Skilled Birth Attendance Among Women in Hard to Reach Island Fishing Communities on Lake Victoria; A Cross-Sectional Survey.

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Abstract

Background: Maternal deaths continue to be a major challenge for maternal health in Uganda. Maternal deaths are at 336 maternal deaths per 100,000 live births, especially in rural hard to reach communities. Skilled birth attendance is key to preventing most maternal deaths. Rural fishing communities on Lake Victoria, Uganda could among communities with poor maternal health outcomes. We evaluated the extent of, and factors associated with skilled births attendance by women in fishing communities along Lake Victoria, Uganda at the most recent childbirth.

Methods: A cross sectional survey among 486 consenting women aged 15-49 years, who were pregnant or had a birth or abortion in the past 6 months was conducted in 6 island fishing communities of Kalangala district, Uganda, during January-May 2018. Interviewer administered questionnaires were used to collect data on socio-demographics, antenatal care and skilled birth attendance during the most recent childbirth. Regression modeling was used to determine factors associated with women's skilled birth attendance among 450 women with a previous childbirth.

Results: Majority of women had a skilled delivery during the most recent birth [86.9%,(391/450)], with less than two in five skilled births being at the islands [34.0%, (133/391)]. Women who received any one of the seven assessed ANC components were twice as likely to have had a skilled childbirth as those who didn't receive any ANC components (AOR=2.1; 95% CI:1.1-4.0).

Joint participant and partner health decisions, reporting no prior pregnancy loss, fewer than two lifetime births and none fishing related partner occupation were also associated with a likelihood of having had a skilled birth during the most recent delivery.

Conclusion: Skilled births attendance is still low in these island fishing communities. Tailored interventions to expand provision of components of ANC may improve women's skilled birth attendance in these islands.

Trial Registration: PACTR201903906459874 (Retrospectively registered).

Background

Almost 1,000 women die daily throughout the world from complications of pregnancy and childbirth, with Sub Saharan Africa accounting for over two thirds of these deaths (1). The lifetime risk of death due to pregnancy and childbirth related complications among women of reproductive in Sub Saharan Africa is 1 in 37, several times higher than that of Europe(1).

Uganda has one of the highest numbers of maternal deaths in sub-Sharan Africa, with a maternal mortality ratio (MMR) of 336 maternal deaths per 100,000 live births, implying that about 14 women die daily from pregnancy-related causes (2).

Women die from complications following childbirth or termination of pregnancy like; severe bleeding, infections, unsafe abortions and complications of being pregnant like high blood pressure, that account for almost three quarters of maternal deaths (3, 4).

Majority of these deaths occur in resource limited hard to reach rural settings where access to quality adequate health care and other social services is still a challenge. Cultural practices, beliefs, low socio-economic status, long

distances to services, lack of information and lack of skilled birth attendance also contribute to these maternal deaths(5, 6).

Skilled birth attendance (SBA) is key in prevention of women's morbidity and mortality (7–9). SBA refers to the care provided to a woman and her baby during pregnancy, childbirth and after childbirth by a qualified and competent health care provider often a midwife, nurse or doctor who has been educated and trained to proficiency in the expertise needed to manage pregnancy, labor, the immediate postnatal period, identification, management and referral of complications among women and babies (10).

SBA still is inadequate in Uganda especially in rural hard to reach communities, where several factors are contributing to the low SBA by women and eventual high maternal deaths:

Social cultural beliefs influence SBA. Some women don't feel comfortable being attended to in the supine position as is done in almost all health facilities in Uganda, feeling that they are exposing too much of their bodies (11–14). Such women would not want to have SBA and would rather opt for unskilled home deliveries where they can adopt any birth position of their choice (12). In some cultures, it is an indication of being a conqueror to have an unskilled home delivery than seeking SBA (12, 13).

Community, friends, spouse and family support are at times associated with SBA, with the absence of such support from friends and family negatively impacting SBA. Community, friends and family support provides aides for other household roles, transportation to health facility, companionship during delivery and material supplies to facilitate SBA (11, 15–19). Having been married was associated with SBA in some settings (20).

Women's age may affect SBA, with older women being less likely to have skilled births (21). Older women often have more birth experience and may think that they don't need to have a SBA (21–23). Older age is associated with experience and having many social-cultural relationships who might advise against SBA (17, 23).

Women with higher parity are less likely to have SBA, due to many household responsibilities or complacency with unskilled births (11, 22, 23). Higher parity may also be associated with a lot of social, household and family responsibilities which could deter multiparous women from SBA.

Higher education in most settings was associated with increased SBA (15, 20, 21, 24). Women with higher education may easily comprehend SBA related awareness information and are less likely to take up negative socio-cultural practices that don't favor SBA. Higher education may also be associated with a better social-economic status with easier access to paying employment and better health services, which facilitate SBA (24, 25). Partner's or spouse's education also affects SBA, with women whose spouses were better educated having more SBA than their counterparts with less educated partners (19).

Health workers' attitudes towards women during SBA, including a lack of confidentiality, unprofessionalism, rudeness, and staff absences negatively impact on attendance (13).

User fees especially in rural hard to reach settings were associated with less SBA (13). To majority of women in these settings, money to pay the fees in not readily available and preference may be given to other pressing basic needs like food, clothing especially when the previous births were uncomplicated (13).

Accessibility of SBA services may be limited by transport costs to the health facility, long distance or longer travel times to the facility (13, 20). Women in rural settings were less likely to have SBA (15, 20, 26, 27). This might be due

to health worker shortages, lack of supplies and equipment, as many rural areas are hard to reach making such items not readily available.

Antenatal care (ANC) is key to having a skilled childbirth and early prevention of complications during delivery that may cause maternal mortality, including pre-eclampsia, eclampsia and intrapartum hemorrhage due to anemia (15, 20, 21, 28, 29). ANC prepares women for a skilled birth through counseling and identifying those with complications that may require caesarian delivery (22).

Fishing communities (FCs) on Lake Victoria are among the hard to reach resource limited settings in Uganda, with limited access to SBA and other social services.

A fishing community is defined as a social and economic group of people living together in an area, who make most of their livelihood directly or indirectly from fishing activities. Members of the community consist of fishermen who go out to fish on boats, boat owners, those engaged in fish processing, boat makers, local fishing gear makers or repairers, those dealing in fishing equipment, managers of fishing boats and local businesses, including restaurants, bars, brothels, as well as fish mongers or traders (30).

There is a scarcity of information on SBA in FCs, though presumed to be low due presence of factors that have been associated with low SBA in other settings:

Previous studies indicate that majority of fisher folk spend less than five years in these fishing communities (31, 32). Duration of stay in FCs has been linked to retention in research and care, with members who stay less than a year being less likely to be retained (31, 32). The short duration of stay may be attributed to mobility as a significant proportion of the FCs population moves as fishing seasons vary (33). This mobility affects planning and access to SBA and other services. Women in need of SBA may move to locations where they cannot access such care (33), they eventually opt for unskilled births, which negatively impacts SBA in these FCs.

Women in FCs have been previously found to have some of the factors associated with low SBA utilization like low levels of education (31, 32). More than a third of people living in FCs on Lake Victoria Uganda are less educated, having primary or no formal education (34). Lower levels of education have been associated with limited access to health services and low SBA (6, 17, 20, 24, 35–40).

The remoteness of these FCs may be a deterrent for skilled health providers, with such communities being infiltrated by unskilled health workers, an antecedent for low SBA in these communities. It is also logistically challenging and more expensive to equip rural health facilities with the much-needed skilled births supplies in these communities.

FCs being rural hard to reach resource limited settings, with members being highly mobile, reproductive age women in these communities may be having challenges accessing SBA, with poor maternal health and mortality.

We explored the level of SBA and associated factors to better understand SBA and targeted skilled birth interventions among women from 6 hard to reach islands fishing communities in Kalangala district, Uganda.

Methods

Study design and setting

This study is part of an intervention study aimed at improving maternal health through capacity strengthening of community health workers (Village Health Teams).

This cross-sectional analysis aimed at understanding skilled birth attendance in 6 (Buwuvu, Jaana, Kitobo, Lulamba, Namisoke and Sserinya) purposively selected hard to reach Kalangala district, Uganda islands. The islands were selected from 12 islands where the authors had previous research experience based on remoteness (inaccessibility), with the nearest being two hours by motorized boat ride from Entebbe mainland and having a population of at least 1,000 people (34). The survey was conducted during January-May 2018.

Inclusion and exclusion criteria

Women aged 15–49 years at survey time, pregnant or with a pregnancy outcome (live birth, still birth, miscarriage or abortion) in the past 6 months were included. Women younger than 15 or over 49 years old, those who have never been pregnant or had a pregnancy outcome over 6 months ago were excluded. See Fig. 1.

Following study community's sensitization meetings where members were informed about the study, including who may participate. Self-identified eligible women reported to the study team which provided more study information and requested them to participate. Village local council leaders and community health workers (CHWs) provided guidance on which households had eligible women, which would be approached by the study team and requested to participate. Potential participants received detailed information about the study in the language of their choice between English and Luganda. This would be conducted in the presence of a guardian if the woman was a minor and / or an impartial witness if she was illiterate in the language of the consent. Women who understood the study information and were willing to take part, signed the informed consent document, a copy of which was given to them.

Trained research assistants administered face to face interviews to women who had agreed to participate following documented informed consent. The face to face interviews were conducted within the women's homes or workplaces or any other chosen convenient location of their choice, where confidentiality of the interview responses would be maintained. The trained research assistants were not residents or health care providers in the study communities, which minimized social desirability bias. Interviews involved responding to a pretested semi structured questionnaire designed in Open Data Kit (ODK) software (41), on computer tablets.

Data collected included; socio-demographic characteristics (age, date of birth, tribe, highest education, partner's highest education, religious affiliation, main occupation, partner's main occupation and marital status), factors related to pregnancy and child birth, household head names, study community, duration of community stay, whether they were staying with their partners, if the partner had other spouses, who makes health decisions for the participant, age at first pregnancy, total pregnancies, history of miscarriage, date of last miscarriage, total child births and date of last child birth. The tool also had questions on current pregnancy; if the woman was currently pregnant, months of current pregnancy, current or previous willingness to have skilled antenatal care, ANC attendance, reasons for non-attendance, number of visits attended, cadre of health worker seen at ANC and facility where ANC was received for the current or most recent pregnancy.

Women were asked if they received the following components of ANC at least once; blood pressure measurement, provision of a blood sample, provision of a urine sample, tetanus vaccination, Intermittent Preventive Treatment with Sulphadoxine/pyrimethamine (IPTp) including number of times of IPTp, deworming treatment, iron and folate supplements. We did not ask women about receipt of any form of counseling. The questionnaire also had questions on the most recent birth; time since last childbirth, place of childbirth, cadre (type) of person who assisted the childbirth, whom would they have preferred to assist them, place of birth and how long ago was their last HIV test.

Statistical Methods

This analysis aimed at answering the following questions;

1. What is the level of skilled birth attendance during the most recent childbirth?
2. What factors are associated with having a skilled birth attendant during the most recent birth?

Study variables:

Primary outcome variable was binary skilled birth attendance (childbirth assisted by nurses, midwives or doctors) by women during the most recent childbirth or still birth or abortion. Childbirths were coded “0” for unskilled birth and “1” for skilled birth.

Frequency tabulation of women’s characteristics and tabulation of characteristics by skilled birth attendance was used to analyze the distribution of study related factors. Bivariable chi-square tests were used to assess the associations between independent variables and the outcome skilled birth attendance at 95% significance level.

Categorization of independent variables was based on their logical relationship with the outcome variable (skilled birth attendance) at bivariable analysis. Independent variables included in the bivariable analysis were; residence community with or without a public health facility, duration of community stay, women’s age, age at first pregnancy, current marital status, religious affiliation, women’s education, women’s occupation, partner occupation, health decisions maker, pregnancy months at the most recent first ANC visit, receipt of all components of ANC at least once, cadre of skilled birth attendant at recent delivery, location of child birth (island vs mainland) and history of pregnancy loss.

To understand factors associated with skilled birth attendance at multivariable analysis, logistic regression modelling was done. A priori selection of predictor variables to include in the multivariable model was based on previous literature and biological plausibility. We also included variables with statistical significance (P-value ≤ 0.2) at bivariable analysis. We selected participants’ age at enrolment, household head gender, religious affiliation, participants’ highest education attainment, partner’s highest education attainment, participants’ occupation, partner’s occupation, resident community with public health facility, location of birth, current marital status, health decisions maker, lifetime pregnancies, lifetime births, history of pregnancy loss, any ANC attendance, four or more ANC visits attendance, ANC times and receipt of any component of ANC as variables for the multivariable model. We assessed for collinearity and removed variables that did not improve the model or were highly correlated with other variables in the model. The final best suited predictors in the model were those with the lowest P-values (up to $p = 0.05$), lowest model Akaike's information criterion (AIC) and Bayesian information criterion (BIC) values. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) were used to report associations. All analyses were done using STATA® version 15 (42). Tables were created using asdoc, a STATA program written by Shah (43).

Results

Participants socio-demographic characteristics

The survey involved 486 women from 6 island fishing communities, half [50.6%, (246/486)] of whom were pregnant at survey time and nearly half [49.4%, (240/486)] were not pregnant but had been during the past 6 months.

Women's age was between 15 to 45 years, majority were married [87.0%, (423/486)], their main occupation being housewife (stay-at- home mum) [45.1%, (219/486)], and never studied beyond seven years of formal education [69.1%, (336/486)]. Most women had spent between one to five years in these fishing communities [52.1%, (253/486)], staying in communities with a government (public) health facility [84.4%, (410/486)]. See Table 1.

Table 1
Characteristics of all study participants

Characteristics	Frequency	Percentage	p25	Median	p75
Age (years)			22	26	31
Age at first pregnancy (years)			16	17	19
Total births			1	3	4
ANC times			0	2	4
Age groups	(n = 486)				
15–24	193	39.7			
25–49	293	60.3			
Age at first pregnancy	(n = 486)				
15–19	402	82.7			
20–49	84	17.3			
Marital status	(n = 486)				
Married	423	87.0			
Not married	63	13.0			
Religion	(n = 486)				
Catholic	204	42.0			
Protestant	107	22.0			
Muslim	108	22.2			
Others	67	13.8			
Highest education	(n = 486)				
≥ 8	150	30.9			
1–7	304	62.5			
0	32	6.6			
Occupation group	(n = 486)				
Housewife	219	45.1			
Fishing related	35	7.2			
Others	232	47.7			
Partner occupation	(n = 423)				
Fishing related	299	70.7			
None fishing related	124	29.3			
Duration of stay	(n = 486)				

Characteristics	Frequency	Percentage	p25	Median	p75
3-11months	112	23.0			
1-5yrs	253	52.1			
> 5yrs	121	24.9			
Community public health facility	(n = 486)				
Absent	76	15.6			
Present	410	84.4			
Health decisions maker	(n = 486)				
Respondent	158	32.5			
Partner	98	20.2			
Respondent & partner	209	43.0			
Others	21	4.3			
Pregnancy loss history	(n = 486)				
Yes	200	41.2			
No	286	58.8			
First ANC visit timing	(n = 316)				
≤ 5 months pregnant	261	82.6			
> 5 months pregnant	55	17.4			

Skilled Births Attendance

Most women with a previous birth [86.9%,(391/450)] had a skilled attendant during their most recent childbirth, often a Nurse or Midwife [84.1%, (329/391)]. Majority of skilled deliveries were at the mainland [66.0%, (258/391)], with less than two of every five skilled births being at the islands [34.0%, (133/391)]. Unskilled births were mainly at the islands [88.1%, (52/59)], mostly by traditional birth attendants (TBAs) [50%, (26/52)]. TBAs were the most frequently sought unskilled birth attendants [45.8%, (27/59)], though nearly a third of women delivered on their own [30.5%,(18/59)]. See Table 2.

Table 2
Participants characteristics by skilled birth attendance

Characteristic	Total	Skilled (%)	Unskilled (%)	p-value
All women	450♦♦	391 (86.9)	59 (59.1)	
Age groups				0.06
25–49	287	243 (84.7)	44 (15.3)	
15–24	163	148 (90.8)	15 (9.2)	
Marital Status				< 0.05
Currently married	395	348 (88.1)	47 (11.9)	
Not married	55	43 (78.2)	12 (21.8)	
Highest education (Years)				0.65
≥ 8	133	118 (90.1)	15 (11.3)	
1–7	285	244 (85.6)	41 (14.4)	
0	32	29 (90.6)	3 (9.4)	
Partner occupation				< 0.05
Fishing related	281	240 (85.4)	41 (14.6)	
None Fishing related	114	108 (94.7)	6 (5.3)	
Community public health facility				< 0.05
Absent	71	56 (78.9)	15 (21.1)	
Present	379	335 (88.4)	44 (11.6)	
Health decisions maker				< 0.05
Participant	146	116 (79.5)	30 (20.5)	
Partner	93	83 (89.3)	10 (10.7)	
Participant & partner	196	178 (90.8)	18 (9.2)	
Others	15	14 (93.3)	1 (6.7)	
First ANC visit timing				<0.05
≤ 5 months pregnant	246	228 (92.7)	18 (7.3)	
> 5 months pregnant	51	40 (78.4)	11 (21.6)	
Receipt of any ANC component				< 0.05
Yes	296	267 (90.2)	29 (9.8)	
No	154	124 (80.5)	30 (19.5)	
Location of childbirth				< 0.05

Characteristic	Total	Skilled (%)	Unskilled (%)	p-value
Island	185	133 (34.0)	52 (88.1)	
Mainland	265	258 (66.0)	7 (11.9)	
Cadre of birth attendant				< 0.05
Doctor	61	61 (15.6)	0	
Nurse/Midwife	329	329 (84.1)	0	
Auxiliary Midwife	1	1 (0.3)	0	
Traditional birth attendant (TBA)	27	0	27 (45.8)	
Relative/Friend	12	0	12 (20.3)	
Other	2	0	2 (3.4)	
None	18	0	18 (30.5)	
Pregnancy loss history				< 0.05
Yes	198	163 (82.3)	35 (17.3)	
No	252	228 (90.5)	24 (9.5)	
♦♦31 women had no previous birth, 5 women missing birth data				

Women who were aged less than 24 years had more skilled births than their older counter parts (90.8% vs 84.7%). Women who were living in communities with a public health facility had more skilled births than those in communities without a public health facility (88.4% vs 78.9%). Nearly all women who had their first ANC visit within 5 months of being pregnant had a skilled birth compared to those who started ANC late after 5 months (92.7% vs 78.4%). See Table 2.

A relatively higher proportion of women who had SBA from the mainland had eight or more years of formal education compared to those who delivered from the islands (33.6% vs 23.8%).

Factors Associated With Skilled Birth Attendance

Women who received at least one of the ANC components (blood pressure measurement, provision of a blood sample, provision of a urine sample, tetanus vaccination, IPTp, deworming treatment, iron and folate supplements) that were assessed, were twice as likely to have had a skilled birth as those who did not receive any one ANC component (AOR = 2.1, 95% CI:1.1-4.0).

Participants whose partners were working in none fishing related occupations were thrice as likely as those whose partners were working in fishing related activities to have had a skilled birth during the most recent birth (AOR = 2.9, 95 CI: 1.2–7.1). Joint participant and their partner health care decisions was associated with having had a skilled birth (AOR = 1.9, 95 CI: 1.0-3.6). Women who had less than two previous child births and no previous pregnancy loss were 2.5 times as likely as those with two or more births and those who reported a previous pregnancy loss to have had a skilled birth (AOR = 2.5, 95 CI: 1.0-6.2 and AOR = 2.5, 95 CI: 1.3–4.8, respectively). See Table 3.

Table 3
Factors associated with skilled birth attendance

Skilled birth attendance	COR	95% CI	AOR	95% CI
Any ANC component receipt				
No	(Ref)		(Ref)	
Yes	2.2	1.3–3.9	**2.1**	**1.1- 4.0**
Community public health facility				
Absent	(Ref)		(Ref)	
Present	2.0	1.1–3.9	2.0	0.9–4.5
Partner Occupation				
Fishing related	(Ref)		(Ref)	
None fishing related	3.1	1.3–7.5	**2.9**	**1.2–7.1**
Health decisions maker				
Others	(Ref)		(Ref)	
Respondent & Partner	1.9	1.1–3.4	1.9	1.0-3.6
Lifetime child births				
≥ 2	(Ref)		(Ref)	
< 2	2.2	1.0-4.6	**2.5**	**1.0-6.2**
Ever lost pregnancy				
Yes	(Ref)		(Ref)	
No	2.0	1.2–3.6	**2.5**	**1.3–4.8**

Discussion

Skilled birth attendance is central to improvement of maternal health outcomes and reduction of maternal mortality. SBA from the islands was low [34%, (133/391)], despite majority of participants having had a skilled birth. Islands had the most unskilled child births, mostly by TBAs with nearly a third of women delivering on their own. Women who had a SBA from the islands were quite fewer than the national 2016 Uganda demographic and health survey (UDHS) islands average of 70% (2), though similar to other rural communities (15). The lower proportion of SBA in the islands could be due to fewer skilled birth attendants in these FCs and could be the reason for most of the SBA occurring on the mainland. The study district had only 16.4 skilled birth attendants per 10,000 people relative to the WHO sustainable development goals target of 44.5 per 10,000 people (44–46), which might have forced majority of pregnant women from these islands to go for SBA on the mainland. The inadequacy of skilled attendants could also have involuntarily encouraged women to seek birth assistance from unskilled attendants especially TBAs as has been noted in other rural parts of Uganda (14), though all women reported that they would have preferred a SBA. Poor geographic accessibility across one island to another with often the nearest health facility being 8–12 kilometers away, possess maritime transport challenges. The cost of transporting a mother who needs SBA is about

55 US dollars, which includes hiring a boat with an engine, a coxswain and buying fuel for the trip (47). Most women might have decided to move to the mainland earlier for SBA to avoid these health facility geographic accessibility and high transportation challenges as has been noted in other settings (21, 48). It is likely that women who had SBA at the mainland were socio-economically well off and were able to afford the related expenses. We did not measure women's socio-economic status, however a higher proportion of women who had SBA from the mainland had completed at least eight years of formal education relative to those who delivered from the islands. Higher education has been previously linked to better socio-economic status (20, 49, 50).

Participants with spouses in none fishing related activities were likely to have had a SBA relative to those whose spouses were in fishing related activities. Fishing related activities are more engaging, as fishing is usually done overnight, with most of the daytime spent sorting the fishing gear for the next overnight fishing, leaving limited time for the men to support their women for SBA. Spouses engaged in fishing related activities spend more time away from home (51), eventually having less time to support their study participants for SBA. Men engaged in fishing and related activities often spend their hard-earned money on alcohol, transactional sex relationships and other HIV risky behavior (52), leaving no facilitation for SBA by their spouses.

Joint spouse and participant health care decisions were associated with SBA, as had been previously noted in other settings (19, 21, 53). Women are motivated by their spouses; they receive monetary facilitation, transportation arrangements, accompaniment to birth facility, attention to physical, psycho-social and other provisions that ease SBA. In these settings, men are usually less likely to participate in decisions made by the women alone or by third parties without the male partner's involvement. Involvement of spouses in maternal child health care issues has been previously shown to be associated with improved SBA (18, 21, 54). However, in some other settings, women's independence in health care decisions has been associated with more SBA (55), as joint decisions were perceived to slow down the process of accessing SBA.

Women who received any one of the seven components (blood pressure measurement, provision of a blood sample, provision of a urine sample, tetanus vaccination, IPTp, deworming treatment or iron and folate supplements) during ANC were likely to have had a skilled birth. This agrees with literature from most African countries(28). Women who receive components of ANC perceive that it is high quality care, are more likely to understand pregnancy-childbirth danger signs and might be more inclined to having SBA for fear having gotten these signs during childbirth. This indicates that improved receipt of components of ANC may improve SBA among women in these island FCs.

Women without history of pregnancy loss were likely to have had a skilled birth, contrary to previous work indicating that women who had a previous pregnancy loss were likely to have SBA to avoid another loss (20, 21). Women with history of a pregnancy loss might have had bad experiences during SBA and might have preferred unskilled births to avoid similar experiences.

Participants who had fewer than two lifetime child births were likely to have had SBA compared to those with more than two births. This is like previous work in other settings (11, 20–23, 25, 28). The first birth is usually given higher socio-cultural importance as a means of sustaining continuity of the family and community (12). This may sometimes lead to family members encouraging the woman to deliver from a health facility to increase likelihood of a live birth. Health workers usually emphasize first time pregnant women to deliver from a health facility to reduce likelihood of complications. Women with fewer lifetime child births are likely to be socio-economically well-off and might have found it easier to find someone who would take care of their family as they sought SBA, while those who had many births might have found it challenging to have a skilled delivery in the face of competing family-household demands that outstrip the SBA zeal. Many lifetime births might indicate limited access to health care

including family planning and SBA services. Besides, women with many lifetime births are likely to have more socio-cultural connections that may negatively influence the decision to have SBA. Furthermore, women who have had several child births without complications may become complacent, thinking that it is always the same normal childbirth, they consider SBA not important (20, 22).

Study limitations included; the use of self-reports which may be affected by social desirability reporting. This was minimized through use of a study team that is well known, not from within the FCs and trusted in these communities. Medical records were not accessed to compare with the self-reports as women had skilled births from different locations. Verbal autopsies for women who died during childbirth were not conducted.

Conclusion

This study provides valuable information on SBA and its predictors among these hard to reach island rural FCs, which is useful in designing tailored maternal health improvement interventions for such areas. There is need to improve skilled birth attendance in these FCs as most women move to the mainland for skilled births. Task shifting of some of the skilled attendants' roles to CHWs could help improve SBA in these island communities.

Abbreviations

AIC
Akaike's Information Criterion
ANC
Antenatal Care
AOR
Adjusted Odds Ratio
BIC
Bayesian information criterion
CHW
Community Health Worker
CI
Confidence Interval
COR
Crude Odds Ratio
FCs
Fishing Communities
FWA
Federal Wide Assurance
IAVI
International AIDS Vaccine Initiative
ICRH
International Center for Reproductive Health
IPTp
Intermittent Preventive Treatment with Sulphadoxine/pyrimethamine
MMR
Maternal Mortality Ratio

ODK
Open Data Kit
P
P-value
SBA
Skilled Birth Attendance
UVRI
Uganda Virus Research Institute
VHT
Village Health Team
WHO
World Health Organization

Declarations

Ethical approval and consent to participate: The study was approved by Uganda Virus Research Institute Research Ethics Committee [Federal Wide Assurance (FWA) number 00001354] and the Uganda National Council of Science and Technology (FWA number 00001293). Women aged 18 years and above were enrolled after providing written informed consent. Women adolescents aged 13–17 years were enrolled after documented emancipated minor consent if they were emancipated minors or assent, with documented consent from their parents or guardians.

Consent for publication: Not applicable

Availability of data and materials: The dataset used and analyzed during the current study is available from the corresponding author on reasonable request.

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Authors' contributions: AS, a PhD student, conceived the study, secured funding, training and coordination of field team, data management, cleaning, data analysis, interpretation of data and drafting of the manuscript. GN participated in the design, finalization of the protocol, reviewing progress, review and approval of manuscript. BO participated in the finalization of the protocol, reviewing progress, review and approval of manuscript. KC participated in the design, finalization of the protocol, reviewing progress, review and approval of manuscript. MP participated in the design, finalization of the protocol, reviewing progress, review and approval of manuscript. NK participated in conception of the idea, design of the study, reviewing study progress, drafting, review and approval of manuscript. OD participated in conception of the idea, design of the study, finalization of study protocol, reviewing

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Figures

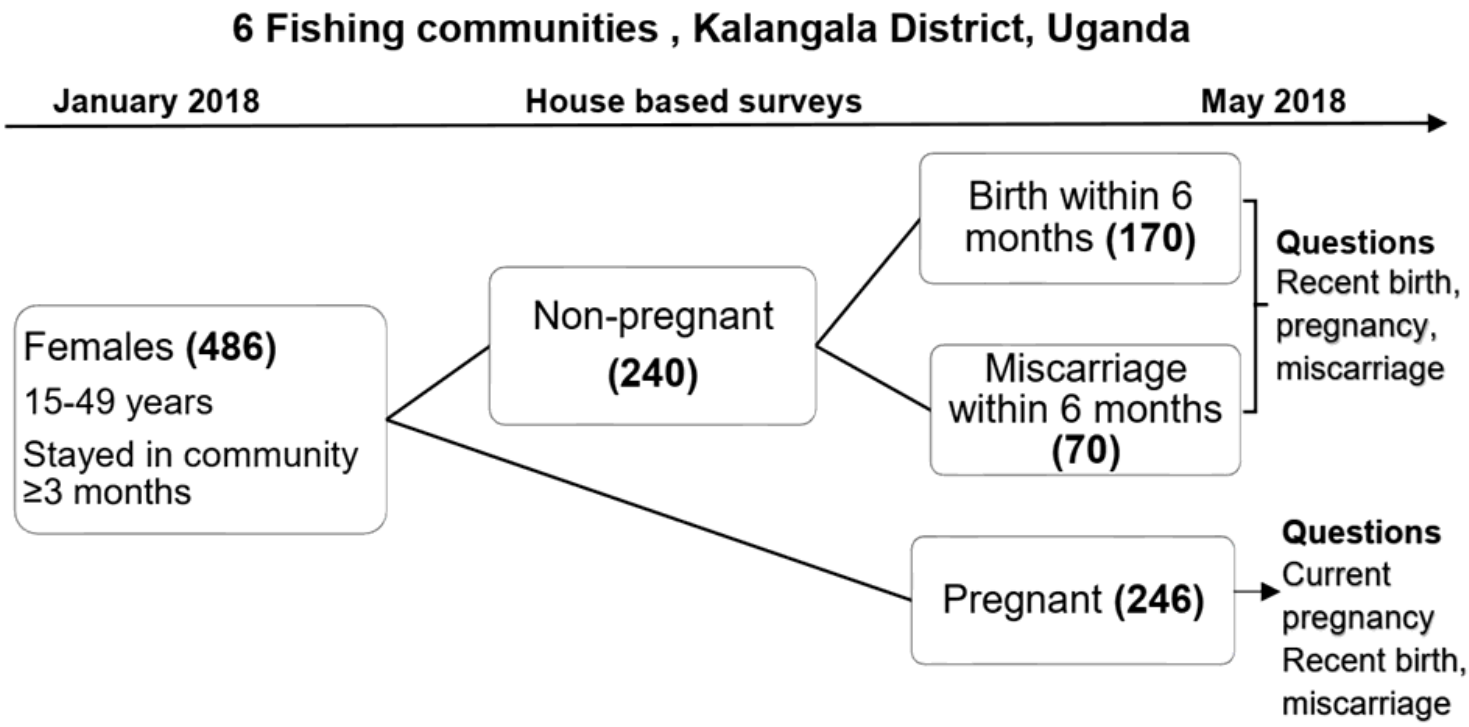

Figure 1

Study recruitment flow chart

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