2[0.9-1.7]	1.4[1.1-1.9]
Education			
No education	1	1	1
Primary	1.7[1.0-3.0]	2.6[2.1-3.3]	2.5[2.0-3.1]
Secondary +	3.8[2.1-6.9]	3.9[2.3-6.7]	4.0[2.7-5.9]
Work status			
Not working	1	1	1
Working	1.1[0.7-1.8]	1.0[0.9-1.2]	1.0[0.9-1.2]
Religion			
Orthodox/Catholic	1	1	1
Protestant	0.9[0.4-1.9]	1.0[0.8-1.3]	1.0[0.8-1.2]
Muslim	0.8[0.5-1.4]	1.4[1.2-1.7]	1.3[1.1-1.6]
Traditional	-	0.6[0.3-0.9]	0.5[0.3-0.8]
Children ever born			
1	1	1	1
2-4	2.0[1.1-3.9]	1.0[0.7-1.3]	1.1[0.9-1.4]
5+	1.4[0.6-3.4]	0.9[0.6-1.2]	0.9[0.7-1.3]
Birth in the past 5 years			
1	1	1	1
2+	0.6[0.3-1.1]	0.9[0.7-1.1]	0.9[0.7-1.1]
Year of birth			
(1 year increase)	0.8[0.7-0.9]	1.0[0.9-1.1]	1.0[0.9-1.1]

Figure 1
Antenatal care



On the other hand, the model for the rural area identified few, but interesting, variables as independent predictors of use of antenatal care in the area. Independent predictors for the rural sample included marital status, maternal education, and religion. The effect of both marital status and education followed a similar direction as documented for the urban sample, although marital status has a weaker effect in the rural areas. Married women residing in rural areas are 20 percent more likely to use antenatal care than their unmarried counterparts. Maternal education also has a positive effect on the utilization of antenatal care in rural Ethiopia. The odds of using this service are more than two and half times higher for women with primary education than for women with no education. The corresponding odds are about four times higher if women attained at least secondary education. Unlike the results for the urban sample, religion stood out to be an independent predictor for the utilization of antenatal care services in rural Ethiopia. Compared with Orthodox/Catholic women, Muslim women are nearly one and a half times more likely to utilize antenatal care services. In contrast, women who followed a traditional belief system are less likely to use the service than any other religious group. Such women are 40 percent less likely to use the service than Orthodox/Catholic women. On the other hand, there is comparable likelihood of using the service among Orthodox/Catholic and Protestant women.

Delivery Care

Table 3 presents the results of the multivariate analyses of the use of delivery care services. Although professionally assisted delivery service is low in Ethiopia, there is substantial variation in the use of PAD by residence, parity, education, religion, and marital status. The results of the multivariate analysis for the overall sample show that place of residence, women's education, parity, and number of children under five are independent predictors of utilization of delivery care services in Ethiopia. The extent of variation in the use of delivery care services by residence is striking. Women residing in Addis Ababa are about 40 times more likely to receive assistance

during delivery than rural women, while women from other urban areas are about nine times more likely to receive assistance during delivery than rural women. Women's education appears to positively and independently predict the use of delivery care services in Ethiopia. The odds ratio for receiving professionally assisted delivery care for women with primary and at least secondary education compared with women with no education is 3.4 and 8.2, respectively. The table also shows that professionally assisted deliveries to mothers is inversely related to women's parity, which is in contrast to the observed pattern for antenatal care. Women with more than one child are 50 percent less likely to receive professional delivery care than parity one women.

Another interesting finding is that women with two or more children under five are 40 percent less likely to receive professionally assisted delivery services than women with only one child under age five.

The model for the urban sample shows that the use of delivery care services is significantly shaped by place of residence, women's education, number of children under five, and year of birth. Accordingly, women from Addis Ababa are about five times more likely to receive delivery care from a health professional than women from other urban areas. Women's education is also found to be an independent predictor of utilization of delivery care services in urban Ethiopia, with the highest odds of utilization documented among women with at least secondary education (seven times higher), followed by women with primary education (two times higher), compared with women with no education. The number of children under age five is one of the most important predictors of delivery care utilization in urban Ethiopia. The present analysis shows that urban women with two or more children under age five are 60 percent less likely to use PAD services than women with only one child under age five at the time of the survey.

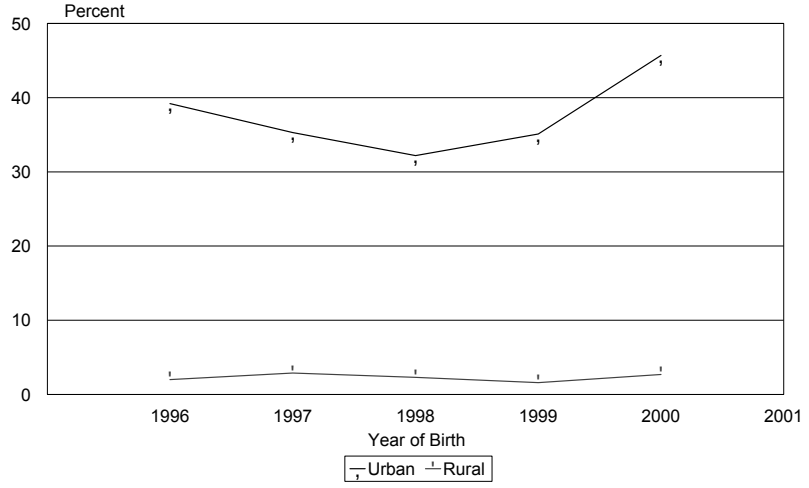
Utilization of professional assistance at delivery in urban Ethiopia is estimated to have increased over the last five years by 20 percent per year between 1996 and 2000, assuming a linear trend. The observed trend can be seen in Figure 2. This contrasts with the trend seen for antenatal care.

Only two variables were identified as independent predictors of utilization of delivery care services utilization in rural Ethiopia. Consistent with findings for the urban areas, women's education is a significant and independent predictor of utilization of delivery care services in rural Ethiopia. As expected, women with no education are less likely to use PAD services. The odds of utilizing such services are four and a half times and eight times higher for women with primary and secondary or higher levels of education, respectively, when compared with women with no education. Another important and independent predictor of utilization of delivery care services in rural Ethiopia is parity. Women with 2-4 and 5+ children are 60 percent and 50 percent less likely, respectively, to receive delivery care than parity one women. This is in contrast to what was seen for antenatal care.

Table 3 Adjusted odds ratios and 95 percent confidence intervals for receiving professionally assisted delivery care

	Urban	Rural	Total
Residence			
Rural	-	-	1
Other urban	1	-	8.5[5.8-12.4]
Addis Ababa	4.8[3.2-7.0]	-	39.6[26.6-58.5]
Age at birth			
15-19	1	1	1
20-34	0.6[0.2-1.4]	0.7[0.3-1.4]	0.6[0.4-1.1]
35-49	1.0[0.3-3.3]	0.8[0.3-2.4]	0.9[0.4-2.1]
Current marital status			
Not Married	1	1	1
Married	1.2[0.7-2.3]	0.8[0.4-1.5]	1.0[0.6-1.5]
Education			
No education	1	1	1
Primary	2.3[1.3-4.1]	4.6[2.7-7.9]	3.4[2.2-5.1]
Secondary +	7.2[4.1-12.5]	8.2[3.7-18.3]	8.2[5.2-12.9]
Work status			
Not working	1	1	1
Working	1.1[0.7-1.8]	0.9[0.6-1.5]	1.0[0.7-1.4]
Religion			
Orthodox/Catholic	1	1	1
Protestant	0.5[0.2-1.2]	1.0[0.5-1.8]	0.8[0.6-1.3]
Muslim	0.8[0.4-1.5]	1.0[0.6-1.7]	0.9[0.6-1.3]
Traditional	-	0.7[0.2-2.7]	0.5[0.1-1.8]
Children ever born			
1	1	1	1
2-4	0.7[0.4-1.3]	0.4[0.2-0.7]	0.5[0.3-0.8]
5+	0.5[0.2-1.0]	0.5[0.2-1.0]	0.5[0.3-0.9]
Birth in the past 5 years			
1	1	1	1
2+	0.4[0.2-0.8]	0.9[0.5-1.7]	0.6[0.4-0.9]
Year of birth			
(1 year increase)	1.2[1.0-1.5]	0.9[0.8-1.2]	1.1[0.9-1.3]

Figure 2
Delivery care



Postnatal Care

Multivariate analysis of the influence of variables on utilization of postnatal care by mothers who delivered outside a health facility shows that residence and education are the only factors that significantly influence its use in Ethiopia (Table 4). Women residing in Addis Ababa are eight times more likely to use PNC services than their rural counterparts. The corresponding odds ratio for women from other urban areas is 4. On the other hand, educated women with at

Table 4 Adjusted odds ratios and 95 percent confidence intervals (CI) for receiving postnatal care

	Total
Residence	
Rural	1
Other urban	3.9[2.3-6.9]
Addis Ababa	7.9[4.1-15.4]
Age at birth	1
15-19	0.7[0.3-1.9]
20-34	0.9[0.3-2.8]
35-49	
Current marital status	
Not married	1
Married	1.0[0.5-1.9]
Education	
No education	1
Primary	1.4[0.8-2.6]
Secondary +	3.8[1.8-7.9]
Work status	
Not working	1
Working	0.8[0.5-1.3]
Religion	
Orthodox/Catholic	1
Protestant	0.5[0.2-1.2]
Muslim	0.9[0.6-1.5]
Traditional	0.7[0.2-2.9]
Children ever born	
1	1
2-4	0.7[0.3-1.5]
5+	1.0[0.4-2.1]
Birth in the past 5 years	
1	1
2+	1.2[0.6-2.5]
Year of birth	
(1 year increase)	0.8[0.6-1.0]

least secondary schooling are four times more likely to use postnatal care than women with no education. Due to the small number of postnatal care users, no separate analysis by residence is presented. Observed trends can be seen in Figure 3.

Figure 3
Postnatal care

5 Discussion

This report is based on the first Demographic and Health Survey conducted at the national level in Ethiopia. The data used for this analysis are unique in terms of content, geographic coverage, and timeliness compared with previous studies on the use of maternal health services in the country.

The study shows that the coverage of maternity care services is very low in Ethiopia, as previously documented elsewhere in the country (Belay, 1997; CSA, 1993; Mekonnen, 1998; Mengistu and James, 1996; Mesganaw et al., 1990). Only about 27 percent, 6 percent, and 3 percent of women received professionally assisted antenatal, delivery, and postnatal care services, respectively, in the five years preceding the survey. Such levels of service coverage are considered low even by sub-Saharan standards. The results of Demographic and Health Surveys conducted in other sub-Saharan countries show coverage of antenatal care ranging from 35 percent in Niger to 90 percent in Kenya. Delivery care utilization ranges from a low of 15 percent in Niger to 69 percent in Zimbabwe (Stewart et al., 1997). The observed higher coverage for antenatal care compared with both delivery and postnatal care is consistent with other studies done elsewhere (Adekunle et al., 1990; Belay, 1997; Leslie and Gupta, 1989; Mekonnen, 1998; Stewart et al., 1997; UNICEF, 1989). The lower coverage for delivery and postnatal care has often been attributable to the unpredictability in the onset of labor and the difficulty of travel, particularly for long distances, during labor, during delivery, and even within a few days after delivery. Moreover, the relatively high cost of delivery care is often blamed for the low rate of utilization of delivery services.

The major objective of this report was to examine factors that significantly shape the use of maternity care services in Ethiopia. Most of the factors investigated are related to the demographic and sociocultural characteristics of women. The study has identified several factors that have important influence on utilization of maternal health services in Ethiopia. These include place of residence, women's education, marital status, religion, parity, and number of children under five. Place of residence and education are common predictors for the utilization of all the three maternity care services. Marital status and religion are important only for the utilization of antenatal care. On the other hand, parity is an important predictor of antenatal care only for the urban areas, while it is important for the utilization of delivery care for the entire country. Most of these findings are consistent with previous studies (Belay, 1997; Mekonnen, 1998).

The reason for the high level of utilization of maternal health services among urban women compared with their rural counterparts is easily understood. As in most sub-Saharan countries, urban women in Ethiopia tend to benefit from increased knowledge and access to maternal health services compared with their rural counterparts. This is because, health facilities are more accessible in urban areas and the various health promotion programs that use urban-focused mass media work to the advantage of urban residents and explain the close connection between urban residence and use of maternal health services. Moreover, rural women are more readily influenced by traditional practices that are contrary to modern health care.

The finding of a strong education effect is consistent with findings from elsewhere in the world (Addai, 2000; Addai, 1998; Akin and Munevver, 1996; Becker et al., 1993; Belay, 1997;

Celik and Hotchkiss, 2000; Ferdnandez, 1984; Mekonnen, 1998; Stewart and Sommerfelt, 1991). There are a number of explanations for why education is a key determinant of health service use. Education is likely to enhance female autonomy so that women develop greater confidence and capability to make decisions about their own health (Caldwell, 1981; Raghupathy, 1996). It is also likely that educated women seek out higher quality services and have greater ability to use health care inputs that offer better care (Celik and Hotchkiss, 2000).

Interestingly married women are more likely to use antenatal care than their unmarried counterparts. Although marriage is universal in Ethiopia, about 10 percent of births in the present study occurred among women who were not married. This group is largely composed of female-headed households. The stigma associated with out-of-wedlock pregnancies could be severe in societies like Ethiopia. It therefore seems reasonable to assume that most such pregnancies are unwanted or unintended. Moreover, women with unwanted pregnancies may initially attempt to deny their pregnancies to themselves and to conceal them from others. As a result such women become less motivated to seek antenatal care compared with their married counterparts.

One interesting finding of the present study is that religion has emerged as an important predictor of antenatal care utilization in rural Ethiopia. This result is consistent with previous reports in the country and elsewhere in Africa (Addai, 1998; Mekonnen, 1998). The negative influence of traditional religion in rural areas may be attributable to the traditional spiritual explanation of events, including diseases. Traditional perception of events may tie followers to the use of traditional medicine and encourage use of formal systems only when the traditional option fails. However, we can expect that some traditional beliefs obviously have negative effects on the use of modern delivery care services in the country. In this study, this was not seen, presumably because of the small numbers of women believing in traditional religions.

The effect of parity differs for antenatal and delivery care services. This study shows that among urban women, utilization of antenatal care is higher for those with two or more children than for those with only one child. On the other hand, utilization of delivery care services is lower for those with two or more children than those with one child. While it is unclear why urban women who have just started childbearing are less likely to seek antenatal care than middle parity women, a possible explanation for the low utilization of delivery care services among high parity women is that such women developed confidence and may believe that modern health care is not as necessary due to the experience and knowledge accumulated from previous pregnancies and births. Also, most of the high parity women live in rural areas. With respect to the effect of parity on the utilization of delivery care, the results appear to be consistent with most studies done elsewhere, which indicate that women are significantly more likely to use delivery care services for their first child than later children (Adekunle et al., 1990; Akin and Munevver, 1996; Leslie and Gupta, 1989; Mekonnen, 1998; Stewart and Sommerfelt, 1991). One possible explanation for this is that women who are pregnant with their first child are usually more likely to have difficulties during labor and delivery than women of high parity. This may result in low parity women being more motivated to deliver in medical facilities than high parity women.

Despite the difficulty in exploring trends in the utilization of maternity care services using cross-sectional surveys, this was attempted. In general, coverage for utilization of maternity care services (antenatal, delivery, postnatal) shows a consistent trend over the past six years at the

national level. However, a somewhat puzzling result is seen in urban areas. Although antenatal care from health professionals has declined over the years, the reverse is true for utilization of delivery care services in urban Ethiopia. These findings persist in the multivariate analysis even after controlling for a number of confounding factors. This finding may be of interest to policymakers working in the field of reproductive health in Ethiopia. Comparison of the trends observed in this study with those documented in other health services reports would be of considerable interest.

Finally, several strengths of the survey deserve mention: the large sample size; the meticulous data collection, which meant there were very few inconsistent or unknown values; and the fairly detailed information about use of maternal health services. In contrast, the data suffered from a number of limitations that must be noted. First, the survey did not collect information on service availability/accessibility, thus limiting the practical utility of the results, especially in the rural parts of the country where service factors are an important deterrent of use of maternity care. Second, since the question on the use of maternal health services focused only on the most recent pregnancy/birth in the five years preceding the survey, it was not possible to investigate behavioral consistency in the use of these services between successive births from the same woman. Third, for some women, the motives behind attending antenatal care could be in relation to a health problem rather than for preventive reasons. Since questions on reasons for seeking "care" during pregnancy were not included in this survey, it is difficult to distinguish between antenatal and curative care during pregnancy.

6 Conclusion and Policy Implications

In conclusion, this study demonstrates that the utilization of maternal health care services is inadequate in Ethiopia, as clearly depicted by the major maternal health care indicators (antenatal, delivery, and postnatal care services). The situation is worst in the rural areas, where more than 80 percent of the population resides. This study shows that the most important factors influencing the use of maternal health services in Ethiopia are demographic and sociocultural in nature. However, this does not detract from the relevance of service-related factors, especially in the rural areas. The demographic and sociocultural factors identified in this study include maternal education, marital status, place of residence, parity, and religion, which are similar to those documented in many settings throughout Africa and other developing countries. Such findings can therefore be used as the basis for a number of policy recommendations.

First, that education was found to have an important impact on the use of maternal health services suggests that improving educational opportunity for women may have a large impact on improving utilization of such services. This is, however, a long-term investment. As an alternative, in the short term, health programs need to focus on attracting women with little or no education. Second, that women at higher parity levels were found to be less likely to have deliveries assisted by modern professionals implies that parity should be one of the criteria for targeting education campaigns on the benefits of safe motherhood programs. Third, that rural women were less likely to use the services means that maternal health care programs should be expanded and intensified in rural areas along with culturally appropriate education campaigns. Fourth, since women who are not married or in union are less likely to use the services, it is imperative to also target this group during education campaigns. Last, the negative impact of traditional religion on the use of maternal health services points to the need for research into aspects of traditional religion that discourage the use of such health services.

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