

# Factors associated with utilization of maternal health services by female sex workers in Uganda: a Health facility-based survey

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## Research article

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# Abstract

**Introduction** Female sex workers (FSWs) are marginalized due to social rejection and stigma, especially in countries where the practice is illegal. Many FSWs are mothers but little is known about their utilization of maternal services. This study investigated the determinants of utilization of maternal services by FSWs in Uganda. **Methods** FSWs were recruited from the “Most at-Risk Initiative” clinics in Uganda. We analyzed data for 318 FSWs who had given birth within two years of the study to estimate the proportion of FSWs who used all the components of maternal services (antenatal, facility-based delivery and postnatal). The outcome variable (utilization of maternal services) was categorized as “recommended package” if the women received all the three services, “moderate” if they received any two and “limited/none” if they received only one or none of the services. Multinomial logistic regression analysis was used to quantify the impact of pregnancy planning and other factors on the utilization of maternal services. **Results** Overall, 25.2% (80) utilized all the three services in the recommended package of maternal services, 47.5% (151) had moderate utilization, while 27.3% (87) utilized limited or no services. Factors that influenced utilization of the recommended package compared to “limited/none” use were having a planned pregnancy (adjusted RRR (aRR) = 3.87; 95% CI = 1.40-10.67), knowing four as the minimum number of ANC visits (aRR = 2.43; 95% CI = 1.22-4.87), never having been criminalized for sex work (aRR = 2.48; 95% CI = 1.30-4.74) and not believing that health providers deny services to FSWs believing (aRR = 2.63; 95% CI = 1.37-5.07). **Conclusion** These findings confirm the relevance of pregnancy planning in the utilization of maternal services among FSWs. However, maternal health service utilization was generally low and interventions to reduce barriers including inadequate knowledge of ANC visits, internal stigma and criminalization of sex work are required. These are necessary steps in the move towards universal health coverage.

## Introduction

The utilization of maternal care services at a health facility improves the reproductive health of women [1, 2], but use of these services is still a challenge in sub-Saharan Africa (SSA), which accounts for 50% of the global maternal deaths [3]. Globally, there has been a reduction in the maternal mortality rate from 385 deaths per 100 000 live births in 1990 to 216 in 2015, however the absolute number of maternal deaths remains high at 303,000. The majority of the maternal deaths are from sub-Saharan Africa with estimates of 546 deaths per 100,000 live births compared to 12 deaths in high-income countries [4]. Uganda has 336 deaths per 100,000 live births [5], a figure below average for the SSA region, but still high. Further, within Uganda, maternal death disparities exist between women of high and low income status. Most maternal deaths could be averted if women accessed maternal health care equitably [6]

In the provision of maternal health services, the notion of “continuum of care (CoC)” has been recommended as a fundamental approach [7, 8] to ensure women receive essential services. There is a growing need to assess coverage of maternal services based on the frequency and the package of services accessed [9, 10]. This is intended to demonstrate the range of services provided as women attend maternal health clinics. Maternal health care assessment includes the number of antenatal care (ANC) visits, facility-based deliveries (FD), skilled birth attendance and postnatal care (PNC) visits [9]. To ensure CoC, when measuring the coverage of maternal services, the estimates should be based on the entire package of services received continuously from the pregnancy to post-delivery stages and not separate individual interventions [11]. For example, assessment of ANC utilization does not inform stakeholders whether those who used ANC services later delivered within facilities and received PNC.

Uganda has developed interventions to improve reproductive health services[12]. For instance at public facilities, health services including family planning, ANC, facility-based delivery, and PNC are provided free of charge to all women. In addition the number of households in a distance of less than 5 kilometers to health facility increased from 83.3% in 2012/2013 to 86.1% in 2016/2017[13]. These interventions resulted into fair utilization of maternal services. According to the 2016 Ugandan Demographic and Health Survey (UDHS) report, of women aged 15-49 years, 97% received at least one antenatal care, 73% had health facility delivery and 54% had PNC within 48 hours after delivery [5]. However the report

indicated that women in rural areas (64%) were more likely not to access maternal services compared to those residing in urban setting (44%).

Despite the available interventions, women in general population still face a number of challenges in utilizing the maternal services. According to 2016 UDHS, 41% of women in Uganda had unplanned pregnancies [5]. The literature shows that women with unplanned pregnancies are more likely to experience delayed and inadequate ANC attendances [14], deliver outside health facilities and not to likely to attend PNC [15]. Pre-conception care including pregnancy planning has the potential to maximize maternal and child health outcomes but has not been embraced globally [16]. Other factors that affect utilization of maternal health services in Uganda include education, income, mother's age, parity, place of residence, attitude of health providers [17-22], fear of mistreatment by clinic staff, cost and distance [23], previous ANC attendance, convenience of opening hours at ANC facility, and knowing the right time for ANC enrollment [24]. Further, most studies have concentrated on women in the general population, leaving out FSWs.

In Uganda sex work is illegal, yet many women earn a living from this job [25]. The majority of FSWs were of reproductive age [26]. According to a study conducted in northern district of Uganda, 45.0% (179/398) of FSWs had experienced unintended pregnancies [27]. Most of the studies and programs among sex workers in Africa have concentrated on addressing HIV and other sexually transmitted infections [28].

Generally, FSWs face challenges in utilizing health services, including the negative attitudes of health care workers, discrimination and lack of confidentiality by the service providers, and fear of being exposed as a sex worker, in addition to other barriers as mentioned by women in the general population. [29-32]. However, there is a paucity of information related to the utilization of maternal services by women whose job status is highly stigmatized. In this study we examined the level and determinants of maternal health care utilization among FSWs in Uganda.

## Methods

The data collection methods of this study have been described elsewhere [33]. Briefly, 819 participants who had a pregnancy within the last two years and aged 15-49 years were systematically recruited from four "Most at Risk Program Initiative" (MARPI) clinics in the central, northern, eastern and western regions of Uganda in 2017. The MARPI clinics were established as secluded places or clinics within public hospitals to provide HIV services to most at risk populations including female sex workers. There are no maternal services provided within the MARPI clinics. In this analysis, we extracted data for participants who had given birth, to ensure a complete analysis of the CoC up to the post-delivery period.

### Measurements and Variables of interest

#### 1) Dependent variable

We captured data on the utilization of ANC, place of delivery and attendance of postnatal care. Utilization of ANC was measured as the proportion of participants who attended at least four visits of ANC, coded as 1 and those who attended less than four times coded as 0. Four times was the recommended minimum number of ANC visits by study period [34] but this has since changed to a minimum of eight visits [35]. Participants who delivered within a health facility were coded as 1 and those who did not coded 0. Facility-based delivery (FD) was considered instead of skilled birth attendance as the validity of women's recall and identification of cadre of medical professional, is questionable [12].

Regarding PNC, participants were asked "Did you receive a health check within the six weeks after delivery". Participants who attended PNC within six weeks were coded as 1 and those who did not were coded 0. The period of six weeks was preferred to 48 hours or less since the majority 95.6% (304) of the participants had delivered within facilities. However not all participants who delivered within the health facility were reviewed by service providers before discharge. Missing PNC services while within health facility boundaries may not be the responsibility of the mother since the providers are expected to provide PNC to all mothers who deliver within the facility before discharge. Thus, mothers may not be responsible for

missing PNC within 48 hours. Moreover, mothers and babies in stable conditions are discharged after 24 hours in case of normal deliveries [36] and usually do not come back for PNC within 48 hours. Therefore, we opted to use the period of six weeks after delivery.

Utilization of maternal services was the outcome measure. This was estimated as utilization of maternal health services along the continuum from ANC (4+ visits), FD and PNC. Utilization of maternal services was grouped into three categories, namely the recommended package (coded as 1), moderate (coded as 2) and limited/no service package (coded as 3) [37, 38]

1. Under the recommended package the participants received all the three maternal services including ANC, FD and PNC
2. Moderate package: Participants received any two of the expected three services.
3. Limited/no service package: Received either one or none of the three maternal services.

## **2) Independent variables**

The determinants of maternal health services utilization among FSWs were conceptualized based on the Gelberg-Andersen Behavioral Model for Vulnerable Populations [39]. The variables were categorized into traditional and vulnerable (predisposing, enabling and need) factors. Predisposing factors these are considered as pre-existing conditions such as social and demographic factors; enabling factors include resources or barriers that allow or impede access to health services; and finally, need for care includes self-perceived need and objective evaluated health status[40]. These variables are illustrated in Table 1. Pregnancy planning was categorized according to the London Measure of Unplanned Pregnancy into three groups as unplanned (0-3), ambivalent (4-9) and planned pregnancy (10-12) [41, 42].

### **Table 1: Explanatory variables for MHC utilization and their operational definitions**

<b>Variable category</b>	<b>Operational definition/ assessment</b>
<b>Traditional Predisposing factors</b>	
Maternal age	Completed year since birth
Education	Formal schooling status starting from primary school
Marital status	Used to assess if the participant was single, married, separated, divorced, or widowed
Number of pregnancies	Count of previous pregnancies irrespective of birth outcome
Number of living children	Count of biological children who were alive
Social support	Any support received from friends, relatives, family members or health work in case the participants wanted to get pregnant
Type of father of the child	The fathers were categorized into emotional partners who FSWs had feelings with, and even if such men never paid after sexual intercourse the FSWs would emotionally be satisfied and non-motional where there was no emotional attachment.
Knowing the minimum ANC visits	Categorized into at least Four times; Less than four times and Do not know
<b>Vulnerable Predisposing factors</b>	
Workplace	These were main recruitment sites for FSWs clients and included streets, entertainment, homes and phones
Alcohol use	Participants were asked if they have ever taken any drink with alcohol, and if affirmative, mention frequency. According to AUDIT score those with < 7scores were considered as non-hazardous drinkers [58]
Crime	Participants were asked if "Have you ever been cautioned or charged by police, judge or magistrate in court because of a crime related to sex working?"
Drug use	We asked participants if they ever abused drugs , then categorized into Yes and No
Raped	In the year before the study, has anyone forced you to have sexual activities?
<b>Traditional enabling Factors</b>	
Wealth quintile	Estimated using principal component analysis from household items including a regular phone, computer, an income generating activity, an indoor bathroom, water source, electricity, car, generator, solar power source radio, television, bicycle, motorcycle, home ownership, and cell phone [5]
Extra income	Any other source of income besides sex work
Who you live with?	People participants lived with and these were categorized as any adult, children only and alone
Comfortable with opening hours of the facilities	Participants were asked; "How comfortable were you with the opening hours of the facility or facilities where you went for maternal services?"
<b>Vulnerability enabling factors</b>	We asked participants the following questions
Stigmatization	Do you believe that health providers refuse to treat sex workers when you go for antenatal and delivery? Response Yes/No
Discrimination	In lifetime as a sex worker have you personally been refused medical care after disclosing your job status? Response Yes/No
Disclosure of sex work with provider	Can you openly discuss your involvement in sex work with the provider? Response Yes/No
<b>Traditional Need Factors</b>	
Pregnancy intendedness/planning	Pregnancy planning categorized into unplanned "0-3", ambivalent "4-9", and planned "10-12".
Self-rated health status	In general, would you say your health is excellent, good, fair or poor?

Variable category	Operational definition/ assessment
<b>Vulnerability Need Factors</b>	
HIV status	HIV status as established during antenatal.

The completed tools were stored in lockable file cabinets. Data was entered, processed, and analyzed using EpiData software and STATA version 14.0.

### Data analysis

We extracted data for 318 participants who delivered within two years of data collection. Descriptive analysis was performed to generate background and other characteristics of participants including services received during ANC as well as coverage of CoC. Under coverage of CoC we show points in the continuum where important drop-outs occur.

We ran bivariate analysis to estimate the association between the selected independent variables and utilization of maternal services. Multinomial logistic regression was conducted to identify significant factors associated with maternal service utilization. All variables were introduced into the model after assessing for multicollinearity. Multicollinearity was tested using variance inflation factor (VIF) parameter, with acceptable range of 1–10 coefficients. All variables had VIF of less than 10. The relative risk ratios were estimated for all independent variables per category of the dependent variable except for the reference group which included women who received the limited/no service package. Backward step analysis was used and all variables not significant at level of 0.05 were eliminated starting with variables that contributed least (those of highest P-values of significance). Pregnancy planning status was maintained in the model throughout as the main independent measure. The goodness of fit of the final model was verified by the likelihood ratio test.

## Results

Among the 318 participants included in the analysis, the median age of the participants was 26 years (IQR 23-30), ranging from 15 to 43 years. A high proportion of the participants, 39.6% (126), were young women aged 15-24 years, and 56.6% (180) had not attained education beyond primary level. A relatively smaller proportion of women 11.6% (38) were married or in long term union. Regarding pregnancy intention/planning, 15.1% (48) had planned pregnancies. Overall, 70.7% (225) knew the required minimum number of four visits (4+ ANC). The other characteristics are illustrated in Table 2.

### Table 2: Characteristics of FSWs by selected variables

Variable	Categories	Frequency	Percentage
Age	15-24yrs	126	39.6
	25-29yrs	96	30.2
	>30yrs	96	30.2
Education	None_Primary	180	56.6
	O` level and _post	138	43.4
Marital status	Never married	110	34.6
	Married/union	38	11.9
	Divorce/separated /widow	170	53.5
Extra_income	Yes	105	33.0
Wealth Quintile	Lowest	83	26.1
	Second	71	22.3
	Middle	48	15.1
	Fourth	70	22.0
	Highest	46	14.5
HIV status	Positive	87	27.4
	Negative	231	72.6
Number of pregnancies	1-3	190	59.7
	4-20	128	40.3
Man who fathered last pregnancy	Emotional partner	235	73.9
	Non- emotional / Paying client_others	83	26.1
Number of living children	No child	136	42.8
	Has children	182	57.2
Who do you live with?	Adults (partner_friend_relative)	57	17.9
	Alone	66	20.8
	Children	195	61.3
Venue for recruiting clients	Street	81	25.5
	Entertainment place	99	31.1
	Residence/Home	20	6.3
	Phone	118	37.1
Alcohol use -Non Hazardous drinking	Yes	157	49.4
Substance use	Yes	127	39.9
Reported a supporter when pregnant	Friend	103	32.4
	relative	68	21.4
	Health worker	65	20.4
	None	82	25.8
Ever been raped	Yes	74	23.3
Self-rated health status	Good	125	39.3
	Fair	165	51.9
	poor	28	8.8
Discriminated/refused care	Never been refused care	194	61.0
	Ever been refused care	80	25.2
	Job not disclosed	44	13.8
Disclosure of sex work with provider	Never or Not always	182	57.2
	Always	136	42.8
Believe that FSWs can be denied care	Agree	62	19.5
	Disagree	256	80.5
Comfortable with opening hrs	acceptable	222	69.8
	unacceptable	96	30.2
Pregnancy intendedness	Unplanned	170	53.5
	Ambivalent	100	31.4
	Planned	48	15.1
Knew minimum ANC visits	No	93	29.3

## **Maternal health care**

Regarding ANC visits, 91.8% (292) attended at least once while 55.7% (177) made 4+ visits and 1.2% (6) made 8+ visits. Thirty-nine per cent (114) of women attended the first ANC within the first trimester of the pregnancy. Facility delivery was experienced by 95.6% (304) while PNC attendance within six weeks was by 44.0% (140).

## **Components received during ANC**

During ANC visits many participants did not receive all the expected services, as illustrated in figure 1. Overall, 86.6% (253) were tested for HIV, but among those who never tested during ANC, 7.8% (23) reported testing at other places and 5.5% (16) had never tested. Other services provided are illustrated in figure 1.

## **The CoC achievements and drop-outs**

Only 25.2% (80) of women utilized the recommended package of visit-based CoC, 47.5% (151) received the moderate package, while 27.3 % (87) utilized limited/no service. Among this last group, 2.5 % (8) never utilized any services. For both strands (a+b) , the highest drop-outs were observed between attending ANC at least once and 4+ ANC visits as well as between facility deliveries and postnatal care as illustrated in figure 2.

At bivariate analysis, explanatory variables significantly associated with the outcome variable ( $p < 0.05$ ) included: wealth quintile, persons the participants lived with, knowing the minimum number of times a pregnant mother is expected to attend ANC, ever having been charged with crime, and disclosure of job status. Other variables are summarized in Table 3.

## **Table 3: Utilization of maternal services by selected characteristics of Female sex workers**



Variable	Category	Type of services package utilized			#	Chi square test
		Ideal CoC(%)	Moderate CoC (%)	Limited/noCoC (%)		
<b>a) Traditional Predisposing factors</b>						
Age	15-24yrs	28.6	48.4	23.0	126	0.474
	25-29yrs	22.9	43.8	33.3	96	
	>30yrs	22.9	50.0	27.1	96	
Education	None or Primary	24.4	47.2	28.3	180	0.89
	Secondary and above	26.1	47.8	26.1	138	
Marital status	Never married	25.5	45.4	29.1	110	0.556
	Married/union	34.2	47.4	18.4	38	
	Divorce/separated /widow	30.0	48.8	28.2	170	
Number of pregnancies	1–3	28.4	47.9	23.7	190	0.114
	4–20	20.3	46.9	32.8	128	
Number of living children	No child	19.9	50.7	29.4	136	0.169
	Has children	29.1	45.1	25.8	182	
Aware of minimum ANC visits	No	21.5	37.6	40.9	93	0.002*
	Yes	26.7	51.6	21.8	225	
Man who fathered last pregnancy	Emotional regular partner	25.1	50.6	24.3	235	0.08
	Paying client_others	25.3	38.6	36.1	83	
Reported a supporter when pregnant	Friend	24.3	50.1	25.2	103	0.769
	Relative	26.5	51.5	22.0	68	
	Health worker	26.1	40.0	33.9	22	
	None	24.4	46.3	29.3	82	
<b>b) Vulnerability Predisposing Factors</b>						
Venue for recruiting clients	Street	22.2	45.7	32.1	81	0.21
	Entertainment place	29.3	41.4	29.3	99	
	Residence/Homes	40.0	35.0	25.0	20	
	Phone based	21.2	55.9	22.9	118	
Alcohol use	Non-hazardous drinking	26.8	46.5	26.7	157	0.811
	Hazardous drinking	23.6	48.4	28.0	161	
Substance use	Yes	22.1	44.1	33.8	127	0.101
	No	27.2	49.7	23.1	191	
Ever charged for crime	Yes	20.0	45.8	34.2	155	0.014*
	No	30.1	49.1	28.8	163	
<b>c) Traditional Enabling factors</b>						
Health quintile	Lowest	21.7	44.6	33.7	83	0.034*
	Second	21.1	42.3	36.6	71	
	Middle	21.9	47.9	29.2	48	
	Fourth	25.7	60.0	14.3	70	
	Highest	39.1	41.3	19.6	46	
Who do you live with?	Adults (partner_friend_relative)	40.4	42.1	17.5	57	0.038*
	Alone	18.2	48.5	33.3	66	
	Children	23.1	48.7	28.2	195	
Comfortable with opening doors	acceptable	26.8	43.8	29.4	160	0.406
	unacceptable	23.4	51.3	25.3	158	

Variable	Category	Type of services package utilized			#	Chi square test
		Ideal CoC(%)	Moderate CoC (%)	Limited/noCoC (%)		
<b>b) Vulnerability Enabling factors</b>						
Believe that FSWs can be denied care	Agree	24.2	35.5	40.3	62	0.029*
	Disagree	25.4	50.4	24.2	256	
Discriminated / Refused care	Never refused	26.3	47.4	26.3	194	0.061
	Ever been refused	18.7	43.8	37.5	80	
	Job not disclosed	31.8	54.6	13.6	44	
Disclosure of sex work with provider	Not always	18.1	51.7	30.2	182	0.004*
	Always	34.6	41.9	23.5	136	
<b>a) Traditional need factors</b>						
Pregnancy planning status	Unplanned	22.9	45.3	31.8	170	0.249
	Ambivalent	25.0	50.0	25.0	100	
	Planned	33.3	50.0	16.7	48	
Health status	Good	24.8	48.8	26.4	125	0.573
	Fair	24.2	49.1	26.7	165	
	Poor	32.1	32.4	35.7	28	
<b>c) Vulnerability need factors</b>						
IV status	Positive	23.0	46.0	31.0	87	0.646
	Negative	26.0	48.0	26.0	231	

\*Significant statistical difference between groups, Pearson`s Chi-square (P<0.05)

### Multinomial logistic regression modelling of factors associated with the CoC achievement

From multinomial logistic regression modelling (Table 4), holding other variables constant, having a planned pregnancy was associated with a higher probability of utilizing recommended package of maternal services (adjusted RRR (aRR) = 3.87; 95 % CI = 1.40-10.67) and moderate utilization (aRR = 2.73; 95 % CI = 1.04-3.16) relative to the limited/no service package. Likewise, knowing the recommended minimum number of ANC visits was associated with a higher probability using the recommended package of maternal services (aRR = 2.43; 95 % CI = 1.22-4.87) and moderate utilization (aRR = 2.55; 95 % CI = 1.42 - 4.60). In terms of criminalization of sex work, participants who had never been cautioned or charged by police, judge or magistrate in court because of a crime related to sex working compared to those who had ever been cautioned or charged had higher probability of utilizing the recommended package (aRR = 2.48; 95 % CI = 1.30-4.74) and the moderate package of services (aRR = 1.81; 95 % CI = 1.04-3.16). Participants who did not believe that health providers deny services to FSWs had higher probability of utilizing the moderate package of maternal services relative to limited/no service package (aRR = 2.34; 95 % CI = 1.17-4.64) and not with the recommended package relative to limited/no service. Participants who openly discussed their job status with health workers had higher probability of utilizing the recommended package of maternal services relative to limited/no service package (aRR = 2.63; 95 % CI = 1.37-5.07) and not with the moderate package relative to limited/no service package.

**Table 4. Crude and adjusted relative risk ratio estimates for utilizing Maternal Health services**

Table	Categories	Type of services package utilized						
		#	Recommended			Moderate		
			Proportions	Crude RRR (95%CI)	Adjusted RRR (95%CI)	Proportions	Crude RRR (95%CI)	Adjusted RRR (95%CI)
<b>Additional disposing tors</b>								
(yrs)	15-24yrs	126	36 (28.6)	1.00	1.00	61 (48.4)	1.00	1.00
	25-29yrs	96	22 (22.9)	0.76 (0.30-1.94)	0.67 (0.30-1.46)	42 (43.8)	0.70(0.31-1.61)	0.66 (0.34-1.30)
	>30yrs	96	22(22.9)	0.82 (0.27-2.44)	0.67 (0.30-1.48)	48(50.0)	0.72(0.28-1.88)	0.79 (0.40-1.57)
Education	None or Primary	180	44(24.4)	1.00	1.00	85 (47.2)	1.00	1.00
	Secondary and beyond	138	36 (26.1)	0.91 (0.42-1.97)	1.13 (0.43-1.83)	66 (47.8)	0.82 (0.42-1.61)	1.07 (0.61-1.87)
Marital status	Never married	110	28 (25.5)	0.00	1.00	50 (45.4)	1.00	1.00
	Married/union	38	13 (34.2)	1.71(0.46-6.36)	1.71 (0.56-5.22)	18 (47.4)	1.98 (0.60-6.52)	1.47 (0.53-4.12)
	Divorced*	170	51 (30.0)	1.32(0.57-3.02)	0.91 (0.45-1.84)	83 (48.8)	1.52 (0.75-3.11)	1.07 (0.59-1.95)
Number of pregnancies	1-3	190	54 (28.4)	1.00	1.00	91(47.9)	1.00	1.00
	4-20	128	26 (20.3)	0.59 (0.24-1.44)	0.51 (0.26-1.01)	60 (46.9)	0.81(0.38-1.73)	0.70 (0.40-1.23)
Number of living children	no child	136	27 (19.9)	1.00	1.00	69 (50.7)	1.00	1.00
	Has children	182	53 (29.1)	1.32(0.52-3.32)	1.18 (0.57-2.44)	82 (45.1)	1.08(0.49-2.41)	1.03 (0.55-1.90)
How many prenatal visits	Did not know	93	20 (21.5)	1.00	1.00	35 (37.6)	1.00	1.00
	Yes-Knew	225	60 (26.7)	2.46 (1.14-5.33)	<b>2.43(1.22-4.87)*</b>	116 (51.6)	2.79(1.43-5.41)	<b>2.55 (1.422-4.60)*</b>
Who was the emotional partner last pregnancy	Emotional partner	235	59 (25.1)	1.00	1.00	119(50.6)	1.00	1.00
	Non -emotional	83	21 (25.3)	0.93(0.40-2.14)	0.79 (0.38-1.64)	32(38.6)	0.59(0.28-1.22)	0.58 (0.30-1.09)
Who was the emotional partner last pregnancy	Friend	103	25 (24.3)	1.00	1.00	52 (50.1)	1.00	1.00
	Relative	68	18 (26.5)	0.72(0.25-2.12)	1.13 (0.45-2.89)	35 (51.5)	0.82(0.32-2.11)	1.13 (0.50-2.55)

Variable	Categories	Type of services package utilized						
		#	Recommended			Moderate		
			Proportions	Crude RRR (95%CI)	Adjusted RRR (95%CI)	Proportions	Crude RRR (95%CI)	Adjusted RRR (95%CI)
	Health work	22	6 (26.1)	1.03(0.36-2.98)	0.81 (0.33-2.00)	9(40)	0.60(0.24-1.52)	0.55 (0.25-1.21)
	None	82	20(24.4)	1.48(0.53-4.14)	1.09 (0.46-2.59)	38(46.3)	1.09(0.45-2.64)	1.0.89 (0.42-1.85)
<b>Verability disposing tors</b>								
ue for routing its	Street-based	81	18 (22.2)	1.00	1.00	37(45.7)	1.00	1.00
	Entertainment	99	29 (29.3)	1.17(0.45-3.02)	1.46 (0.62-3.40)	41(41.4)	0.75(0.33-1.68)	0.98 (0.47-2.03)
	Residence/Home	20	8 (40.0)	2.67(0.56-12.76)	3.15 (0.0.78-12.7)	7(35)	0.76(0.17-3.35)	1.09 (0.28-4.18)
	Phone	118	25 (21.2)	1.43(0.53-3.90)	1.54 (0.66-3.64)	66 (55.9)	1.52(0.67-3.48)	1.84 (0.90-3.72)
ohol use	Non-hazardous drinking	157	42 (26.8)	1.00	1.00	73 (46.5)	1.00	1.00
	Hazardous drinking	161	38(23.6)	1.07(0.49-2.35)	0.1.02 (0.52-2.01)	78 (48.4)	1.36(0.692.67)	1.34 (0.75-2.40)
stance use	Substance_ abuse	127	28(22.1)	1.00	1.00	56 (44.1)	1.00	1.00
	No substance abuse	191	52 (27.2)	1.07(0.49-2.35)	1.35 (0.70-2.66)	95(49.7)	1.62(0.83-3.14)	135 (0.77-239)
r been rged for ie related ex king	Yes	155	31(20.0)	1.00	1.00	71(45.8)	1.00	1.00
	No	163	49(30.1)	2.06 (0.96-4.46)	<b>2.48 (1.30-4.74)*</b>	80(49.1)	1.60(0.82-3.12))	<b>1.81 (1.04-3.16)*</b>
<b>Traditional bling tors</b>								
lth tile	Lowest	83	18 (21.7)	1.00	1.00	37 (44.6)	1.00	1.00
	Second	71	15 (21.1)	1.11(0.40-3.10)	0.88 (0.35-2.21)	30 (42.3)	0.96(0.41-2.26)	0.83( 0.40-1.78)
	Middle	48	11(21.9)	0.97(0.29-3.19)	0.99 (0.34-2.88)	23 (47.9)	1.22(0.45-3.30)	1.03 (0.43-2.51)
	Fourth	70	18 (25.7)	2.92 (0.91-9.30)	2.58 (0.92-7.22)	42(60.0)	3.12(1.15-8.49)	2.75 (1.13-6.69)

Variable	Categories	Type of services package utilized						
		#	Recommended			Moderate		
			Proportions	Crude RRR (95%CI)	Adjusted RRR (95%CI)	Proportions	Crude RRR (95%CI)	Adjusted RRR (95%CI)
	Highest	46	18 (39.1)	2.48(0.71-8.61)	2.31 (0.80-6.64)	19 (41.3)	1.24(0.40-3.86)	1.21 (0.46-3.21)
Who do you live with?	Adults (partner_friend_relative)	57	23 (40.4)	1.00	1.00	24 (42.1)	1.00	1.00
	Alone	66	12 (18.2)	0.24 (0.07-0.82)	0.26 (0.08-0.78)*	32(48.5)	0.54(0.18-1.58)	0.72 (0.28-1.86)
	Children	195	45 (23.1)	0.40(0.14-1.12)	<b>0.34 (0.13-0.84)</b>	95 (48.7)	0.69(0.26-1.85)	0.70 (0.31-1.64)
Acceptable waiting hours	Acceptable	160	43 (26.8)	1.00	1.00	70(43.8)	1.00	1.00
	Unacceptable	158	37 (23.4)	0.87 (0.45-1.66)	0.52 (0.25-1.11)	81(51.3)	1.44(0.75-2.75)	1.19 (0.68-2.09)
<b>Perceived barriers</b>			vvv					
Ever refused care or closure	Never refused	194	51(26.3)	1.00	1.00	92(47.4)	1.00	1.00
	Ever been refused	80	15 (18.7)	0.81(0.32-2.04)	0.71 (0.31-1.60)	35(43.8)	0.68 (0.30-1.55)	0.69 (0.35-1.34)
	Job not disclosed	44	14 (31.8)	2.59 (0.73-9.17)	2.67 (0.89-8.02)	24(54.6)	2.08 (0.61-7.06)	2.25 (0.81-6.20)
Always used sex work with provider	Not always	182	33(18.1)	1.00	1.00	94(51.7)	1.00	1.00
	Always	136	47 (34.6)	2.75 (1.19-6.35)	<b>2.63 (1.37-5.07)*</b>	57(41.9)	1.44(0.75-2.75)	1.09 (0.61-1.94)
Even though providers can be provided care	Yes	62	15 (24.2)		1.00	22 (35.5)	1.00	1.00
	Disagree	256	65 (25.4)	1.33(0.54-3.26)	1.61(0.74-3.51)	129 (50.4)	2.25(1.01-5.00)	<b>2.34 (1.17-4.64)*</b>
<b>Additional factors</b>								
Unplanned pregnancy ending in loss	Unplanned	170	39 (22.9)	1.00	1.00	77(45.3)	1.00	1.00
	Ambivalent	100	25 (25.0)	1.31 (0.56-3.06)	1.68 (0.81-3.48)	50(50.0)	1.20(0.59-2.46)	1.60(0.86-2.97)

Variable	Categories	Type of services package utilized						
		#	Recommended			Moderate		
			Proportions	Crude RRR (95%CI)	Adjusted RRR (95%CI)	Proportions	Crude RRR (95%CI)	Adjusted RRR (95%CI)
	Planned	48	16 (33.3)	3.15 (1.02-9.73)	<b>3.87 (1.40-10.67)*</b>	24 (50.0)	2.11(0.76-5.85)	<b>2.73(1.08-6.93)*</b>
Marital status	Good	125	31(24.8)	1.00	1.00	61(48.8)	1.00	1.00
	Fair	165	40 (24.2)	1.23 (0.55-2.75)	1.10 (0.55-2.24)	81(49.1)	1.25(0.62-2.51)	1.27 (0.702.32)
	Poor	28	9 (32.1)	0.90(0.25-3.27)	0.89 (0.29-2.69)	9(32.4)	0.52(0.15-1.73)	0.55 (0.19-1.58)
Fertility status								
	Positive	87	20 (23.0)	1.00	1.00	40 (46.0)	1.00	1.00
	Negative	231	60 (26.0)	1.22 (0.52-2.84)	1.14 (0.55-2.39)	111(48.0)	1.10(0.54-2.25)	1.17 (0.63-2.18)

\*Divorced includes separated and widowed; \* significant variables  $p < 0.05$

## Discussion

This study assessed the relationship between pregnancy planning and continued participation in the continuum of utilization of maternal services among FSWs in Uganda. The findings from our study show that participants who had planned pregnancies were more likely to utilize maternal services, particularly at the recommended level of maternal services. Other drivers of maternal services identified were never having been cautioned or charged due to sex working, knowing the number of ANC visits, disagreeing with the statement that FSWs could be denied maternal services due to job status, openly discussing sex work with service providers, and living with adults at home. Previous literature shows that women in the general population who plan for pregnancies are more likely to use subsequent maternal services [14, 15, 43, 44]. This study adds to this body of knowledge by focusing on a marginalized key population in Uganda.

In terms of CoC, in this study about a quarter (25.2%) of participants received the recommended CoC of maternal services based on visits. The coverage was slightly higher compared to 16% reported in another study for the general population in sub-Saharan Africa where participants were recruited at household level [45]. The observed difference in proportions could be attributed to places of recruitment of participants. Our study was health facility based and might have skewed participation towards women who are more likely to utilize health services including maternal services. Along the CoC cascade, a high proportion of drop-outs were observed between attending ANC once and four focused ANC as well as before postnatal care. Similar trends have been observed in the general population [45]. These are time-points that require focused interventions to minimize drop-out along the CoC.

Though nearly all (91.8%) participants attended ANC at least once, a substantial proportion did not receive all the expected services during ANC. Important to note are the participants who were not tested for HIV during ANC, yet they had never been tested elsewhere. According to the HIV testing services policy, FSWs and other key populations are expected to be re-tested after every three months [46] and all pregnant women who are not known HIV+ should be tested at their first ANC visit. In this study we did not investigate reasons for not receiving all the recommended services during ANC. Other studies conducted in Uganda in the general population have alluded to late attendance of ANC, poor staffing and lack of diagnostic equipment as impediments to the provision of good quality ANC services [47, 48].

Multinomial logistic regression shows that women who knew the expected number of ANC visits were more likely to utilize maternal services. This was congruent with findings from other studies which showed that a participant's prior knowledge about maternal health is a strong predictor of the utilization of health services during pregnancy [49, 50]. However, expectant mothers should be encouraged to attend ANC within first trimester or soon after recognizing their pregnancies, if they are to receive adequate maternal services, [51].

The findings indicate decreased utilization of maternal services among FSWs who had ever been charged or cautioned for a sex work-related crime. Since sex working in Uganda is illegal, FSWs have reported being harassed by government security organs such as the police [27]. An in-depth review from India revealed that such negative experiences make the FSWs intrinsically distrustful of any government institution [52]. Consequently, the FSWs end up avoiding or occasionally visiting government healthcare facilities despite having free maternal services.

Though denial of services by health workers after the disclosure of job status as sex worker was not a significant factor, we observed that internal stigma was a deterrent to the use of maternal services provided in general health facilities. In particular, participants who agreed that sex workers were stigmatized when they reveal their job status as well those who reported not openly discussing their job status as sex workers were less likely to use the recommended package of maternal services. In Uganda, health workers have been sensitized not to discriminate against sex workers as a public health approach to increase utilization of health service by key population to reduce HIV prevalence in the country.

However, other studies have revealed that unfriendly behaviour by a service provider, such as denying the FSWs service after disclosing their job status, was a deterring factor to the utilization of maternal services. A qualitative study conducted in a neighboring country Tanzania, that aimed to explore the pregnancy experience of FSWS and their utilization of antenatal services showed that the sex workers who revealed their job status were denied treatment. Consequently, FSWs resorted to concealing their job status and this complicated the provision of appropriate comprehensive services [53]. From other studies, FSWs alluded to providers delivering services in a hateful manner after disclosure of job status [54, 55].

As the notion of universal health coverage gains momentum, [56], there is need to address factors that deter this marginalized population from accessing maternal services. Interventions are needed to promote the provision of an adequate range and quality of maternal services to all women in a non-discriminatory manner as well as designing interventions to address internal stigma among FSWs. Focusing on the rights-based approach should be the way to achieve the sustainable development goals [57].

## **Strength and Limitations**

In this study we assessed the utilization of maternal services along the cascade of CoC. This provides an opportunity to identify areas where most drop-outs occur along the continuum and critical areas for intervention to enhance utilization of maternal health services in this vulnerable group. However, our findings need to be interpreted with caution as the study was facility based and the estimates for utilization could be higher than those in the community. Consequently, our findings may not be generalizable to all FSWS in Uganda.

## **Conclusion**

Our findings show that there was inadequate utilization of maternal services along the CoC by FSWs and major drop-outs along the CoC cascade. The services provided during ANC were also suboptimal. The drivers of maternal service utilization include pregnancy planning, knowledge about recommended ANC visits, living with adults, criminalization of sex work and internal stigma. These findings should be taken up by the implementers to design interventions to overcome challenges such as the criminalization of sex work, internal stigma and inadequate knowledge of ANC visits to improve utilization of maternal services by FSWs in Uganda.

## List Of Abbreviations

ANC :	Antenatal
aRR :	Adjusted relative risk ratio
CI :	Confidence interval
CoC :	Continuum of care
FD :	Facility- based deliveries
FSWs :	Female sex workers
HIV :	Human immunodeficiency virus
MARPI:	Most at Risk Program Initiative
PNC :	Postnatal care
STI :	Sexually transmitted infection

## Declarations

### Ethics approval and consent to participate

Ethical approval was obtained from both Makerere University School of Public Health Higher Degrees, Research and Ethics Committee and the Uganda National Council for Science and Technology (*No: SS 4262*). Participants provided written informed consent. All data were anonymized to ensure confidentiality of participants by not recording names on the data collection tool. Participation was voluntary, and women were informed that they could withdraw from the study at any time with no negative consequences.

### Consent for publication:

Not applicable in this section.

### Availability of data and material

The datasets generated are not publicly available as sex work is illegal in Uganda. We have a concern that the women who participated could be in trouble in case, they are accidentally identifiable. The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

### Competing interests

The authors declare that they have no competing interests

### Funding

The Ministry of Health and The Global Fund to Fight AIDS, Tuberculosis and Malaria supported data collection as part of evaluation of Sexual and Reproductive Health/Family Planning integration study. The funding bodies had no role in the design of the study, collection, analysis, interpretation of data, and in writing the manuscript.

### Authors' contributions

JNB conceptualized and wrote the study design, participated in collection, analysis and interpretation of data and wrote the first draft of the manuscript. RW participated in conceptualizing the study and editing of the study proposal and the manuscript. GB contributed to the writing of proposal the manuscript. FK contributed to the writing of the manuscript. DG



contributed to conceptualization of the study design, data analysis and writing of manuscript. All authors edited the entire manuscript, and approved the final version.

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# Figures

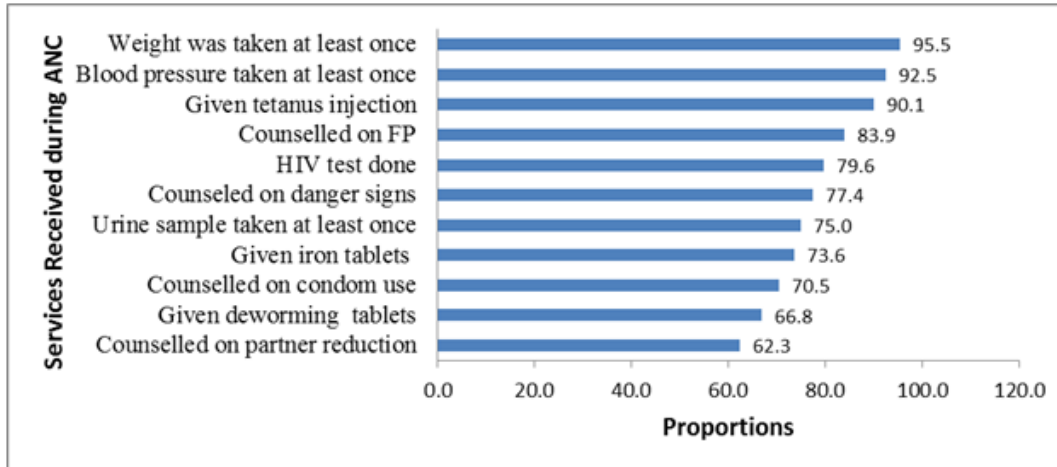


Figure 1

Services received by participants during antenatal visits



Figure 2

2 Cascade of CoC through PNC a) For all participants who gave birth within two years before recruitment (N=318) b) For only participants who had planned pregnancies (N=48)