

## Are some women more at risk of obstetric fistula in Uganda? Evidence from the Uganda Demographic and Health Survey

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### Abstract

With only four years left for the Millennium Development Goal's 2015 deadline for reducing poor maternal health outcomes, developing countries are still bearing a huge burden of maternal morbidity worldwide. Estimates show that over 2 million women worldwide are suffering from obstetric fistula, the majority of which live in sub-Saharan Africa, Southeast Asia, and the Arab region. The purpose of this study is to shed a light on obstetric fistula by examining risk factors associated with this morbidity in Uganda. Descriptive and multivariate analyses were conducted using data from the 2006 Uganda Demographic and Health Survey. Older age at first sexual intercourse was significantly associated with a lower risk of obstetric fistula (OR=0.302) compared to younger age at first intercourse (7-14 years). Lack of autonomy was negatively associated with the risk of obstetric fistula; women who have problems securing permission from their husband to go seek care (OR=1.658) were more likely to suffer from this morbidity. Significant differentials in obstetric fistula have also been observed based on the region of residence: women living in Central (OR=4.923), East Central (OR=3.603), West Nile (OR=2.049), and Southwest (1.846) more likely to suffer from obstetric fistula than women living in North Central. Findings demonstrate the importance of improving geographical accessibility to maternal health care services, and emphasize the need to reinforce intervention programs, which seek to address gender inequalities.

### Introduction

Maternal morbidity remains a conspicuous and stark public health issue in developing countries. Current best estimates indicate that for each woman who dies from pregnancy related complications, 15 to 30 women are seriously impaired and disabled from childbirth

related complications in less developed countries.<sup>1</sup> One example of this anomaly is this prevalence of obstetric fistula in developing countries. In sub-Saharan Africa alone, between 30,000 and 130,000 of women giving birth develop fistula each year.<sup>2</sup>

Obstetric fistula is caused by obstructed labour, one of the major causes of maternal mortality and morbidity in developing countries.<sup>3</sup> It is an extremely debilitating condition that occurs when a woman endures prolonged obstructed labour without receiving a timely Caesarean section. This may leave her if she survives with extensive damages to organs in her pelvis -a hole between the vagina and the bladder, or the vagina and the rectum- leading to chronic incontinence of urine and/or faeces. Obstetric fistula has serious negative health consequences for both the mother and the baby. If left untreated, obstetric fistula can lead to many health complications such as skin infections, neurological disorders and orthopaedic injury, kidney failure or infertility.<sup>2,4</sup> Obstetric fistula is also related to a high number of stillbirths and deaths within the first week of life.<sup>5</sup> Furthermore, most of women suffering from obstetric fistula experience severe social isolation due to the persistent odour resulting from their incontinence.<sup>6</sup>

Yet, despite the severity of this health condition, obstetric fistula has only recently started to gain an increased attention in public health from international organizations, governments and non-profit organizations, notably with the global Campaign to end fistula initiated by the UNFPA in 2003. Intensifying efforts to end obstetric fistula have also been acknowledged as part of support to the achievement of the Millennium Development Goal 5 of reducing maternal mortality by two thirds by 2015.<sup>7</sup> Alternatively, most of the published research on fistula in developing countries comes from clinical based studies<sup>8,9</sup> therefore limiting scope and broader generalizability. Owing to the paucity of existing population-based research,<sup>10,11</sup> the objective of this study is to examine factors that contribute to the risk of developing obstetric fistula using the 2006 Uganda Demographic and Health Survey.

### Materials and Methods

#### Setting

Uganda is situated in the Eastern part of Africa, bordered by Sudan to the north, Kenya to the east, Tanzania and Rwanda to the south and Democratic Republic of Congo to the west. In 2009, the population was estimated at 30.7 million, with a rapid growth of 3.2% per year and a low life expectancy of 50.4 years.<sup>12</sup> Uganda is one of the poorest countries in the

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world, where about 75 percent of the population lives below the international poverty line of US \$2.00 per day.<sup>13</sup> Recent estimates show an high estimated maternal mortality ratio of 550 deaths per 100,000 live births and a soaring child mortality rate of 135 deaths per 1000 live births.<sup>14</sup> These poor reproductive health outcomes are compounded with a high total fertility rate of 6.3 children per women and a high unmet need for family planning of 40.6%, that is the percentage of women who want to delay having a child or to stop having children but are not using any contraception.<sup>14</sup>

#### Data

This study used data from the 2006 Uganda Demographic and Health Survey (UDHS), which is the first of its kind to collect information on obstetric fistula in Uganda, providing information to investigate this morbidity at a population level in this country.<sup>15</sup> The particulars of the sample design and survey implementation can be obtained from the Uganda DHS report.<sup>15</sup> This research focused on responses from the women's questionnaire. Given that women exposed to the risk of pregnancy are the focus of this analysis, the survey sample of 8531 was restricted to 7243 women who have engaged in sexual intercourse.

#### Measurement

The dependent variable in this analysis is obstetric fistula, an abnormal connection between the urinary tract and the vagina or the rectum and the vagina resulting in the continuous involuntary discharge of urine or faeces into the vaginal vault.<sup>16</sup> In the 2006 UDHS, all women were asked the following question: *Sometimes a woman can have a problem, usually after a difficult childbirth, in which she*

experiences uncontrollable leakage of urine or stool from her vagina. Have you ever experienced this problem? The outcome variable assumes a value 1 if the woman responds yes to this question, indicating she has obstetric fistula and a value 0 otherwise.

Independent variables are grouped into socioeconomic and cultural variables based on the evidence from the literature. Socioeconomic variables include current age, marital status, education level, household wealth index, place of residence and region of residence. Cultural factors consist of age at first sexual intercourse used in this study as a proxy for age at first pregnancy, age at first birth, having a say on own health care and getting permission to seek care.

### Statistical analyses

Both bivariate and multivariate analyses are conducted in SAS 9.2. Due to the complex design of the survey, the SURVEYFREQ and SURVEYLOGISTIC procedures are used to generate Chi-square statistics and to estimate a logistic regression model respectively. Age at first birth is omitted from the regression model due to its high correlation with age at first intercourse.

## Results

### Characteristics of the women in the 2006 UDHS sample

Table 1 presents the distribution of all variables included in this analysis based on place of residence. Statistically significant differences are found based on place of residence for all variables except age at first birth. The proportion of women with obstetric fistula differs marginally based on place of residence. Obstetric fistula cases are higher among women living in rural areas (3.40%) than among those living in the urban areas (1.95%).

Age distributions of women differ significantly based on rural or urban residence. In urban areas, the percentages of women aged 15-19 (12.84%), 20-24 (27.36%), and 25-29 (21.88%) appear to be higher than that of women in rural settings with 11.17%, 20.60% and 18.72% respectively. Marital status variable varies significantly based on place of residence, with women in rural areas more likely to be married (76.31%) than their counterparts in urban areas (58.04%). Educational levels differ significantly based on place of residence. In rural areas, the percentage of women with no education (24.78%) is three times higher than that in urban areas (8.85%). While most rural women have a primary education (61.93%), women in urban areas tend to be highly educated with 49.24% who reported a

secondary or higher education level compared to only 13.29% in rural areas. Additionally, the distribution of wealth measured by a wealth index variable varies significantly based on place of residence. In general, rural women appear to be more economically disadvantaged compared to their urban counterparts. In fact, 76% of women in urban areas live in households that fall in the richest quintile reflecting the highest economic status, in comparison to

13.12% of women in rural areas.

Age at first intercourse differs significantly based on place of residence. Most women have their first sexual intercourse between the ages of 15 and 19. However, quite a large percentage of women in rural areas (25.74%) and in urban areas (21.48%) have their first intercourse at a very early age, between the ages of 7 and 14. Decision-making power in the household varies significantly based on place of resi-

**Table 1. Weighted percentages of obstetric fistula cases among women age 15-49 by place of residence with design effects (n=7243).**

Variables (n=1199)	Urban residential location (n=6044)	Rural residential location
Obstetric fistula	1.95	3.40
<i>Socioeconomic characteristics</i>		
Current age***		
15-19	12.84	11.17
20-24	27.36	20.60
25-29	21.88	18.72
30-34	14.97	17.02
35-39	10.60	13.34
40-44	7.65	10.57
45-49	4.71	8.59
Current marital status***		
Never married	21.47	8.55
Married	58.04	76.31
Divorced	4.45	5.09
Widow	16.05	10.05
Education***		
None	8.85	24.78
Primary	41.91	61.93
Secondary or higher	49.24	13.29
Wealth index***		
Poorest	2.47	22.29
Second	4.04	22.92
Middle	4.49	21.73
Fourth	12.94	19.94
Richest	76.07	13.12
Region		
Central	4.59	11.77
North Central	5.98	9.78
Kampala	48.17	
East Central	6.00	10.66
Eastern	5.50	15.77
North	10.06	17.22
West Nile	5.04	5.30
Western	7.10	16.68
Southwest	7.58	12.81
<i>Cultural factors</i>		
Age at first intercourse***		
7-14 years	21.48	25.74
15-19 years	66.52	67.97
20-24 years	10.55	5.88
≥ 25 years	1.45	0.41
Age at first birth		
10-14 years	6.86	7.14
15-19 years	66.38	69.26
20-24 years	22.44	20.43
≥ 25 years	4.32	3.18
Household decision making*		
Woman involved	70.48	63.16
Woman not involved	29.52	36.84
Getting permission to seek care		
Big problem	5.23	8.20
Not a big problem	94.77	91.80

\*\*\*P<0.001; \*\*P<0.01; \*P<0.05.

dence. About 70% of women in urban areas report having a say on different decision in their household compared to 63.16% in rural areas. Getting permission to seek differs marginally based on place of residence. More women in rural areas reported having issue securing permission to seek care (8.20%) compared to their counterparts in urban areas (5.23%).

### Multivariate analysis

Table 2 presents the odds ratios and related confidence intervals of the selected covariates in the logistic regression model. The findings show a positive relationship between women's current age and obstetric fistula, and almost all coefficients appear to be marginally significant. Women aged 20-24 were 2.45 times more likely to have obstetric fistula compared to women aged 15-19. Similarly, women aged 25-29 (OR=2.804), 30-34 (OR=3.649) and 45-49 (OR=3.068) were more likely to report obstetric fistula than women ages 15-19. This unexpected relationship could be explained by the fact that current age reflects the duration of exposure to this health condition rather than the age of occurrence. Findings also reveal significant differences in the relationship between region of residence and the risk of obstetric fistula. Women living in Central (OR=4.924), East Central (OR=3.603), West Nile (OR=2.049) and Southwest (OR=1.846) were significantly more likely to suffer from fistula compared with women living in North Central region.

Furthermore, results indicate that the younger the age, the higher the risk of obstetric fistula, with women aged 20-24 having 70 percent lower odds of suffering from fistula than women aged 7-19. Finally, women who report having some issues getting permission to seek care were 1.88 times more likely to develop fistula compared to women who report not having issues getting permission to go seek care.

### Discussion

The main objective of this study was to examine factors that significantly contribute to the risk of obstetric fistula in Uganda, one of the countries most affected by this health condition in sub-Saharan Africa.<sup>2</sup> Professional attendance during childbirth and access to emergency obstetric care are critical interventions that substantially avert maternal mortality and morbidity. However, despite considerable efforts by the Ugandan government and non-governmental organizations to increase health facilities, improve quality of services, and increase access to care, inequalities in maternal healthcare are still striking as many

women continue to deliver at home and/or without a skilled birth attendant. Recent statistics indicate that 58% of women gave birth at home and only 42% of births are attended by a trained medical professional.<sup>15</sup> Low levels of utilization of maternal health services make women more prone to obstetric fistula.

Findings from the bivariate analysis show that statistically significant variations exist across all variables based on place of residence, except for age at first birth. These variations underline the fact that associations between obstetric fistula and women's socioeconomic and cultural characteristics do vary across the two subgroups. Results of the multivariate analysis reveal that region of residence, age at first intercourse and woman's autonomy are associated with the risk of obstetric fistula. Regional variations in the incidence of obstetric fistula represent an interesting finding in this study. This may reflect the distribution of health infrastruc-

tures and health provisions as well as the level of socioeconomic development across Uganda. Similar to previous studies in developing countries,<sup>10,17-20</sup> we found that young age at first sexual encounter, a proxy for age at first pregnancy, increases the risk of obstetric fistula. The incomplete development of the pelvic of a young girl may explain the higher risk of suffering from obstetric fistula. Consistent with existing literature,<sup>21</sup> our findings indicate that lack of autonomy is negatively associated with the risk of obstetric fistula. In most patriarchal societies like in sub-Saharan Africa, women do not usually take part in making decisions in the household even when it comes to their own health needs. Most women are dependent to their husband or even their in-laws to get permission to go seek care and also to get money to cover medical fees which could impact the time frame to seek care and ultimately make them more prone to sustain obstetric fistula.

Alternatively, no statistically differences

**Table 2. Results of the logistic regression model of obstetric fistula adjusted for complex survey design, 2006 UDHS (n=7243).**

Independent variables	Odds ratio	95% Confidence interval
<i>Socioeconomic characteristics</i>		
Current age (Ref=15-19)		
20-24	2.449*	(1.038 5.779)
25-29	2.804*	(1.171 6.710)
30-34	3.649*	(1.519 8.765)
35-39	2.481*	(0.977 6.302)
40-44	2.281	(0.824 6.313)
45-49	3.068**	(1.229 7.663)
Current marital status (Ref=Married)		
Never married	0.819	(0.321 2.093)
Divorced	1.321	(0.811 2.152)
Widow	0.650	(0.299 1.412)
Education (Ref=No education)		
Primary	1.050	(0.703 1.567)
Secondary or higher	0.923	(0.471 1.808)
Wealth Index (Ref=poorest)		
Second	1.182	(0.760 1.838)
Middle	0.920	(0.499 1.696)
Fourth	1.019	(0.515 2.018)
Richest	0.802	(0.380 1.694)
Place of residence (Ref=Rural)		
Urban	1.065	(0.472 2.400)
Region (Ref=North Central)		
Central	4.923***	(0.356 1.427)
Kampala	1.542	(0.079 0.630)
East Central	3.603**	(0.300 0.908)
Eastern	2.075	(0.300 0.908)
North	4.246	(0.290 1.304)
West Nile	2.049**	(0.131 0.670)
Southwest	1.846***	(0.136 0.524)
<i>Cultural characteristics</i>		
Age at first intercourse (Ref= 7-14)		
15-19	0.862	(0.637 1.167)
20-24	0.302*	(0.111 0.826)
≥ 25	0.515	(0.069 3.853)
Getting permission to seek care (Ref=Not a big problem)		
Big problem	1.658*	(1.045 2.629)

\*\*\*P<0.001; \*\*P<0.01; \*P<0.05.

were found between socioeconomic status (SES) variables namely place of residence, education, wealth index and obstetric fistula. These results are not consistent with findings of previous research conducted elsewhere in Africa,<sup>22-25</sup> particularly in Malawi where Johnson<sup>10</sup> found sound evidence of association between obstetric fistula and SES variables. This could be explained by the fact that obstetric fistula is a rare event in the sample and therefore significant associations between the outcome and different covariates may be difficult to find.

The findings of our study have implication in practice. Actions to reduce and eliminate obstetric fistula should be based on a holistic framework that incorporates women right of better reproductive health, women's status, equal access to health care services among the regions. Knowledge of regional variations in obstetric fistula is important for policy purposes. With such knowledge, the design and location of development projects, which directly and indirectly have an impact on obstetric fistula, as well as health service facilities, which affect outcome of obstetric fistula, can be chosen and adjusted appropriately to suit policy objectives.

Furthermore, despite the fact that 2006 UDHS provides an opportunity to study obstetric fistula at a population level, it is possible that the survey underreports obstetric fistula, given the fact that women who sustained this morbidity usually do not remain in their household because their husband, family and community have rejected them. Appropriate data are still needed for the analysis of this morbidity, which would be highly relevant and useful for both analytical and policy purposes.

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