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# Prevalence and factors associated with health facility-based deliveries among urban slum settlers in Lubaga Division, Kampala District, Uganda: a community-based cross-sectional study

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## Abstract

**Background** Health facility-based delivery (HFD) is a critical intervention for maternal and newborn health. In low- and middle-income countries, the proportion of pregnant women who deliver at health facilities has increased over time. Nevertheless, a proportion of women among urban slum settlers do not use this service. This study aimed to assess the prevalence and factors associated with a HFD among urban slum settlers in Lubaga Division, Kampala city, Central Uganda.

**Methods** An analytical community-based cross-sectional study was conducted among 384 women aged 15–49 years who had delivered within two years prior to data collection, selected from randomly sampled households in slum settlements of Lubaga Division. Data were collected using a semi-structured questionnaire and analyzed in Stata 15. HFD was measured as a binary outcome (0 = non-facility delivery; 1 = facility delivery). Association between independent factors and a HFD were determined by multivariable regression across predisposing, enabling, and need factors based on the Andersen and Newman Health Services Utilization Framework.

**Results** Out of the 384 women, 300 delivered in health facilities, representing an estimated prevalence of 78.1% (95% CI: 73.1–82.2) in the urban slum settlements of Lubaga Division. The key factors associated with health facility delivery included; parity (aOR = 272; 95% CI: (42.88-1725.4; p = < 0.001), waiting time of less than one hour at the health facility (aOR = 180.9; 95% CI: (7.54–434.1; p = < 0.001), health worker availability (aOR = 35.2; 95% CI: (5.87-194-61; *p* = 0.001), attending more than four antenatal visits (aOR = 24.1; 95% CI: (3.59-161.29; p = < 0.001), partner's post-primary education (aOR = 18.5; 95% CI: (6.43-53-54; p = < 0.001); positive attitude of health workers (aOR = 6.9; 95% CI: (1.55–30.53; *p* = 0.011), and maternal age below 30years (aOR = 3.5; 95% CI: (1.06–4.36; *p* = 0.039).

**Conclusions** Most women in Lubaga Division delivered in health facilities. Factors associated with health facility-based delivery included parity, waiting time of less than one hour at the health facility, health worker availability,

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attending more than four antenatal visits, partner's post-primary education, positive attitude of health workers, and maternal age below 30years. Targeted interventions focused on; education, economic empowerment, financial assistance programs and improved quality of care may further increase facility-based deliveries in Lubaga Division and similar settings.

**Keywords** Facility-based delivery, Urban slum settlers, Kampala, Uganda

## Background

Maternal health is a critical issue confronting the world today, and in 2023, the global MMR was estimated at 197 deaths per 100,000 live births [1, 2]. Health facility delivery means giving birth inside a medical location like a hospital, clinic, or birthing Centre, attended by skilled health workers and is crucial for improved maternal/newborn safety due to access to emergency care, monitoring, and expertise [3, 4]. Approximately 800 women worldwide fall victim to daily preventable deaths related to pregnancy and childbirth, which is very far from reaching the UN Sustainable Development Goal target MMR of 70 deaths per 100,000 live births [1, 5, 6]. Sub-Saharan Africa contributes 70% of the global MMR [7].

The Global SBA Rate is estimated at 81% of live births worldwide were attended by a skilled health professional but indicates that nearly 1 in 5 births still occur without the care of a trained professional, primarily in low-income countries and rural areas [2]. Furthermore, the Regional Prevalence Estimates variations in SBA rates are; Africa: 77%, The Americas: 97%, South-East Asia: 89%, Europe: 99%, Eastern Mediterranean: 82% and Western Pacific: 97% [2, 7].

The major causes of maternal deaths are direct causes which include hemorrhage, infections, unsafe abortion, obstructed labor, and hypertension during pregnancy [1, 8], which can effectively be managed if women utilize health services [9–12], especially delivery from a health facility under a skilled birth attendant [5, 9, 13]. As skilled delivery coverage in a country increases, maternal mortality decreases [12]. Although urban health facilities are better able to provide labor and childbirth facilities than rural clusters are, these services may not be readily available for disadvantaged urban areas, such as slum settlers [12, 14].

In sub-Saharan Africa, a relatively large proportion of deliveries still take place without a skilled attendant or outside health facilities [15–17]. The utilization of facility-based delivery (HFD) is affected by sociocultural norms and several other factors, including the age of the woman, education level, antenatal care attendance, cost of healthcare services, occupation, distance to the nearby health facility, knowledge of obstetric complications, and availability of quality services [15–20]. The lifetime risk of maternal death in low-income countries as a whole is 1 in 40, approximately 400 times (1 in 16,000) greater than that in high-income countries [7]. Factors that have been associated with increased risks of poor urban women dying from pregnancy and pregnancy-related conditions include home delivery, poverty, and fewer antenatal care (ANC) consultations [21]. Women with no formal education, those in the poorest wealth quintile, those residing in rural areas, and women with high parity were significantly more likely to deliver at home [12]. Similarly, long distance to the nearest health facility and lack of transport, negative experiences with health workers, including abusive language and neglect, perceived high cost of services (even when officially free) and lack of drugs and supplies at facilities were also major deterrents. However, male partner support was a key enabler for facility delivery [22]. Many countries have registered improvement in the delivery of Maternal and Child health services. Despite these gains, women residing in urban informal settlements and slums still experience significant barriers in accessing the critical services. A study using data from Nairobi Urban Slums Health and Demographic Surveillance System (NUHDSS), conducted by Atahigwa et al., found that an estimated 19.3% of the deliveries occurred at home [3, 23]. This implies that under such circumstances, the obstetric emergencies that develop during labour and child birth cannot be effectively managed for home deliveries.

Uganda's maternal mortality ratio (MMR) has significantly declined with recent estimates from the 2022 Demographic and Health survey (UDHS) showing 189 deaths per 100,000 live births, down from 336/100,000 live births in 2016 [24], a roughly 49% decrease in the last decade. Furthermore, the population-based maternal mortality ratio dropped by 30% in one year, which coincided with a 62% increase in the institutional delivery rate [25, 26]. The regional maternal mortality ratio for Kampala district was estimated at 201 per 100,000 live births in 2023 and 178 per 100,000 live births in 2024 [2, 13]. Despite this improvement, Uganda is very far from reaching the UN Sustainable Development Goal target MMR of 70 deaths per 100,000 live births, especially for under-served residents like urban slum settlers [1, 5, 6]. In Uganda, nearly nine in every ten (86%) of the live births were delivered in a health facility and that 88% were assisted by a skilled provider. This is an indication that fewer than a quarter of the births occurred outside the health care setting [19, 24].

In agreement with World Health Organization guidelines for antenatal, labor and childbirth, the Ministry of

Health in Uganda recommends that all women receive at least eight antenatal (ANC) contacts and deliver from a health facility under a skilled birth attendant [13, 27]. The Uganda government and development partners continue to provide maternal and child health/antenatal care (MCH/ANC) services and products; however, the utilization of these services is low and continues to be affected by environmental, social and technical barriers. Uganda has a clear and well-structured policy expecting all mothers to deliver within a tiered network of health facilities to ensure skilled care, from the village level to level 5, the district hospital. At village level, there is the village health team **(VHT)**, these do not conduct delivery, and they are the first point of contact for health education, mobilization, and identifying pregnant women for referral to a health facility. At level 2, there is Health Centre II (HC II), the lowest-level facility expected to conduct normal, uncomplicated deliveries. Level 3; Health Centre III (HC III); provides all services of HC II plus basic emergency obstetric care (BEmOC), including administering antibiotics, oxytocin, and anticonvulsants. Serves as a referral for HC IIs. Level 4; Health Center IV (HC IV); a mini-hospital that provides comprehensive emergency obstetric care (CEmOC), including the ability to perform Caesarean sections (C-sections). Level 5 General/District Hospital; provides comprehensive CEmOC and serves as the main referral center for all lower-level facilities within a district [28].

A study conducted among urban slum dwellers in Kampala Central Division, found that only two-thirds of the women delivered in a health facility. Factors associated with HFD included access to information from media and attendance of antenatal during the first trimester, both had positive association with HFD. In contrast Antenatal care attendance in the second and third trimester was associated with reduced chances of delivery in a health facility. For numerous reasons, however, some women do not seek skilled care because of the cost of service, the distance to the health facility, and the quality of care, thereby resulting in coverage of 88% skilled deliveries despite the various strategies being put in place [22, 24, 29]. This could be worse for vulnerable communities like the urban poor, which, in many cases, are taken for granted. The study aimed to determine the prevalence and associated factors of health facility-based deliveries among urban slum settlers in Lubaga Division, Kampala District, Uganda.

## Methods

### Study design rationale

This was a community-based cross-sectional analytical study using quantitative methods of data collection and analysis. A cross-sectional study design has strengths in describing the study population characteristics, measuring the prevalence of a targeted health outcome and identifying the determinants of the studied health outcome with data collected at a single point in time [30, 31]. Furthermore, the design is cost-effective, time saving and therefore suitable for limited time and financial constraints. The study was carried out for six months from October 2022 to March 2023 among six parishes, namely, Lubya, Kasubi, Busega, Kabowa, Lubaga and Nateete in the Lubaga division, Uganda.

### Study setting and rationale

The Lubaga division is located in the western part of the Kampala district and contains 13 parishes, 12 of which have informal settlements. The division has a total of 113,516 households, with a total household population of 327,998 and an average household size of 2.9 people [32, 33]. The main economic activities include groceries, restaurants, garages, and furniture shops. Despite the absence of and inadequacy of basic social amenities [34], all informal settlements have access to health services and facilities, including hospitals, health centers, clinics and maternity nursing homes, the majority of which are owned by private health providers who charge fees for services [28]. Because of their low economic status, many women seek care from publicly owned health facilities [35]. This site was chosen due to persistent and unique urban poor challenges; high maternal and neonatal mortality risk, overcrowding, gaps in specific local data and persistent barriers to access despite the presence of health facilities.

### Inclusion criteria and exclusion criteria

This study included all mothers with proven record of their last delivery not exceeding two years regardless of the outcome and was were residents of Lubaga division for the past six months prior to data collection, and also consented to take part in the study. The study excluded all mothers whose babies were sick and women who were critically ill or mentally disabled or not permanent residents during the data collection period.

### Study population and sampling

The study population included mothers (15–49 years) who had delivered in the previous two years and were residents of the Lubaga division 6 months prior to data collection. We used Cochran's formula for infinite or large populations, $n = z^2$. P (1-P)/$E^2$. For 95% confidence level, Z = 1.96, E=+/-5%=0.05, and $P = 0.5$, assuming maximum sample of 50%. Then was calculated $n$= ($1.9^2$ *$0.5^2$)/$0.005^{2=}$384. To obtain a total number of 384 respondents, the following procedure was followed. Six parishes of Lubya, Kasubi, Busega, Kabowa, Lubaga and Nateete were purposively selected due to the higher number of informal settlements than the other parishes,

and these parishes had 94 zones in total [32]. Zone names per parish were written on pieces of paper, folded and put in a box for the researcher to randomly select 47 zones. Of the 47 zones, 14 zones [households = 17,697] from Lubya, 10 zones [households = 16,542] from Kasubi, 8 zones [households = 9,346] from Busega, 6 zones [households = 9,898] from Kabowa,5 zones[households = 8,444] from Lubaga and 4 zones [households = 7,349] from Natete [24]. The sample size was distributed to the selected zones in proportion to their population. The total number of households was 69,276; number of eligible women was 384. At the zone level, households were selected by systematic random sampling on the basis of a sampling frame (list of households) obtained from the Village Health Team (VHT). The sampling frame included a list of all households within the selected zone, that received deliveries in the last 2 years. The sampling interval was every 85th household from each zone. This was determined by dividing the total number of households by the allocated sample size. The first household from each zone was randomly selected. If more than one eligible woman was encountered in the household, papers were folded and put down for mothers to choose to determine the woman to be interviewed [36]. When no eligible woman was identified in the selected household, the next selected household was the nearest, and the same inclusion criteria were applied.

#### Data collection tool and approach

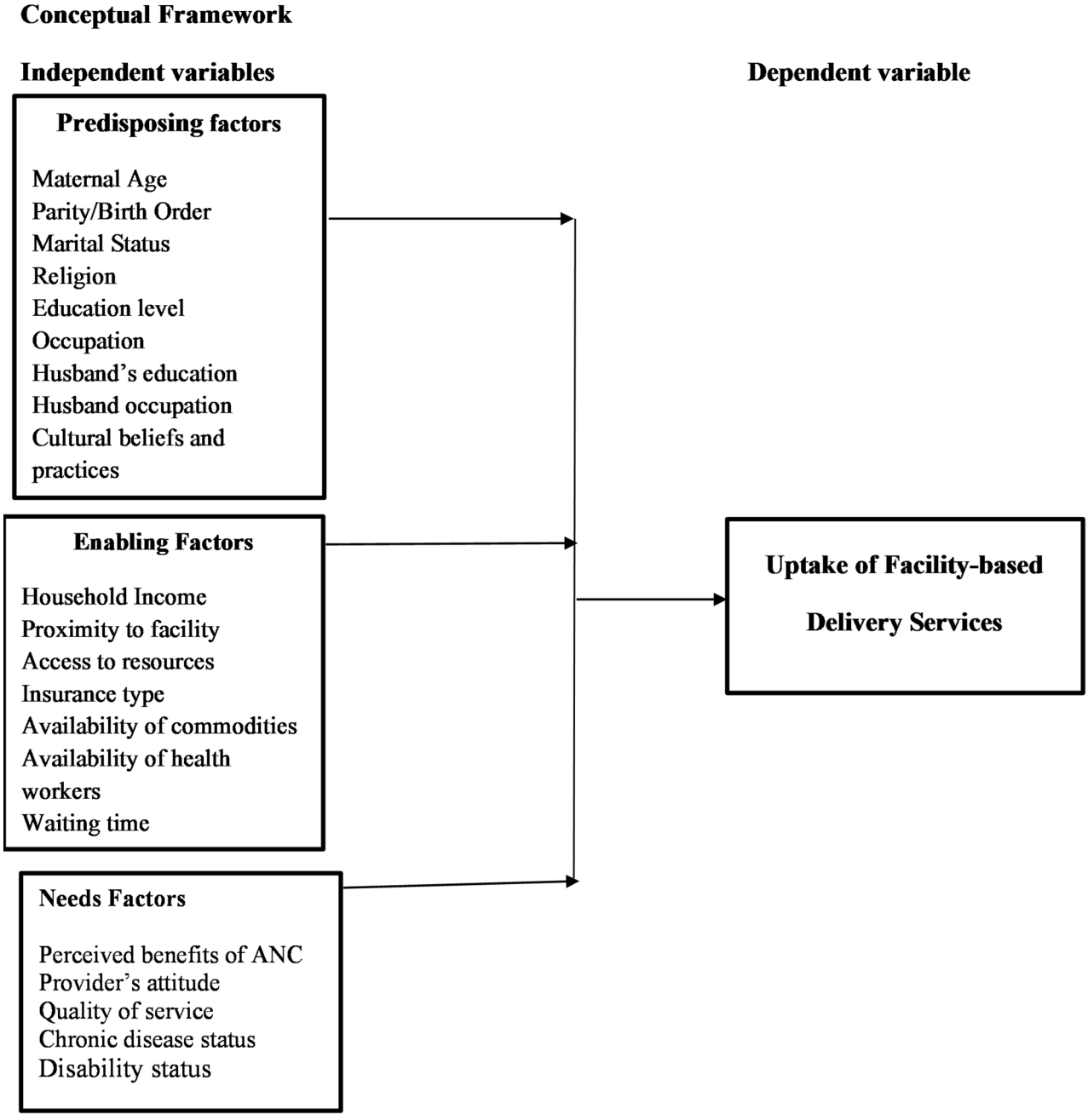
We used a structured interviewer-administered questionnaire that was developed for this study (supplementary material). This was developed via Andersen's behavioral model (ABM) of health services utilization, which is used as a theoretical framework [37–39]. Using the ABM model, we assumed that predisposing, enabling, health service delivery and need factors would predict that a woman delivers from a facility. The variables under each factor category were formulated into a question item fitted in a tool. The tool was reviewed by an expert in maternal and newborn research. The research tool was pretested in the community of the Kisenyi II settlement among twenty women in the Kampala central division, which has characteristics similar to those of the study population. All the necessary corrections and adjustments were carried out before the commencement of data collection. The interviews were conducted on a one-on-one basis in the local language (Luganda) by trained research assistants who had trained for three days. Verbal and written consent were obtained from the respondents before the questionnaire was administered. The interviews took place in spaces that the respondents found in the home they lasted for an average of 40 min. Only one respondent was present and interviewed at a time.

#### Study variables and measurement of variables

All variables were measured using self-reports. The dependent variable for this study was the woman's delivery in a health facility, which was measured as a dichotomy ('Yes'=1, and 'No' =0, if delivery took place or not in a health facility, respectively). Health facilities included; clinics, health centres, hospitals (district, regional and national), whereas non-facility include; Traditional Birth Attendant, home. The independent variables were the predisposing, enabling, health service delivery and need factors based on the ABM model [37–39]. The predisposing factors included age (measured in completed years), religion, and marital status, and enabling factors included partner education and occupation status. The availability of health services was measured by asking whether the participant was attended to by the health worker during her most recent visit to a health facility prior to data collection. Health workers' attitudes were measured by determining whether the participant was treated well or not during her most recent visit. Availability of services and commodities was assessed by asking whether the participant was able to receive the essential drugs and supplies such as cotton wool and gloves at the health facility. Women's perceived need for healthcare was measured by the timing of the first antenatal and the frequency of subsequent ANC visits [40, 41].

#### Data management and analysis

Data checking and cleaning were performed simultaneously with data collection. At the end of every day, the data were checked for completeness and consistency. The data were backed up by saving in different folders on the computer and on a removable flash disk. The data were exported to Stata 15 for analysis. Univariate analysis was performed to provide descriptive statistics for background characteristics and descriptions of the indicators; this was presented as frequencies and percentages in tables. The prevalence of Health facility delivery was measured as a binary dependent variable with values of 0 = no delivery in the health facility and 1 = delivery in the health facility. Bivariate analysis was executed via logistic regression (LR) to compute the unadjusted odds ratios and corresponding p values at 95% statistical significance fitting the potential determinants one by one [37, 38]. Multivariate analysis was performed on the




variables that were statistically significant in the bivariate analysis or with p values equal to or less than 0.05 via the logistic regression model to control for confounding factors and to determine independent predictors of health facility-based delivery. Statistical significance was set at a p value < 0.05, and a 95% confidence interval (95% CI) was used. The likelihood ratio test was used to assess the overall model fit [42].

**Table of legend meanings**

| Term/symbol | Meaning/explanation | Reference Category |
|---|---|---|
| UOR | Unadjusted odds ratio –is a measure of association before accounting for other factors. | 1.0 (CI at 95%) |
| AOR | Adjusted odds ratio- is a measure of association after accounting for confounders | 1.0 (CI at 95%) |
| CI | Confidence interval-a range of values that is likely to contain the true value of a study estimate | 95% CI = 1.3–3.1 |
| HF | Health facility-an established location where health services are delivered by trained health workers. (Hospital-public and private, Health centers, Clinics, Maternity homes) | |
| HW | Health worker-is a person who is trained to provide health-related services to individuals, families or communities to improve health, prevent diseases, treat patients or provide care and support. (Doctors, Clinical officers, Nurses, Midwives) | 1.0 (CI at 95%) |
| ANC | Antenatal care | 1.0 (CI at 95%) |
| P value | | < 0.05 |

### Ethics approval and consent to participate

The study was conducted following the Declaration of Helsinki. The study was reviewed and approved by Uganda Martyrs University, and ethical approval was obtained from the Kampala Capital City Authority (KCCA) Research Ethics Committee, KCCA-REC (Ref: LUB/KCCA/005/09) based on the National Guidelines for Research Involving Human Participants in Uganda. These guidelines cover general provisions, participant rights and welfare, the informed consent process, the standard of care, and the responsibilities of various stakeholders in research. Administrative permission to conduct the study was obtained from the Town Clerk Lubaga Division and from the chairpersons of the local councils of Lubya, Kasubi, Busega, Kabowa, Rubaga and Nateete parishes.

To ensure that all the prospective participants made informed consent regarding whether or not to participate in the study, the investigator and research assistants thoroughly explained the purpose, objectives, risks and benefits of the study, and the data collection procedure using the local dialect they best understood. Written informed consent was obtained orally from each participant and was further confirmed by imprinting the thumb print on the consent form. The confidentiality of the participants was carefully observed throughout the data collection, analysis, and dissemination phases, thereby upholding the ethical standards of research.

**Table 1** Background characteristics of the sample participants ($n = 384$)

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Age in years | 18–29 | 296 | 77.1 |
| | ≥ 30 | 88 | 22.9 |
| Women's educational level | No Education | 15 | 3.9 |
| | Primary | 182 | 47.4 |
| | Post Primary | 187 | 48.7 |
| Religion | Anglican | 57 | 14.8 |
| | Moslem | 130 | 33.9 |
| | Catholic | 121 | 31.5 |
| | Others (Pentecostals and SDA) | 76 | 19.8 |
| Marital status | Married | 309 | 80.5 |
| | Single | 75 | 19.5 |
| Women employment status | Un employed | 175 | 45.6 |
| | Employed | 209 | 54.4 |
| Parity | 1–3 | 207 | 53.9 |
| | > 3 | 177 | 46.1 |
| Household monthly income (UGSH) | < 100,000 | 94 | 24.5 |
| | ≥ 100,000 | 290 | 75.5 |

## Results

The study enrolled 384 participants who had delivered their recent child within the two years prior to data collection. The majority (296/384; 77.1%) were young women (18–29 years). Almost all participants were formally educated, with 182 (47.4%) having primary education and 187 (48.7%) having secondary education. In addition, 309 (80.5%) were married, and 209 (54.4%) were employed. These background characteristics of the respondents are given in Table 1.

### Proportion of deliveries in the health facilities

The prevalence of health facility-based delivery was 78.1% (95% CI: 73.1–82.2) in the urban slum settlement of the Lubaga Division. The majority (224, 74.7%) of the health facility deliveries had taken place in public/government-owned health facilities, as shown in Table 2.

**Table 2** Description of the deliveries of the health facilities

| Variable description | Category | Frequency | Percentage |
|---|---|---|---|
| **Delivered in a health facility** | Yes | 300 | 78.1 |
| | No | 84 | 21.9 |
| Type of health facility ($n = 300$) | Public health facility | 224 | 74.7 |
| | Private health facility | 76 | 25.3 |

### Factors associated with deliveries in health facilities

In bivariate level analysis, a woman's predispositions were age, religion, education level, and employment status; enablers/barriers included partner's employment status, family income level, partner's education, proximity to the health facility, waiting time at the health facility, availability and attitudes of health workers (HWs); and need factors, included parity and ANC visits, were significantly associated with delivery at a health facility.

According to the multivariate analysis, women's predispositions; age and education status, were positively associated with delivery in health facilities. For example, women below 30 years were 3.5times more likely to deliver in health facilities than women who were older (aOR = 3.5 95% CI: (1.06–4.36; $p = 0.039$). Furthermore, women who had a post-primary education level were 2.1 times more likely to deliver in a health facility than women who had no formal education (aOR = 2.1 95% CI: (1.03 – 5.87; $p = 0.001$). Similarly, women whose partners had post-primary or primary education were 18.5 and 14.1 times respectively more likely to deliver in a health facility than women whose partners had no formal education (aOR = 18.5 95% CI: (6.43-53-54; p = < 0.001) (aOR = 14.1 95% CI: (1.93-103.45; $p = 0.009$) respectively.

With respect to enabling factors, women who attended more than four antenatal visits were 24 times more likely to deliver in a health facility than those who attended less than four antenatal visits (aOR = 24.1 95% CI: (3.59-161.29);$p = 0.001$).Furthermore, women who were employed were 2.9 times more likely to deliver in a health facility than women who were unemployed (aOR = 2.9 95% CI: (1.19–7.49; $p = 0.020$).Women who reported the availability of health workers at the health facility were 35times more likely to deliver in a health facility than women who reported absence of health workers (aOR = 35.2 95% CI: (5.87-194-61);p = < 0.001). Regarding parity, women who had 1–3 children were 272 times more likely to deliver in a health facility than women who had more than 4 children, (aOR = 272 95% CI: (42.88-1725.41; p = < 0.001). Women who reported a waiting time of less than one hour at the health facility were 180 times more likely to deliver in a health facility than those who had a waiting time of more than one hour (aOR = 180.9 95% CI: (7.54–434.1; $p = 0.001$).Women who reported a positive attitude of health workers were 6.9 times more likely to deliver in a health facility than those who reported a negative attitude of health workers (aOR = 6.9 95% CI: (1.55–30.53; $p = 0.011$). On the other hand, a distance of 2–5 km (further than 2 km) (aOR = 0.1 95% CI: (0.01–0.12; $p = 0.001$) and a family income of less than 100,000ugx. (aOR = 0.2 95% CI: (0.01–0.98); $p = 0.001$), were negatively associated with health facility delivery. This information is displayed in Table 3.

## Discussion

The majority of women, 300 out of 384, (78.1%) delivered in the health facilities. The key factors associated with health facility delivery included predisposing factors; parity of 1–3, enablers; waiting time of less than one hour at the health facility, health worker availability, more than four antenatal visits, partner's post-primary education, positive attitude of health workers and maternal age of below 30years.

In this study 84 out of 384 (21.9%) of women delivered outside the health facility, and this occurred in the milieu of urban settings, which have more health facilities, better accessible transportation, and higher-quality services, where one would expect women to deliver from the health facility [13, 14, 27, 28, 35]. Similar findings were reported in the Uganda Demographic Survey of 2022 and elsewhere in the country and sub-Saharan countries [16, 24, 29, 43]. Although this depicts a better picture than a similar setting in Ethiopia, where 68.7% of women delivered outside a health facility, below the world health organization and UNICEF 2020–2025 recommended a national coverage target of more than 80% women attended by a skilled birth attendant [13, 17].

The study findings indicate that a positive attitude of health workers is associated with health facility-based delivery. Women reported that they felt cared for, valued, and respected as individuals; health workers demonstrated empathy, compassion, and friendliness towards them.

This finding is consistent with a study reporting that positive attitudes of health workers contributed to increased health facility-based deliveries [21]. Women develop good healthy relationships with health workers, and women also feel safer at health facilities where they are treated well and health workers are welcoming.

The waiting time at the health facility is significantly associated with mothers delivering in the health facility. Mothers who wait less than one hour to obtain services are more likely to utilize a HFD because they receive timely services and are motivated to seek services next time.

The evaluated need for health care influences the decision for individual health services [44]. The evaluated health need influences the decision of individuals to access and utilize health care services, as expressed by the fact that the frequency of ANC was positively associated with health facility delivery, which is similar to the findings of other studies [40, 41]. This could be because ANC services provide opportunities for women to obtain information on the status of pregnancy with probable risks involved.

The study findings indicate that women whose partners had a post-primary education level were 19 times more likely to deliver in a health facility than women

**Table 3** Factors independently associated with HFD among women in the Lubaga Division

| Variable Independent | Delivered in health facility | | UOR (CI at 95%) | *P* value | AOR (CI at 95%) | *P* value |
|---|---|---|---|---|---|---|
| | No (%) | Yes (%) | | | | |
| **Age of women** | | | | | | |
| 20–29 | 37 (44.1) | 259 (86.3%) | 8.02 (4.07–13.80) | **< 0.001** | 3.5 (1.06–4.36) | **0.039*** |
| ≥ 30 years | 47 (56.1) | 41 (13.7%) | 1.0 | | 1.0 | |
| **Religion** | | | | | | |
| Anglican | 25 (29.8%) | 32 (10.7%) | 0.29 (0.13–0.63) | **0.002** | 0.9 (0.25–2.96) | 0.814 |
| Catholic | 16(19.1%) | 105 (35.0%) | 1.48 (0.65–3.24) | 0.325 | 1.9 (0.88–4.18) | 0.100 |
| Moslem | 29 (34.5%) | 101 (33.7%) | 0.79 (0.39–1.60) | 0.508 | 1.1 (0.34–2.94) | 0.998 |
| Others | 14 (16.7%) | 62 (20.7%) | 1.0 | 1.0 | 1.0 | |
| **Woman's education** | | | | | | |
| No formal education | 9(10.3%) | 6 (2.0%) | 0.31 (0.11–0.92) | **0.034** | 0.2(0.01–2.43) | 0.190 |
| Post Primary | 17(20.1%) | 170 (56.3%) | 4.68 (2.60–8.42) | **< 0.001** | 2.1(1.03 – 5.87) | **0.001*** |
| Primary | 58(69.6%) | 124 (41.3%) | 1.0 | | 1.0 | |
| **Partner's education** | | | | | | |
| Post primary | 24(28.6%) | 200(66.7%) | 1.67(0.35–8.06) | 0.525 | 18.5(6.43-53-54) | **< 0.001*** |
| Primary | 58(69.0%) | 90 (30.0%) | 0.31(0.07–1.47) | 0.140 | 14.1(1.93-103.45) | **0.009*** |
| No formal education | 2(2.4%) | 10 (3.3%) | 1.0 | | 1.0 | |
| **Woman's employment** | | | | | | |
| Employed | 30 (35.7%) | 179(59.7%) | | | 2.9(1.19–7.49) | **0.020*** |
| Not employed | 54(64.3%) | 121(40.3%) | 0.38(0.23–0.62) | **< 0.001** | | |
| **Partner's employment** | | | | | | |
| Employed | 73(19.0%) | 292(76.0%) | 5.5(2.14–14.17) | **< 0.001** | 3.0(0.24–36.44) | 0.396 |
| Unemployed | 11(2.9%) | 8(2.1%) | 1.0 | | 1.0 | |
| **Parity** | | | | | | |
| 1–3 | 2(2.4%) | 205(68.3%) | 1.0 | **< 0.001** | 272(42.88-1725.41) | **< 0.001*** |
| > 3 | 82(97.6%) | 95(2.4%) | 0.01(0.003–0.047) | **< 0.001** | 1.0 | |
| **Proximity to a HF** | | | | | | |
| 2–5 km distance | 52 (61.9%) | 128(42.7%) | 0.46(0.28–0.75) | **0.002** | 0.1(0.01–0.12) | **0.001*** |
| < 2 km distance | 32 (38.1%) | 172(57.3%) | 1.0 | | 1.0 | |
| **Family monthly income (UGX)** | | | | | | |
| < 100,000 | 30(34.7%) | 64(21.3%) | | | 0.2(0.01–0.98) | **0.001*** |
| ≥ 100,000 | 54(64.3%) | 236(78.7%) | 2.05(1.21–3.46) | **0.007** | 1.0 | |
| **HWs availability** | | | | | | |
| Yes | 9(10.7) | 287(95.7%) | 97(75.77–446.70) | **< 0.001*** | 35.2(5.87-194-61) | **0.001*** |
| No | 75(89.3%) | 13(4.3%) | 1.0 | | 1.0 | |
| **ANC visits** | | | | | | |
| ≥ 4 ANC visits | 32 (38.1%) | 248(82.7%) | 7.75(4.55–13.20) | **< 0.001*** | 24.1(3.59-161.29) | **0.001*** |
| 1–3 ANC visits | 52(61.9%) | 52(17.3%) | 1.0 | | 1.0 | |
| **Waiting time at facility** | | | | | | |
| ≤ 1 h | 32(38.1%) | 264(88.0%) | 11.92(6.80-20.89) | **< 0.001*** | 180.9(7.54–434.1) | **0.001*** |
| > 1 h | 52(61.9%) | 36(12.0%) | 1.0 | | 1.0 | |
| **Positive attitude of HW** | | | | | | |
| Yes | 34(40.5%) | 264(88.0%) | 10.78(6.17–18.84) | **< 0.001*** | 6.9(1.55–30.53) | **0.011*** |
| No | 76(59.5%) | 10(12.0%) | 1.0 | | 1.0 | |

Source: Field data 2023* statistically significant factor

whose partners did not have an education level. Similarly, women who had a post primary education were 2 times more likely to deliver in health facilities than women did not have an education level. This finding is similar to those of other studies in developing countries [15, 44, 45], which all indicate that husbands' educational status plays a significant role in timely health care seeking and the economic capabilities required to access and utilize health-based delivery. Furthermore, the education of a woman is a determinant of health facility delivery. This could imply that education makes mothers more concerned with their health and more autonomous, and their ability and freedom to make decisions about their own health more favorable. Additionally, a high educational

level may lead to better health awareness with improved health literacy. In this study, younger women were more likely to utilize a HFD than older women were. The possible explanations could be that, compared with older women, younger women are more likely to use health services, probably because of their health-seeking behavior [37, 38], and they evaluate the need for health service use through having information about the benefits of delivery in health facilities [44]. On the other hand, older women may consider that giving birth at home is not risky, as they have previously experienced birth at home. This finding is also consistent with primary studies conducted in Nepal and three districts of Tanzania [46].

Maternal occupation as an enabling factor was statistically associated with mothers delivering in health facilities. This could be because women can afford the entire process, including transport and the required sundries during labor and childbirth. This finding is similar to those of studies conducted in Ethiopia [18, 20] and Papua New Guinea [43], which reported that although health facility deliveries were low, income status increased the chances of delivery from a health facility. It is possible that wealthier households are able to provide women with the financial resources needed to access health facility-based deliveries. Barriers like transport fares and user fees are eliminated. Additionally, the availability of health workers at health facilities is significantly associated with mothers delivering at health facilities. The possible reason for this could be that mothers are assured that of receiving services and that the availability of health workers at health facilities also eliminates unnecessary delays in obtaining services, which motivates mothers to seek and utilize skilled birth attendance services.

However, proximity to a health facility and a low family income were negatively associated with delivery in health facilities. Women further from a health facility were less likely to have a HFD than were closer [20]. This study revealed that despite availability of many health facilities within proximity to the urban slums of the Lubaga division, the high population densities of low-income and under-served residents, pause a high risk of poor maternal/neonatal health outcomes, therefore, women are exposed to high rates of home delivery due to persistent barriers of cost, poor service quality, and cultural norms.

### Strengths and limitations of the study

The strength of this study lies in the fact that data were collected directly from the community, within the participants' natural environment, which provides evidence needed for health planning, resource allocation and program design. In addition, a cross-sectional study design has strengths in describing the study population characteristics, measuring the prevalence of a targeted health outcome and identifying the determinants of the studied health outcome with data collected at a single point in time [30, 31]. Furthermore, the design is cost-effective, time saving and therefore suitable where there are limited time and financial constraints.

However, the study has some limitations. First, the reliance on self-reports on self-reported data may introduce response bias through underreporting or over reporting of some information. Secondly, there could have been selection bias since parishes were purposively selected. Thirdly, the cross-sectional design with data collected at only one point limits the ability to make causal inferences. Finally, since the study was conducted among slum settlers from one city, it may not be generalizable to other urban centres.

## Conclusions

The majority 300 out of the 384 (78.1%) women in Lubaga Division delivered at health facilities while 84 out of 384 (21.9%) delivered outside health facilities. The key factors associated with health facility-based delivery in the Lubaga Division from the study findings included; parity, waiting time at the health facility, availability of health workers, ≥4ANC visits, maternal and partner education level, attitudes of health workers, maternal occupation and age at births. Multiple targeted interventions like economic empowerment through education, financial assistance programs and addressing the health facility-related barriers like investing in quality of care through infrastructure improvements could help improve health facility deliveries in Lubaga Division and other similar settings.

#### Abbreviations

| | |
|---|---|
| ANC | Antenatal Care |
| APH | Antepartum Hemorrhage |
| FBD | Facility-Based Deliver |
| ICF | Inner City Fund-International |
| KCCA | Kampala Capital City Authority |
| MCH | Maternal and Child Healthcare |
| MHS | Maternal Health Services |
| MMR | Maternal Mortality Rate |
| PPH | Post-Partum Hemorrhage |
| RDC | Resident District Commissioner |
| SBA | Skilled Based Attendance |
| SDG | Sustainable Development Goals |
| TBA | Traditional Birth Attendant |
| UDHS | Uganda Demographic Health Survey |
| UN | United Nations |
| UNFPA | United Nations Population Fund |
| UNICEF | United Nations Children Emergency Fund |
| USAID | United States Agency for International Development |
| WHO | World Health Organization |

## Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12913-026-14445-x.

Supplementary Material 1

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**Author contributions**
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**Data availability**
The materials used for this research are available from the corresponding author on reasonable request.

## Declarations

**Ethics and consent**
The study involved human subjects and was approved by Uganda Martyrs University Research and Ethics Committee. Ethical approval was obtained from the Kampala Capital City Authority (KCCA) Research Ethics Committee, KCCA-REC (Ref: LUB/KCCA/005/09) based on the National Guidelines for Research Involving Human Participants in Uganda. Administrative permission to conduct the study was obtained from the Town Clerk Lubaga Division and from the chairpersons of the local councils. All the participants provided their written informed consent to participate in this study and further confirmed by imprinting thumb prints on the consent form.

**Consent for publication**
All authors reviewed the manuscript and consent for publication.

**Competing interests**
The authors declare no competing interests.

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