A multilevel analysis of the predictors of access to Caesarean Section services among women who deliver from institutionalized facilities in Uganda.

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Introduction

The prevalence of caesarean sections (CS) in the sub-Saharan Africa has increased over the years. The recommended CS population prevalence rate for medical indications should be at least within the range of 5 – 15%. Whether, the rise in the trend for the prevalence of caesarean sections is associated with non-medical indications, this has not been adequately documented in the sub Saharan Africa region. In Uganda, the population prevalence doubled from 3% in 2001 to 6% in 2016, while in health facilities, caesarean section rates rose from 9% in 2012 to 11% in 2016. Despite the improvement in accessing CS services as a component of Emergency Neonatal and Obstetric Care (EMNOC), maternal and neonatal mortality reduction has continued to lag behind in Uganda. Maternal mortality remains high at 336 deaths per 100,000 live births, while neonatal mortality only reduced from 33 – 27 deaths per 1000 live births in the period 2000/1 and 2016. Therefore, this study examines the factors that are associated with uptake of caesarean section services to inform on what and where policy interventions and programs need to emphasize so as to achieve targets on Sustainable Development Goals for maternal and child mortality by 2030.

Methodology

Data from the Uganda Demographic Health Survey (2016) was analyzed. The survey used a two stage sampling design to collect nationally representative cross-sectional data. A multilevel mixed effects logistic regression was used for the multivariate analysis, with the recent birth delivered by caesarean section as the dependent variable. The variable identifying the group structure for the random effects was the place of delivery, with government hospital, government health facility and private health facility as the categories. Two-level random intercept models were analyzed: model 1 (without individual woman characteristics) and model 2 (with individual woman characteristics). Only women who had recent institutionalized place of delivery were included in the study. Significance was at 95% level of confidence.

Results

A weighted sample size of 7786 was analyzed. The odds of having a CS were 1.7 times higher among women with a richest wealth status (p = 0.009 CI 1.13 – 2.44), 1.8 times higher among women from the Bunyoro and Tooro sub region (p = 0.004 CI 1.20 – 2.61), 1.4 times higher among women who had five and more Antenatal care (ANC) health facility visits (p = 0.002 CI 1.14 – 1.78), 1.7 times higher among women with a health insurance cover (p = 0.030 CI 1.05 – 2.76), keeping other factors constant. The odds of having a CS were 0.6 times lower among women from Busoga, Bugishu and Bukedi sub regions (p = 0.025 CI 0.42 – 0.94), 0.65 times lower among women who had two or higher parity (p<0.000 CI 0.52 – 0.82). The odds of having a CS were 1.5 times higher among women whose husbands or partners had higher level of education, but had no statistical importance (p = 0.083 CI 0.95 – 2.39). The estimated random effect variance was 2.26 with 2.27 standard error. The log rank test indicated a significant variation in women characteristics accessing CS services from government hospitals, government health facilities and private health facilities as places of delivery (p<0.000).

Conclusion.

To fast track attainment of targets on SDG 3 for maternal and child mortality, priority should focus on the following: 1) Interventions that motivate women to attend 5+ ANC visits during pregnancy, especially those with 2+ parity; 2) Addressing regional or geographical differential barriers to accessing maternal and child health services; 3) Removing institutional structure, EMNOC functionality barriers and creation of a positive perception of the communities towards government

hospitals and health facilities. Future research should explore the dynamics of non-medical indications that may influence the population CS prevalence and incidence trends.

Table 1 Multilevel fixed random effects model regression results

Variables	Model 1: (odds ratio) CI	Model 2: (odds ratio) CI
Sex of the household head		
Male		1
Female		(0.996) 0.814 - 1.218
Wealth status		
Poorest		1
Poorer		(1.027) 0.715 - 1.475
Middle		(1.321) 0.925 - 1.888
Richer		(1.257) 0.873 - 1.811
Richest		(1.651**) 1.127 - 2.421
Age of the husband (Years)		
15 - 24		1
25 - 34		(0.881) 0.629 - 1.234
35 - 49		(0.973) 0.666 - 1.420
50+		(1.054) 0.622 - 1.788
Age of the woman (Years)		
15 - 24		1
25 - 34		(1.212) 0.958 - 1.532
35-49		(1.244) 0.858 - 1.804
Religion		
Catholic		1
Anglican		(0.934) 0.765 - 1.139
Muslim		(1.044) 0.817 - 1.335
Pentecostal and Others		(0.810) 0.629 - 1.044
Region		
Kampala		1
Buganda South		(1.347*) 0.957 - 1.897
Buganda North		(1.314) 0.890 - 1.941
Busoga, Bugishu, Bukedi		(0.632**) 0.421 - 0.948
Teso, Karamojong, Lango		(1.200) 0.784 - 1.838
Acholi and Westnile		(1.086) 0.709 - 1.663
Bunyoro and Tooro		(1.770***) 1.201 - 2.611
Ankole and Kigezi		(1.125) 0.749 - 1.691
Person who makes a decision on woman's health care		
Woman only		1
Couple's joint decision		(1.119) 0.896 - 1.397
Husband or others		(1.046) 0.806 - 1.358
Marital Status		
Never in union		1
Stays together with husband/partner		(1.428) 0.639 - 3.193
Does not stay with the husband/partner		(1.201) 0.819 - 1.762
Woman's education level		
No education		
Primary		(0.949) 0.657 - 1.372
Secondary		(0.822) 0.546 - 1.237
Tertiary		(1.479) 0.925 - 2.364

Table 1 (continued)

Variables	Model 1: (odds ratio) CI	Model 2: (odds ratio) CI
Husband's occupation type		
Not working		1
Professional or managerial job		(0.722) 0.391 - 1.334
Agriculture		(0.918) 0.494 - 1.709
Service and manual labour		(0.796) 0.437 - 1.450
Woman's occupation type		
Not working		
Professional or managerial job		(1.119) 0.867 - 1.444
Agriculture		(0.989) 0.753 - 1.299
Service and manual labour		(0.869) 0.670 - 1.128
Access to health Insurance cover		
No		1
Yes		(1.685**) 1.040 - 2.729
Husband's education level		
No education		1
Primary		(0.979) 0.653 - 1.467
Secondary		(0.972) 0.638 - 1.480
Tertiary		(1.487*) 0.936 - 2.361
First antenatal visits for recent previous pregnancy		
First Trimester		1
Any time later after first trimester		(1.051) 0.874 - 1.263
Birth order for recent previous birth		
First order birth		1
2 -3 order birth		(0.652***) 0.519 - 0.818
4 - 5 order birth		(0.455***) 0.329 - 0.631
6+ order birth		(0.472***) 0.315 - 0.706
Total ANC visits accessed for recent previous pregnancy		
Less than 4 visits		1
4 visits		(1.081) 0.887 - 1.319
5 or more (5+) visits		(1.425***) 1.143 - 1.777
Distance to the health facility		
Big problem		1
Not a big problem		(1.003) 0.832 - 1.209
Variance (Std Err)	2.74 (2.751)	2.262 (2.280)
Constant	(0.251***) 0.225 - 0.279	(0.156***) 0.058 - 0.422
LogRank Test Chi2	485.76, p<0.000	318.59, p<0.000
Intraclass Correlation	0.454, CI 0.104 - 0.851	0.408, CI 0.087 - 0.832
WaldChi2	0.000, P<0.000	326.02, p<0.000
Observations	7,786	7,786
Number of groups (CS health facility type)	3	3

Note: *** p<0.01, ** p<0.05, * p<0.1; CI = Confidence Interval