USAID
FROM THE AMERICAN PEOPLE

# DHS WORKING PAPERS

## Male Involvement in Maternal Health Care as a Determinant of Utilization of Skilled Birth Attendants in Kenya

Judith Nekesa Mangeni
Ann Mwangi
Samwel Mbugua
Vincent Mukthar

2013 No. 93

February 2013

This document was produced for review by the United States Agency for International Development.

DEMOGRAPHIC AND HEALTH SURVEYS

# Male Involvement in Maternal Health Care as a Determinant of Utilization of Skilled Birth Attendants in Kenya

Judith Nekesa Mangeni

Ann Mwangi [1]

Samwel Mbugua [2]

Vincent Mukthar [3]

ICF International

Calverton, Maryland, USA

February 2013

*Corresponding author:* Judith Nekesa Mangeni, Department of Community Health, Moi University, Eldoret, Kenya; Email: nakholi2001@yahoo.com

1. Department of Behavioral Sciences, Moi University;
2. Department of Human Nutrition, Egerton University;
3. Department of Nursing Sciences, Egerton University

**ACKNOWLEDGEMENTS**

We are very grateful to ICF International and USAID for funding us through the MEASURE DHS fellowship program. We thank the internal reviewers Dr. Stan Yoder and Dr. Soumya Alva for critically reviewing our paper a couple of times and guiding us with their very useful comments.

We extend our sincere gratitude to the facilitation team particularly Dr. Wenjuan Wang, Dr. Sarah Staveteig and Mr. Francis Kundu for their tireless dedication to teaching and guiding us on analysis of DHS data, as well as Bryant Robey for editing and Yuan Cheng for formatting.

Thanks are also due to the financial support by the United States Agency for International Development (USAID) for fellowship support through the MEASURE DHS project at ICF International Inc.

The *DHS Working Papers* series is an unreviewed prepublication series of papers reporting on research in progress that is based on Demographic and Health Surveys (DHS) data. This research is carried out with support provided by the United States Agency for International Development (USAID) through the MEASURE DHS project (#GPO-C-00-08-00008-00). The views expressed are those of the authors and do not necessarily reflect the views of USAID or the United States Government.

MEASURE DHS assists countries worldwide in the collection and use of data to monitor and evaluate population, health, and nutrition programs. Additional information about the MEASURE DHS project can be obtained by contacting MEASURE DHS, ICF International, 11785 Beltsville Drive, Suite 300, Calverton, MD 20705 (telephone: 301-572-0200; fax: 301-572-0999; e-mail: reports@measuredhs.com; internet: www.measuredhs.com).

**ABSTRACT**

**Objective**: To determine whether there is a relationship between male involvement in maternal health and utilization of skilled birth attendants (SBAs) after controlling for socio-demographic and maternal characteristics.

**Design**: Data from the Kenya Demographic and Health Survey (KDHS) conducted in 2008–09 were analyzed. We fitted an unadjusted logistic regression model and, to control for confounders, an adjusted binary logistic regression model to look for associations between utilization of an SBA, on one hand, and, on the other, socio-demographic characteristics of the woman, male perceptions about maternal health, and male attendance at an antenatal care (ANC) visit.

**Setting**: Nationally representative survey in Kenya.

**Subjects**: The unit of analysis was couples who met the inclusion criteria of being married and having had a child in the three years before the survey. To ensure that the couples were reporting on the same child, we picked couples who gave the same age for their last child. The final weighted sample size was 730 couples.

**Results**: The adjusted odds ratio after controlling for other factors indicates that women whose husbands attended at least one ANC visit were more likely to have skilled birth attendance than those whose husbands did not attend any ANC visits [AOR, 1.9; 95 percent CI, 1.09-3.32]. Maternal characteristics that had a statistically significant association with delivery by an SBA included educational level, employment, number of ANC visits, and parity. The province where the couple resided also was statistically significant.

**Conclusion**: In Kenya a male partner's participation, through attending ANC visits, is associated with a woman's use of an SBA during delivery.

**Keywords**: Skilled birth attendance, delivery in a facility, DHS, male involvement, antenatal care, maternal mortality rate, maternal health.

## INTRODUCTION

In 2010 there were an estimated 287,000 maternal deaths worldwide. Sub-Saharan Africa accounted for 56 percent of these deaths (WHO 2012). International commitment to lowering the maternal mortality rate (MMR), such as the safe motherhood initiative of 1987 and the Millennium Development Goals (MDG) of the 1990s, have propelled a decline of 47 percent in the global MMR between 1990 and 2010. Current global efforts, as embodied in MDG No. 5, which calls for reducing the MMR by 75 percent between 1990 and 2015 (WHO 2012). Factors credited with the decline in the MMR include improved care during pregnancy and delivery, a decreased birth rate, and greater education of women. Kenya, however, has been left out of this global trend. The last two Kenya Demographic and Health Surveys (KDHS), in 2003 and 2008-09, showed a persistently high MMR (CBS et al. 2004; KNBS and ICF International 2010).

Two indicators commonly used to assess care during pregnancy and delivery are antenatal care (ANC) and skilled birth attendance during delivery. In Kenya the percentage of pregnant women attending ANC visits has been high—88 percent in the 2003 KDHS and 92 percent in the 2008-09 KDHS. However, for maximal benefit at least four ANC visits are recommended. Between the two KDHS the percentage attending four or more ANC visits declined marginally, from 52 percent to 47 percent (CBS et al. 2004; KNBS and ICF International 2010).

In the literature evidence on whether ANC visits directly reduce the MMR is inconclusive (Berjsjø 2001; McDonalgh 1996; Rooney 1992). The recommendation is for ANC visits to start at the beginning of pregnancy, but most maternal deaths occur late in the third trimester and in the first week after delivery, largely due to obstetric complications. Thus, skilled birth attendance is directly linked to the MMR, as the SBA can quickly identify and manage or refer any obstetric complications that arise. Clearly, then, it is important to understand the determinants and dynamics of SBA use. In addition, the proportion of women attended by an SBA is commonly used as an indicator of progress towards MDG 5 (UNSTATS 2012).

Skilled birth attendance during delivery is considered a key strategy in the reduction of maternal deaths (WHO 2008). Unfortunately, the percentage of women in Kenya using SBAs has been low, and the 2003 and 2008-09 KDHS show very little improvement, from 42 percent to 44 percent. Among the reasons cited for these low levels are the low educational levels of

women, minimal awareness of the existence of and need for skilled birth attendance, as well as harmful traditional practices (NCPD 2010). Research finds three main domain factors that determine SBA use: demographic characteristics, health care and mothers' ANC visits, and spousal/male involvement.

Although men play a key role in the family as the main decision-makers, many studies on determinants of utilization of SBAs have focused largely on socio-demographic and maternal characteristics. Additionally, most of the efforts to address these determinants, and thus to increase uptake of maternal health services, have mainly addressed women. Little has been done to involve the male partner in maternal health.

Studies on male involvement in family planning have shown that men play a key role in family planning decisions, either through their direct participation or by enabling their partners to use contraception (Drennan 1998; Terefe and Larson 1993; Varkey et al. 2004). Further, a study conducted by the United Nations Population Fund (UNFPA) in Kenya found that husbands greatly influence women's decisions to use reproductive health services such as family planning (UNFPA 2009). With regard to maternity care, various studies emphasize how men's role can contribute to better outcomes for their pregnant wives (Drennan, 1998; Terefe and Larson 1993; UNFPA 2009; USAID 2010; Varkey et al. 2004).

In most families the men are empowered financially and are the main decision-makers in all issues including reproductive health. They may use this opportunity to ensure that their pregnant wives seek maternity services or arrange for skilled care during delivery, if delivery takes place at home. For men to make the right decision for their wives regarding place of delivery and professional attention, they need to understand the importance of maternal health care (Bhalerao et al. 1984; Mullany et al. 2007). There is a general agreement that men who know the danger signs of pregnancy are more likely to act fast to save the lives of their wives (Bhalerao et al. 1984; Cohen and Burger 2000). In Kenya most of this education is given to the mother—and her spouse, if he accompanies her—during ANC.

In this study we looked for an association between the utilization of an SBA and some form of male involvement, either direct attendance at ANC or a favourable perception of professional delivery care services. To date, few studies have tried to assess specifically whether male involvement influences men to ensure that their wives get professional attention during

pregnancy and delivery. Bringing out such an association clearly would be important for policy and program planning for maternal health care services. Using nationally representative data from the 2008-09 KDHS, our study sought to determine whether, after controlling for other factors, there is an association between male involvement in maternal health care and utilization of an SBA.

**Conceptual Framework**

The socio-demographic factors seen to influence SBA up-take in other developing countries include residential area, parity, financial status, mother's education, and access to transport (Abera et al. 2011; Choudhury and Ahmed 2011; Nketiah-Amponsah and Sagoe-Moses 2009; Wanjira et al. 2011). In Kenya studies have found that Western Kenya has the lowest level of use of SBAs (The Safe Motherhood Demonstration Project, Kenya 2003). One study conducted in this area attributed the high percentage of home deliveries to a combination of economic, geographical, cultural, and psychological reasons (Wabuge 2010). Studies on determinants of SBA utilization in other countries also have found marked geographical variations in utilization of SBAs (Maureen et al. 2008). Residence (rural-urban) has also been shown to be associated with utilization of SBAs; women in rural areas are less likely to utilize an SBA than are women in urban areas (Abera et al. 2011; Baral et al. 2010; Choudhury and Ahmed 2011; Letamo and Rakgoasi 2003; Mekonnen and Mekonnen 2003; Nketiah-Amponsah and Sagoe-Moses 2009; Onah et al. 2006; Wanjira et al. 2011). As might be expected, the poorest women are the least likely to utilize an SBA during delivery (Abera et al. 2011; Choudhury and Ahmed 2011; Falkingham 2003; Letamo and Rakgoasi 2003; Nketiah-Amponsah and Sagoe-Moses 2009; Thind and Banerjee 2004; Wanjira et al. 2011).

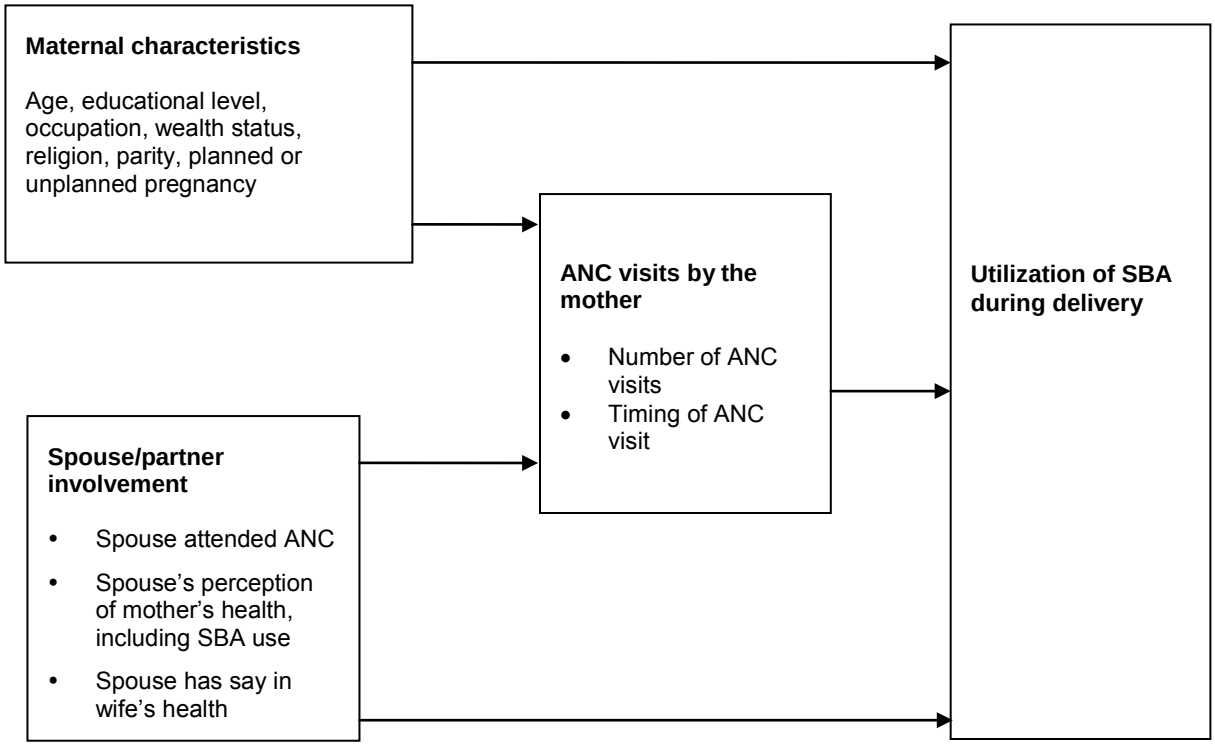
Maternal characteristics, especially higher education and employment, also are associated with the utilization of SBAs in delivery (Abera et al. 2011; Baral et al. 2010; Choudhury and Ahmed 2011; Letamo and Rakgoasi 2003; Maureen et al. 2008; Mekonnen and Mekonnen 2003; Nketiah-Amponsah and Sagoe-Moses 2009; Onah et al. 2006; Shah et al. 2010). For example, a systematic review of the literature on Nepal showed that women who were employed had a financial advantage and, therefore, were more likely to utilize SBAs during delivery (Baral et al. 2010). In Nigeria the mother's occupation was found to be associated with utilization of an SBA

(Onah et al. 2006). Parity has also been shown to be a determinant of SBA utilization. Women are more likely to have skilled birth attendants for the first birth than for later births (Baral et al. 2010; Gabrysch and Campbell 2009; Letamo and Rakgoasi 2003; Mekonnen and Mekonnen 2003; Onah et al. 2006). Health system factors associated with SBA utilization are place of last delivery, service provider's attitude, health facilities infrastructure, distance to a health facility, and knowledge of pregnancy risks (Essendi et al. 2010; Mpembeni et al. 2007).

Several studies have examined the role of men in influencing uptake of reproductive health services (Bhalerao et al. 1984; Cohen and Burger 2000; Greene et al. 1991; Mullany et al. 2007; Story et al. 2012). These studies define male involvement in terms of men's roles as clients of health care services, as partners, or as agents of positive change. Current literature indicates that the influence of male involvement on SBA uptake among women acts through husband's approval, agreement between spouses on the importance of delivery at a health facility, gender roles (perceiving services as being female-focused), men's knowledge of the relevance of their involvement, and traditional perceptions of delivery as exclusively a woman's concern (Biratu and Lindstrom 2007; Danforth et al. 2009; Kulunya et al. 2012).

There is no single widely used indicator for measuring male involvement. The DHS provide various data related to male involvement, including spouse's attendance at ANC and spouse's perceptions of his wife being attended by an SBA, of childbearing being only a woman's concern, and of a spouse having a say in his wife's health decisions. These variables are represented in the conceptual framework shown in Figure 1.

**Figure 1. Conceptual framework for determinants of skilled birth attendance during delivery**



## METHODS

This study uses data from the nationwide Kenya Demographic Health Surveys (KDHS) conducted in 2008-09. The KDHS provides a nationally representative sample of the Kenyan population and utilizes a two-stage stratified sampling design. In the first stage clusters are stratified by region and urban-rural location and randomly selected in proportion to population size. The second stage involves random selection of households within clusters.

Since our study focused mainly on male involvement in maternal health care and whether this influences utilization of an SBA during delivery, the unit of analysis was couples who had had a child in the three years prior to the survey. Men and women were asked separately about maternal care for the most recent birth during this period. To ensure that a husband and wife were reporting on the same birth, we restricted our analysis to couples who reported the same age of the last child. Of 873 couples that reported a birth in the three years before the survey, 737 couples (730 weighted) were thus eligible for our analysis (Appendix 1).

### Skilled Birth Attendant

A skilled birth attendant is an accredited health professional, such as a midwife, doctor, or nurse, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth, and the immediate postnatal period and in the identification, management, and referral of complications in women and newborns.

In this study we used utilization of a skilled birth attendant during delivery as the main outcome variable.

In the KDHS women were asked who had attended their most recent delivery. Responses such as “doctor” and “nurse/midwife” were classified as skilled, while unskilled included “community health worker”, “traditional birth attendant”, “family member”, “friend”, or “neighbour”. This classification accords with the World Health Organization (WHO) definition of a skilled health worker (WHO 2008). The 2008-09 KDHS survey also collected data on place of delivery, including private and public health facilities, home, or other places. Facility delivery and having an SBA present were found to be highly correlated (Appendix 2). Among the sample studied, 94 percent of women who were attended by an SBA delivered at a health facility. Still,

about 6 percent of the women were delivered by an SBA outside of the health facility. In such cases a husband's involvement might be particularly important to getting the services of an SBA. Therefore, utilization of an SBA is a more appropriate outcome variable than delivery in a facility, especially because skilled birth attendance also is an indicator of progress toward MDG 5.

**Male Involvement**

Two variables derived from the Men's Questionnaire were used to measure male involvement in maternal health care. The first variable was men's participation in any antenatal care that women received. This variable was based on the response to the question whether a man had accompanied his wife for at least one ANC visit during the most recent pregnancy resulting in a live birth. The variable was coded as "Yes" if the woman attended ANC and her spouse accompanied her; "No" if the woman attended ANC but her spouse did not accompany her; and "NA" (not applicable) if the woman did not attend ANC at all and therefore could not be accompanied by her spouse. The other variable was men's perception of woman's health. This variable was based on two questions—namely, (1) whether a spouse considered it crucial for a woman to be attended by a skilled birth attendant and (2) whether a spouse thought that childbearing is only a woman's responsibility. This variable was coded as positive if the spouse found SBA attendance crucial and also thought that childbearing was a joint concern. If the spouse held neither or only one of these two perceptions, the variable was coded as negative.

**Hypothesis and Research Questions**

We hypothesized that there was no association between male involvement and their partners' utilization of SBAs during delivery.

As noted, we sought to examine one main research question: whether, after controlling for other factors, male involvement in maternal health care influences women's utilization of skilled birth attendance. Additionally, this paper examines other factors potentially associated with utilization of an SBA.

**Household and Women's Characteristics**

The household characteristics included in the analysis were province, place of residence (urban or rural), and wealth index. The woman's characteristics were age, educational level, employment status (employed or unemployed), religion, number of children, number of ANC visits as well as timing of first ANC visit for the most recent birth, and whether the most recent pregnancy was planned.

The household wealth index is an indicator of the level of wealth constructed from data on household assets, services, and amenities. In our analysis we considered three categories: rich (which combined the richer and richest quartiles), middle, and poor (which combined the poorer and poorest quartiles).

**Data Analysis**

Data were analyzed using Stata 10 (StataCorp). Descriptive statistics are presented mainly as frequency listings and percentages because most of our variables are categorical.

We fitted an unadjusted logistic regression model to assess whether there were any associations between the outcome variable (utilization of a skilled birth attendant) and the socio-demographic characteristics of the woman, male perception, and male attendance at ANC. In our multivariate analysis we fitted an adjusted binary logistic regression model to assess the effect of male involvement in maternal health care on the utilization of a skilled birth attendant, while controlling for confounders—namely, province, place of residence, maternal characteristics (age, marital status, education, employment status, parity, number of ANC visits, timing of first ANC visit, and whether the most recent birth was planned).

In all our analyses we used the "svy" set command in Stata to adjust for the complex sampling scheme used in the DHS. We used the weights provided in the male dataset in the KDHS. All statistical testing was performed at a 95 percent level of significance.

## RESULTS

### Factors Associated with Utilization of Skilled Birth Attendants

Distribution of male involvement by utilization of an SBA is presented as bar charts in Figures 2 and 3. Descriptive statistics and univariate logistic regression results are shown in Table 1 for the two categories of variables, household characteristics and maternal characteristics, by the outcome variable, utilization of an SBA during the last delivery preceding the survey.

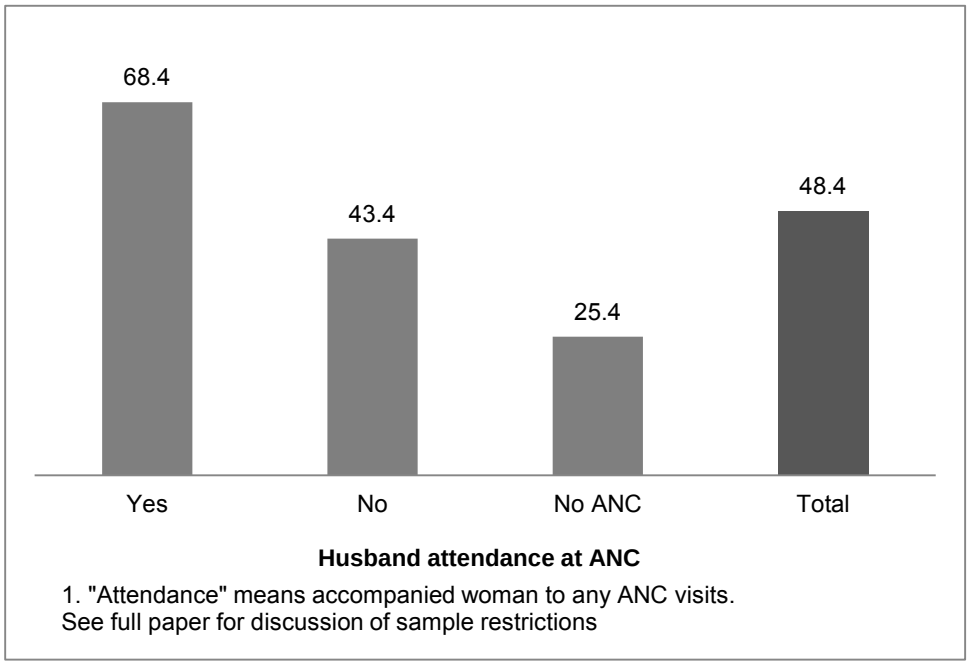
### Male Involvement

The majority (68 percent) of women whose husbands accompanied them for at least one ANC visit utilized a skilled birth attendant during delivery. The odds of utilizing a skilled birth attendant were 2.8 times higher for women who were accompanied by their husbands to at least one ANC visit than for women who had ANC but not accompanied by their husbands (OR 2.82, CI 1.49-5.36). As for the man's perception variable, about half (49.5 percent) of the women whose husbands had a positive perception were attended by a skilled birth attendant. Further, women whose husbands had a positive perception of the use of a skilled birth attendant had slightly higher odds of utilizing a skilled birth attendant than women whose husbands had a negative perception (OR 1.42, CI 0.89-2.27). This difference was not statistically significant, however.

### Distribution of Skilled Birth Attendance by Spouse's ANC Attendance

Figure 2 shows the percentage of women delivered by SBAs by spouse's attendance at ANC. A higher percentage of women whose spouses had accompanied them to an ANC visit were attended by SBAs.

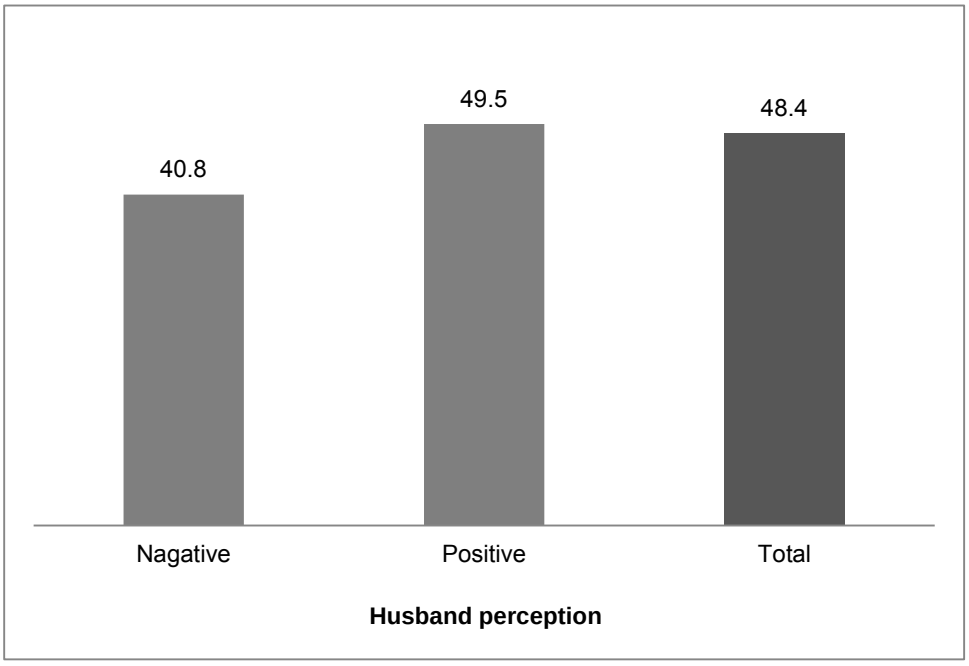
**Figure 2. Percentage of women attended by an SBA, by spouse's attendance at ANC, KDHS 2008-09**




## Distribution of Skilled Birth Attendance by Spouse's Perception

Figure 3 shows the percentage of women attended by SBAs by spouse's perception of maternal health. A higher percentage of women whose spouses had a positive perception of maternal health were attended by SBAs.

**Figure 3. Percentage of women attended by an SBA, by spouse's perception of women's health, KDHS 2008-09**




## Household and Couple's Characteristics

As shown in Table 1, the proportion of women who utilized SBAs was highest among those living in Nairobi (86.6 percent). The univariate logistic regression showed that province of residence was significantly associated with utilization of an SBA. Women in the Coast, Eastern, Nyanza, Rift Valley, North Eastern, and Western provinces were significantly less likely to utilize SBAs than women in Nairobi. The odds of utilizing an SBA were lowest among women in Western province—94 percent lower than for women living in Nairobi (OR 0.06, CI 0.02-0.16).

A higher proportion of women living in urban areas used SBAs than those living in rural areas—65.5 percent compared with 41.9 percent. Women in rural areas have 62 percent lower odds of utilizing a skilled birth attendant during delivery (OR 0.38, CI 0.18-0.81) than urban women.

Also, a higher proportion of those in the two richest wealth quintiles (68 percent) utilized SBAs than those in the two poorest wealth quintiles (28 percent). The odds of using an SBA

decrease consistently as one gets to the lower wealth quintiles. Women in the rich wealth quintiles have higher odds of using an SBA than those who are poor (OR 5.45, CI 2.85-10.42).

## Maternal Characteristics

Table 1 also shows the results for maternal characteristics. Unadjusted odds ratios indicate that education, employment status, number of ANC visits, timing of ANC visits, number of children, and whether the pregnancy was planned are strongly associated with whether a woman uses an SBA. We also observed a trend with age, although the association was not statistically significant.

**Table 1. Use of skilled birth attendants**

Distribution of women utilizing a skilled birth attendant by household and maternal characteristics and associated univariate odds ratios, KDHS 2008-09

| Variable | Number of couples | Percentage attended by SBA | Unadjusted OR (95 percent CI) |
|---|---|---|---|
| **Province** | | | |
| Nairobi | 59 | 86.6 | 1.000 |
| Central | 62 | 74.2 | 0.445 (0.144-1.373) |
| Coast | 60 | 54.1 | 0.182 (0.063-0.521) |
| Eastern | 80 | 52.8 | 0.173 (0.063-0.474) |
| Nyanza | 138 | 49.0 | 0.149 (0.057-0.386) |
| Rift Valley | 233 | 35.9 | 0.087 (0.034-0.223) |
| Western | 74 | 26.7 | 0.056 (0.019-0.163) |
| North Eastern | 25 | 42.3 | 0.113 (0.019-0.163) |
| **Type of place of residence** | | | |
| Urban | 200 | 65.5 | 1.000 |
| Rural | 531 | 41.9 | 0.381 (0.179-0.810) |
| **Wealth** | | | |
| Poor | 304 | 28.0 | 1.000 |
| Middle | 110 | 48.1 | 2.381 (1.355-4.182) |
| Rich | 317 | 68.0 | 5.453 (2.854-10.416) |
| **Educational level** | | | |
| None | 71 | 21.1 | 0.120 (0.043-0.331) |
| Primary | 454 | 43.3 | 0.340 (0.158-0.733) |
| Secondary or higher | 205 | 69.1 | 1.000 |

**Cont'd..**

**Table 1. Cont'd**

| Variable | Number of couples | Percentage attended by SBA | Unadjusted OR (95 percent CI) |
|---|---|---|---|
| **Employment status** | | | |
| None/don't know | 322 | 39.0 | 1.000 |
| Employed | 409 | 55.7 | 1.970 (1.138-3.410) |
| **Age group** | | | |
| 15-24 | 217 | 47.6 | 1.000 |
| 25-34 | 392 | 50.1 | 1.105 (0.690-1.770) |
| 35+ | 121 | 44.0 | 0.864 (0.507-1.473) |
| **Religion** | | | |
| Catholic | 161 | 45.6 | 1.000 |
| Protestant | 489 | 49.8 | 1.181 (0.689-2.025) |
| Other | 81 | 45.2 | 0.983 (0.458-2.111) |
| **Timing of first ANC visit** | | | |
| 1st trimester | 91 | 57.8 | 1.000 |
| 2nd trimester | 454 | 54.1 | 0.861 (0.469-1.580) |
| 3rd trimester | 137 | 36.2 | 0.414 (0.210-0.818) |
| Don't know/missing | 47 | 10.4 | 0.085 (0.022-0.333) |
| **Number of ANC visits** | | | |
| None/ don't know/missing | 66 | 13.8 | 0.094 (0.032-0.274) |
| 1 to 3 | 324 | 40.1 | 0.394 (0.255-0.609) |
| 4+ | 340 | 62.9 | 1.000 |
| **Parity** | | | |
| 1 | 121 | 66.1 | 1.000 |
| >1 | 609 | 44.8 | 0.417 (0.189-0.920) |
| **Planned pregnancy** | | | |
| Planned | 429 | 55.0 | 1.000 |
| Unplanned or mistimed | 301 | 38.9 | 0.522 (0.338-0.806) |
| **Total** | **730** | **48.4** | |

CI=confidence interval

**Determinants of Utilization of Skilled Birth Attendance (Adjusted)**

*Male Involvement*

After adjustment for other factors (Table 2), the odds of utilizing a skilled birth attendant were two times higher for women whose husbands attended at least one ANC visit than for those whose husbands did not attend ANC (AOR 2.17, CI 1.14-4.11). We further checked for interaction but found that the interaction term between spouse involvement and number of ANC visits by the mother was not significant.

Women whose husbands had a positive perception had lower odds, after adjustment, of utilizing a skilled birth attendant than those whose husbands had a negative perception (AOR 0.735, CI 0.387-1.394). This difference was not statistically significant, however.

*Other Determinants*

The other factors that were found to be statistically significant were province, woman's educational level, woman's employment status, religion, number of ANC visits, and number of children, as shown in Table 2.

We dropped the wealth index variable in this model, as it was highly correlated with residence. Timing of ANC visits was also dropped since it was highly correlated with number of ANC visits. Holding all other factors constant, women who were educated had higher odds of utilizing an SBA than those not educated. Also, women who were employed had higher odds of utilizing an SBA than those not employed. We observe that, after adjusting for other factors, women who did not attend any ANC visit had lower odds of utilizing an SBA than those who attended. Also, women with fewer children had higher odds of utilizing an SBA than those with many children.

**Table 2. Determinants of utilization of skilled birth attendants (adjusted odds ratio)**

| Variables | Adjusted odds ratio | 95 percent confidence interval |
|---|---|---|
| **Male participation** | | |
| Spouse attended ANC | | |
| Yes | 2.169** | 1.144-4.114 |
| Not available | 0.563 | 0.224-1.414 |
| No | 1.000 | |
| Spouse's perception of maternal health | | |
| Positive | 0.735 | 0.387-1.394 |
| Negative | 1.000 | |
| **Household characteristics** | | |
| Province | | |
| Nairobi | 1.000 | |
| Central | 0.415 | 0.107-1.613 |
| Coast | 0.178*** | 0.058-0.547 |
| Eastern | 0.192** | 0.042-0.888 |
| Nyanza | 0.138*** | 0.033-0.574 |
| Rift Valley | 0.086*** | 0.021-0.344 |
| Western | 0.060*** | 0.015-0.235 |
| North Eastern | 0.367 | 0.080-1.680 |
| Residence | | |
| Urban | 1.000 | |
| Rural | 0.745 | 0.354-1.568 |
| **Maternal characteristics** | | |
| Age group | | |
| 15-24 | 1.000 | |
| 25-34 | 1.313 | 0.648-2.656 |
| 35+ | 1.289 | 0.567-2.930 |
| Educational level | | |
| None | 0.066*** | 0.022-0.203 |
| Primary | 0.411*** | 0.243-0.697 |
| Secondary or higher | 1.000 | |
| Employment status | | |
| Unemployed | 1.000 | |
| Employed | 2.028** | 1.121-3.670 |
| Religion | | |
| Catholic | 1.000 | |
| Protestant | 1.313 | 0.649-2.656 |
| Other religion | 3.496** | 1.239-9.861 |
| Number of ANC visits | | |
| None/don't know/missing | 0.044*** | 0.010-0.189 |
| 1-3 | 0.540** | 0.324-0.901 |
| 4+ | 1.000 | |
| Number of children | | |
| 1 | 1.000 | |
| >1 | 0.379** | 0.178-0.808 |
| Planned pregnancy | | |
| Planned | 1.000 | |
| Unplanned or mistimed | 0.625 | 0.352-1.109 |

* p <0.05, **p <0.01, *** p <0.001

## DISCUSSION

### Male Involvement

Maternal mortality has remained persistently high in Kenya over the last decade. These deaths have been attributed primarily to lack of professional attention during pregnancy and delivery. There has been increasing attention to men's role in the uptake of maternal health care. This study explored male involvement in maternal health care as a determinant, alongside other factors, of utilization of skilled birth attendants.

Our findings do not support the null hypothesis that there is no association between male involvement in maternal health care and utilization of SBAs during delivery. In fact, our study found that women whose husbands accompanied them to at least one ANC visit were almost twice as likely to deliver using an SBA as those who had ANC but without husband's presence. This could imply that men who accompanied their wives to ANC were educated about the importance of skilled birth attendance. Our finding reinforces other studies showing that women were more likely to have better outcomes when their husbands got directly involved in maternal health care by attending ANC visits and supported their wives during pregnancy (Kabakyenga et al. 2012; Story et al. 2012). Studies in South Asia have found that women whose husbands show concern in pregnancy are more likely to utilize reproductive health services (Greene et al. 1991; Mpembeni et al. 2007). Further, some studies have shown that, when men know the danger signs of pregnancy and delivery, they may act as life-saving agents, ensuring that their wives get appropriate attention in obstetric emergencies (Chowdhury et al. 2007; Rahman et al. 2011).

All over the world there is an increasing interest in mainstreaming male participation in reproductive health, since men usually are the key decision-makers in the home and often control household finances. In reducing maternal mortality, the value of direct male involvement in maternal health care cannot be underestimated. Referring to MDG 5, an article in *Frontlines*, a monthly publication of the United States Agency for International Development (USAID), noted, "Reducing maternal deaths by 75 percent throughout the world by 2015 will take the involvement of men in countries where it matters most" (USAID 2010).

Our study did not find a statistically significant association between a man's perception of (1) whether it is crucial for his wife to be attended to by a skilled birth attendant and (2)

whether he thought that childbearing is a couple's joint concern, on one hand, and, on the other, their wives' actual use of SBAs. This held true in both the unadjusted and the adjusted results. Although our study does not find it, other studies have found a significant relationship between male perceptions of skilled birth attendance and the utilization of SBAs (USAID 2010; Wanjira et al. 2011). One reason that we did not find a significant relationship could be small sample size.

**Other Determinants of SBA Utilization**

In the multivariate analysis we found that province, educational level, employment status, number of ANC visits, and the number of children a woman has are significantly associated with utilization of a skilled birth attendant during delivery. This finding is consistent with the findings of other research (Abera et al. 2011; Baral et al. 2010; Choudhury and Ahmed 2011; Falkingham 2003; Gabrysch and Campbell 2009; Letamo and Rakgoasi 2003; Maureen et al. 2008; Mekonnen and Mekonnen 2003; Nketiah-Amponsah and Sagoe-Moses 2009; Onah et al. 2006; Shah et al. 2010; The Safe Motherhood Demonstration Project, Kenya 2003; Thind and Banerjee 2004; Wabuge 2010; Wanjira et al. 2011). Other research in Kenya has also shown that these factors influence the utilization of skilled birth attendants (The Safe Motherhood Demonstration Project, Kenya 2003; Wanjira et al. 2011).

## CONCLUSIONS AND RECOMMENDATIONS

Our study has shown that direct male involvement, particularly attendance at antenatal care, is an important determinant of utilization of a skilled birth attendant during delivery.

There is a need for planners of maternal health programs to develop innovative approaches that promote male involvement in reproductive health at various levels. The government, nongovernmental organizations, and other stakeholders could focus on creating awareness through mass-media health education campaigns targeting men, emphasizing mainly men's role in ensuring and facilitating their wives' use of maternal health services.

Our findings also strongly indicate the policy need to mainstream male involvement in women's reproductive health. Such policies should address men's role and constraints and also include an educational component to sensitize men to the benefits of their involvement in pregnancy care and outcomes. For men such efforts could help demystify reproductive health as exclusively a women's concern. In the Kenyan context it would be important to develop policy that helps integrate men into existing maternal health services, especially through attendance at ANC visits.

## STUDY LIMITATIONS

Since DHS data are cross-sectional, there are issues of recall bias. Also, we have no information about why a spouse did not attend ANC with his wife; a spouse's absence from home may be the reason, and not that he was unwilling to attend or uninterested.

## REFERENCES


Abera, M., A.G. Mariam, and T. Belachew. 2011. Predictors of Safe Delivery Service Utilization in Arsi Zone, South-East Ethiopia. *Ethiopia Journal of Health Sciences* 21(3): 101-113.

Baral, Y.R., K. Lyons, J. Skinner, and E.R. van Teijlingen. 2010. Determinants of skilled Birth Attendants for Delivery in Nepal. *Kathmandu University Medical Journal* 8(3): 325-332.

Berjsjø, P. 2001 What Is the Evidence for the Role of Antenatal Care Strategies in the Reduction of Maternal Mortality and Morbidity? In *Safe Motherhood Strategies: A Review of the Evidence*, edited by V. De Brouwere and W. Van Lerberghe, page 35-54. Antwerp, Belgium: ITGPress.

Bhalerao, V.R., M.M. Galwankar, S.S. Kowli, R.R. Kumar, and R.M. Chaturvedi. 1984. Contribution of the Education of the Prospective Fathers to the Success of Maternal Health Care Programme. *Journal of Postgraduate Medicine* 30(1): 10.

Biratu, B.T., and D.P. Lindstrom. 2007. The Influence of Husbands' Approval on Woman's Use of Prenatal Care: Results from Yirgalem and Jimma Towns, South West Ethiopia. *Ethiopian Journal of Health and Development* (20)2: 85-92.

Central Bureau of Statistics (CBS) [Kenya], Ministry of Health (MOH) [Kenya], and ORC Macro. 2004. *Kenya Demographic and Health Survey 2003.* Calverton, MD, USA: CBS, MOH, and ORC Macro.

Choudhury, N. and S.M. Ahmed. 2011. Maternal Care Practices among the Ultra Poor Households in Rural Bangladesh: A Qualitative Exploratory Study. *BMC Pregnancy and Childbirth* 11(1): 15.

Chowdhury, R.I., M.A. Islam, J. Gulshan, and N. Chakraborty. 2007. Delivery Complications and Healthcare-Seeking Behavior: The Bangladesh Demographic and Health Survey, 1999-2000. *Health & Social Care in the Community* 15(3): 254-264.

Cohen, S.I., and M. Burger. 2000. *Partnering: A New Approach to Sexual and Reproductive Health.* Technical Paper No. 3. New York, NY, USA: United Nations Population Fund.

Danforth, E.J., M.E. Krunk, P.C. Rockers, G. Mbaruku, and S. Galea. 2009. Household Decision-Making about Delivery in Health Facilities: Evidence from Tanzania. *Journal of Health, Population and Nutrition* 27(5): 696.

Drennan, M. 1998. *New Perspectives on Men's Participation*. Population Reports, Series J, No. 46. Baltimore, MD, USA: Johns Hopkins University, School of Public Health, Population Information Program. Available at http://archive.k4health.org/sites/default/files/j46.pdf

Essendi, H., S. Mills, and J.C. Fotso. 2010. Barriers to Formal Obstetric Care Services Utilization. *Journal of Urban Health* 88(suppl. 2): 356-369.

Falkingham, J. 2003. Inequality and Changes in Women's Use of Maternal Health-Care Services in Tajikistan. *Studies in Family Planning* 34(1): 32-43.

Gabrysch, S., and O.M. Campbell. 2009. Still Too Far to Walk: Literature Review of the Determinants of Delivery Service Use. BMC Pregnancy and Childbirth 9(1): 34.

Greene, M.E., M. Mehta, J. Pulerwitz, D. Wulf, A. Bankole, and S. Singh. 1991. *Involving Men in Reproductive Health: Contributions to Development.* New York, NY, USA: United Nations Millennium Project.

Kabakyenga, J.K., P.O. Östergren, E. Turyakira, and K.O. Pettersson. 2012. Influence of Birth Preparedness, Decision-Making on Location of Birth and Assistance by Skilled Birth Attendants among Women in South-Western Uganda. *PloS ONE* 7(4): e35747.

Kenya National Bureau of Statistics (KNBS) [Kenya], and ICF International. 2010. *Kenya Demographic and Health Survey 2008-09.* Calverton, MD, USA: KNBS and ICF International.

Kulunya, L.I., J. Sundby, E. Chirwa, A. Malata, and A. Malura. 2012. Barriers to Husbands' Involvement in Maternal Health Care in A Rural Setting in Malawi: A Qualitative Study. *Journal of Research in Nursing and Midwifery* 1(1): 1-10.

Letamo, G., and S.D. Rakgoasi. 2003. Factors Associated with Non-Use of Maternal Health Services in Botswana. *Journal of Health, Population and Nutrition* 21(1): 40-47.

Maureen, M., P.M. Hansen, D.H. Peters, A.E. Lakhwinder, P. Singh, V. Dwivedi, A. Mashkoor, and G. Burnham. 2008. Determinants of Skilled Birth Attendant Utilization in

Afghanistan: A Cross-Sectional Study. *American Journal of Public Health* 98(10): 1849-1856.

McDonalgh, M. 1996. Is Antenatal Care Effective in Reducing Maternal Morbidity and Mortality? *Health Policy and Planning* 11(1): 1-15.

Mekonnen, Y., and A. Mekonnen. 2003. Factors Influencing the Use of Maternal Healthcare Services in Ethiopia. *Journal of Health, Population and Nutrition* 21(4): 374-382.

Mpembeni, R.N., J.Z. Killewo, M.T. Leshabari, N. Siriel, A.J. Massawe, D. Mushi, and H. Mwakipa. 2007. Use Pattern of Maternal Health Services and Determinants of Skilled Care during Delivery in Southern Tanzania: Implications for Achievement of MDG-5 Targets. *BMC Pregnancy and Childbirth* 7(1): 29.

Mullany, B.C., S. Becker, and M.J. Hindin. 2007. The Impact of Including Husbands in Antenatal Health Education Services on Maternal Health Practices in Urban Nepal: Results from a Randomized Controlled Trial. *Health Education Research* 22(2): 166-176.

National Coordinating Agency for Population & Development (NCPD) [Kenya]. 2010. *Maternal Deaths on the Rise in Kenya: A Call to Save Women's Lives.* Policy Brief No. 9. Nairobi, Kenya: NCPD.

Nketiah-Amponsah, E., and I. Sagoe-Moses. 2009. Expectant Mothers and the Demand for Institutional Delivery: Do Household Income and Access to Health Information Matter? Some Insights from Ghana. *European Journal of Social Sciences* 8(3): 469-482.

Onah, H.E., L.C. Ikeako, and G.C. Iloabachie. 2006. Factors Associated with the Use of Maternity Services in Enugu, Southeastern Nigeria. *Social Science and Medicine* 63(7): 1870-1878.

Rahman, M., S.E. Haque, and M. Zahan. 2011. Factors Affecting the Utilization of Postpartum Care among Young Mothers in Bangladesh. *Health & Social Care in the Community* 19(2): 138-147.

Rooney, C. 1992. Antenatal Care and Maternal Health: How Effective Is It? A Review of the Evidence. Geneva, Switzerland: WHO.

Shah, N., D.K. Rohra, H. Shams, and N.H. Khan. 2010. Home Deliveries: Reasons and Adverse Outcomes in Women Presenting to a Tertiary Care Hospital. *Journal of Pakistan Medical Association* 60(7): 555.

Story, W.T., S.A. Burgard, J.R. Lori, F. Taleb, N.A. Ali, and D.E. Hoque. 2012. Husbands' Involvement in Delivery Care Utilization in Rural Bangladesh: A Qualitative Study. *BMC Pregnancy and Childbirth* 12(1): 28.

Terefe, A., and C.P. Larson. 1993. Modern Contraception Use in Ethiopia: Does Involving Husbands Make a Difference? *American Journal of Public Health* 83(11): 1567-1571.

The Safe Motherhood Demonstration Project, Kenya. 2003. *Traditional Birth Attendants in Maternal Health Programmes.* Safe Motherhood Policy Alert No. 4. Nairobi, Kenya: Ministry of Health, University of Nairobi, and Population Council.

Thind, A., and K. Banerjee. 2004. Home Deliveries in Indonesia: Who Provides Assistance? *Journal of Community Health* 29(4): 285-303.

United Nations Population Fund (UNFPA). 2009. *Family Planning in Kenya: Not for Women Only.* New York, NY, USA: United Nations. Available at http://www.unfpa.org/ public/News/pid/3015

United Nations Statistics Division. 2006. *Progress towards the Millennium Development Goals, 1990-2005: Goal 5: Improve Maternal Health.* New York, NY, USA: United Nations. Available at http://unstats.un.org /unsd/mi/goals_2005/goal_5.pdf [accessed December 2012].

United States Agency for International Development. 2010. Men Key to Reducing Maternal Deaths in Developing Countries. FrontLines, May. Available at http://transition.usaid.gov /press /frontlines/fl_may10/p08_men100517.html.

Varkey, L.C., A. Mishra, A. Das, E. Ottolenghi, D. Huntington, S. Adamchak, M.E. Khan, and F. Homan. 2004. *Involving Men in Maternity Care in India*. New Delhi, India: Frontiers in Reproductive Health, Population Council.

Wabuge, E.M. 2010. *Obstetric Care in the Home Delivery among Women in Lugari District, Western Province, Kenya.* JKUAT Abstracts of PostGraduate Thesis. Available at http://elearning.jkuat.ac.ke/journals/ojs/index.php/pgthesis_abs/article/view/410/330.

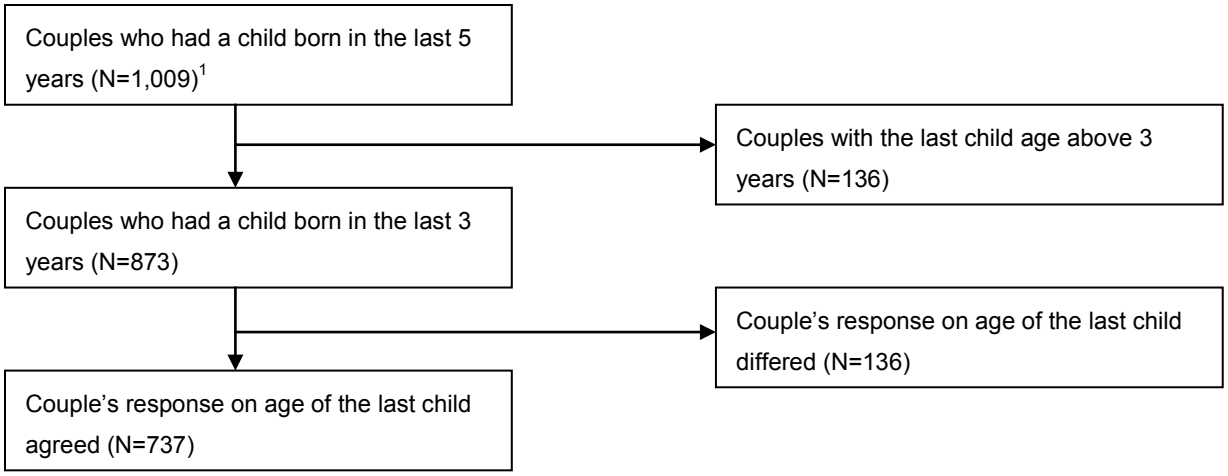
Wanjira, C., M. Mwangi, E. Mathenge, and G. Mbugua. 2011. Delivery Practices and Associated Factors among Mothers Seeking Child Welfare Services in Selected Health Facilities in Nyandarua South District, Kenya. *BMC Public Health* 11(1): 360.

World Health Organization (WHO). 2008. Proportion of Births Attended by a Skilled Health Worker, 2008 Updates. Geneva: WHO.

World Health Organization (WHO). 2012. Trends in Maternal Mortality: 1990 to 2010. Geneva Switzerland: WHO.

## APPENDICES

### Appendix 1. Sample selection flow diagram




[1] Restricted to 5 years since women asked about the births in the last 5 years and not 3 years which is the case for men in the KDHS.

### Appendix 2. Relationship between use of skilled birth attendant and place of delivery

| | Use of skilled birth attendant | | |
|---|---|---|---|
| **Place of delivery** | **No** | **Yes** | **Total** |
| Other | 354 | 24 | 378 |
| | 93.7% | 6.4% | 100.0% |
| | 99.4% | 6.3% | 51.3% |
| Health facility | 2 | 357 | 359 |
| | 0.6% | 99.4% | 100.0% |
| | 0.6% | 93.7% | 48.7% |
| Total | 356 | 381 | 737 |
| | 48.3% | 51.7% | 100.0% |
| | 100.0% | 100.0% | 100.0% |

Pearson $\chi^2(1)=639.0271$; $p<0.01$