

HPV vaccine uptake and barriers among adolescent girls and young women living in the urban slums of Kampala, Uganda

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Abstract

Background

A high incidence of cervical cancer is evident in several low-income countries, particularly in the urban slums that harbor densely populated poor communities. Even though Human papillomavirus (HPV) vaccination is a key strategy for cervical cancer, the uptake remains low in these settings. This study assessed HPV vaccine uptake and barriers among adolescent girls and young women (AGYW) in the urban slums of Kampala, Uganda.

Methods

A cross-sectional mixed-methods study was conducted among 290 AGYW aged 15–24 years. Stratified random sampling was used to recruit participants between August and October 2025. Quantitative data were collected using a semi-structured questionnaire and analyzed with descriptive statistics and multivariable logistic regression in Stata 16.0. Qualitative data from focus group discussions were analyzed using thematic analysis.

Results

Of 290 AGYW (mean age 19.76 years, SD = 3.00), 30.7% reported receiving the HPV vaccine, and only 19.0% had completed the two-dose schedule. The most commonly reported barriers to vaccination were lack of awareness, fear of side effects, and limited access to vaccination services. Proximity to a vaccination clinic (aOR 0.53; 95% CI: 0.30–0.93) and healthcare worker counselling (aOR 0.27; 95% CI: 0.15–0.47) were each associated with significantly lower odds of remaining unvaccinated. Qualitative findings highlighted limited knowledge and misconceptions about HPV and the vaccine, parental influence on vaccination decisions, and health system barriers such as poor communication, inconsistent service availability, and negative healthcare experiences. Structural challenges, including distance to vaccination sites and transport limitations, further constrained access to HPV vaccination.

Conclusion

HPV vaccine uptake among AGYW in Kampala's urban slums remains low due to low awareness, misconceptions, parental influence, and health system and structural barriers. Strengthening community sensitization, improving healthcare worker communication, and expanding community- and school-based delivery are critical to improving equitable vaccine access and uptake

Trial registration:

Not applicable

Introduction

Cervical cancer is the fourth most common cancer among women worldwide, with approximately 660,000 new cases and 350,000 deaths reported in 2022. The highest incidence and mortality rates occur in low- and middle-income countries (LMICs), with Sub-Saharan Africa (SSA) bearing the greatest burden globally. This disproportionate burden is largely attributed to low cervical cancer screening coverage, limited access to national human papillomavirus (HPV) vaccination programs, and inadequate cervical cancer treatment services(1, 2). Cervical cancer is the leading cause of cancer-related death among women in 21 of the 48 countries in SSA, including Uganda, where incidence rates are approximately three times higher than the global average, and an estimated 4,607 of the 6,959 women diagnosed annually die from the disease(2–4). Slums harbor densely populated and socioeconomically disadvantaged populations, contributing to elevated disease rates; a high incidence of cervical cancer has been reported in several low-income slums in Kampala, including Naguru, Kinawataka, Kiswa, and Kalerwe(5).

In Uganda, over 13.1 million women aged 15 years and older are at risk of developing cervical cancer. Approximately 3.6% of women in the general population are estimated to harbor high-risk HPV-16/18 infection at any given time, and these genotypes account for 57.0% of invasive cervical cancers(4). HPV vaccines are highly effective, preventing 70%–90% of HPV-related cancers, with safety and efficacy demonstrated through randomized trials and post-marketing studies(6). Despite ongoing global efforts to prevent HPV-related morbidity and mortality, HPV vaccine uptake remains unacceptably low in developing regions, particularly in SSA, where the pooled prevalence of HPV vaccination in East Africa is estimated at 35%(7, 8).

HPV vaccination was introduced in Uganda in 2015 and integrated as a two-dose schedule into the Uganda National Expanded Programme on Immunization (UNEPI). Despite this integration, HPV vaccine uptake has remained unacceptably low, with many eligible girls failing to complete the second dose(9). Only 8.6% of adolescent girls in Kampala had completed the HPV vaccine schedule of two doses (10). According to the Uganda National Immunization Strategy (NIS) 2024–2028, the HPV vaccination schedule has been updated from a two-dose regimen to a single-dose schedule for girls aged 10 years, while a two-dose schedule is maintained for immunocompromised girls(11, 12).

The low uptake of HPV vaccinations is a complex issue. Several predictors, including low vaccine knowledge, fear of pain, side effects, immunization history, ethnicity, age, sexual behavior, and school attendance status, can partially explain it. In addition, some parents' beliefs that the vaccine might encourage promiscuity, cause young girls to become sexually active at an earlier age, or result in unsafe sexual behavior are barriers to the uptake of HPV vaccinations(9).

Despite the high burden of cervical cancer and persistently low HPV vaccine coverage, limited research has examined the unique barriers to HPV vaccination among adolescent girls and young women (AGYW)

living in urban informal settlements in Kampala. This study aimed to address this gap by assessing HPV vaccine uptake and exploring the barriers to vaccination among AGYW residing in Kampala's urban slums.

Methods

Study Design

We conducted a cross-sectional mixed-methods study. Data were collected between August and October 2025.

Study setting

The study was carried out in the different urban slums across the five administrative divisions of Kampala, i.e., Kampala Central, Kawempe, Nakawa, Makindye, and Rubaga. There are 57 slums or informal settlements within these divisions(13). One slum was selected purposively from each division. The selected slums included: Katanga in Kawempe division, Kisenyi in Central division, Namuwongo in Makindye division, Bukoto Mulimira in Nakawa division, and Bakuli in Rubaga division.

Study Population

The study population comprised AGYW aged 15 to 24 years living in urban slums in Kampala, Uganda, who were present at the study site during the study period and consented to participate in the study.

Sampling Technique

Quantitative: stratified random sampling was used to select participants. Each selected slum from each of the divisions represented a stratum. An equal number of AGYW was selected from each slum. With the support of local leaders and community health workers, a listing of households with eligible AGYW was made. Households were then selected using simple random sampling. Where more than one eligible AGYW was found in a household, one participant was selected by simple random selection to avoid clustering at the household level.

Qualitative: participants were selected through purposive sampling, ensuring representation across age, marital status, and HPV vaccination status to enrich the discussion.

Sample Size Estimation

Quantitative: The sample size was 290 AGYW, calculated using Kish and Leslie's formula, based on a confidence level of 95% and a 5% margin of error with a 10% non-response rate. The estimated prevalence of 22% for uptake of both HPV doses was adapted from a previous study on Human

Papillomavirus Vaccination Uptake and its Predictors Among Female Adolescents in Gulu Municipality, Northern Uganda(9).

Qualitative: Five focus group discussions were conducted, with one FGD held in each selected slum. Each FGD comprised 12 purposively selected participants, in line with accepted standards for FGD sample sizes(14).

Selection Criteria

Inclusion Criteria

AGYW aged 15–24 years who had stayed in the urban slums for at least six months and were able to provide informed consent (or assent for minors with parent or guardian consent).

Exclusion Criteria

all AGYW with medical or psychological conditions such as severe cognitive impairment or acute psychiatric illness that impaired their ability to participate meaningfully in the study.

Data Collection Procedures

Quantitative data were collected through semi-structured researcher-administered questionnaires (Supplementary File 1), covering socio-demographics, uptake of both doses of the HPV vaccine, and the different barriers to HPV vaccine uptake among AGYW in the urban slums of Kampala. The questionnaire was administered in both English and Luganda. The tool was first developed in English, translated into Luganda, and reviewed for consistency. It was pretested among AGYW in Kamwokya slum, and minor revisions were made to improve clarity, wording, and sequencing of questions.

Qualitative data were obtained through a focus group discussion (Supplementary File 2) led by a trained facilitator using a discussion guide. The discussions were conducted in both English and Luganda, audio-recorded with participants' consent, and later transcribed for analysis.

Study Variables

Quantitative: the dependent variable was HPV vaccination uptake status among the AGYW. The independent variables included demographics (age, religion, marital status, monthly income, educational level, and school attendance status), cultural beliefs, and health service access-related factors like distance to vaccination clinic.

Qualitative: the key areas of inquiry included knowledge about HPV and cervical cancer, vaccine accessibility, awareness, and attitudes towards the HPV vaccine.

Data Analysis

Quantitative data were entered in Excel 2019 and analysed in Stata v16.0. Descriptive statistics (frequencies and proportions, means, and standard deviations) were generated. Bivariate logistic regression identified variables associated with outcomes; those with $p < 0.2$ were carried into the multivariable model. Crude odds ratios and adjusted odds ratios with 95% confidence intervals were reported. Variables significant at $p < 0.05$ were selected as independent predictors.

Qualitative: audio recordings from the focus group discussions were transcribed verbatim, then imported into ATLAS. Ti (version 25) to facilitate thematic content analysis. Researchers coded meaningful data segments into initial codes, grouped related codes into broader themes, and refined them iteratively using ATLAS. Emerging themes were defined and illustrated using direct participant quotes.

Ethical Consideration

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The Makerere University School of Health Sciences Research Ethics Committee (MAKSHSREC: 2024 – 849) reviewed and approved the study. The study was also registered and approved by the Uganda National Council for Science and Technology (UNCST), HS6259ES. Permission to conduct the study within the selected communities was also obtained from relevant local authorities. Written informed consent was obtained from all participants, with assent and guardian consent for those aged 15–17. Participant confidentiality was protected using identification numbers rather than names, and consent forms were stored separately from data. All participants were fully informed of the study's purpose, potential risks and benefits, and their right to withdraw at any time without penalty.

Results

Quantitative

Socio-demographics

290 young people consented and completed the survey, yielding a response rate of 100%. The mean age was 19.76 years (SD = 3.00). Most AGYW were not enrolled in school (67.9%), 53.4% had attained secondary education. 73.8% identified as Christian, and over half were living with a guardian or other non-biological caretaker (57.6%). The majority had never been married (73.1%) and lived in households with fewer than five members (56.2%). Most AGYW reported a household income above 100,000-500,000 UGX (60.0%) and resided within 10 km of a health facility (99.0%) (Table 1).

Table 1
Socio-demographic characteristics of adolescent girls and young women in the urban slums of Kampala.

Variable	Frequency (n = 290)	Percentage (%)
Age	Mean (SD) =	19.76 (3.00)
Enrolled in school		
Yes	93	32.1
No	197	67.9
Level of Education		
No formal education	4	1.4
Primary education	112	38.6
Secondary education	155	53.4
Tertiary education	19	6.6
Religion		
Muslim	76	26.2
Christian	214	73.8
Primary caretaker		
Biological parent	123	42.4
Guardian / Other	167	57.6
Marital Status		
Never married	212	73.1
Ever been Married	78	26.9
Household Size		
< 5 members	163	56.2
≥ 5 members	127	43.8
Level of Income		
< 100,000	67	23.1
100,000-500,000	174	60.0
500,000–1,000,000	34	11.7
Above 1,000,000	15	5.2

<i>Variable</i>	<i>Frequency (n = 290)</i>	<i>Percentage (%)</i>
Distance to health facility		
<i>Near (< 10km)</i>	287	99.0
<i>Far (> 10km)</i>	3	1.0

HPV vaccine uptake

Overall, 30.7% of AGYW reported receiving the HPV vaccine; among those vaccinated, 61.8% reported completing the two-dose schedule, corresponding to approximately 19.0% of AGYW being fully vaccinated (Fig. 1).

Barriers to HPV vaccine uptake

Among AGYW who reported not vaccinated ($n = 201$), the most frequently self-reported barrier was lack of awareness of the HPV vaccine ($n = 94$), followed by fear of side effects ($n = 49$) and other reasons ($n = 51$), such as limited awareness and misinformation about the HPV vaccine and its benefits, lack of knowledge regarding where vaccination services could be accessed, and limited availability or accessibility of vaccination services (Fig. 2).

Participants who reported having a vaccination clinic near their home had 47% lower odds of remaining unvaccinated compared to those without nearby services (aOR 0.53; 95% CI: 0.30–0.93; $p = 0.026$). Similarly, participants who had been informed about the HPV vaccine by a healthcare worker had 73% lower odds of remaining unvaccinated compared to those who had not received such information (aOR 0.27; 95% CI: 0.15–0.47; $p < 0.001$). Other factors, including school attendance, education level, marital status, household size, living arrangements, and perceived risk of HPV infection, were not significantly associated with vaccine uptake (Table 2).

Table 2

Factors associated with HPV vaccine non-uptake among adolescent girls and young women in urban slums of Kampala OR: Odds ratio; aOR: Adjusted odds ratio; cOR: crude odds ratio; CI: Confidence interval; Ref: reference category. HCW: Healthcare worker; HPV: Human Papillomavirus

Variable	HPV vaccine uptake		cOR (95% CI)	p-value	aOR (95% CI)	p-value
	n (%)					
	Yes	No				
School attendance						
Yes (Ref)	36(38.7)	57(61.3)	0.61(0.36–1.03)	0.066	0.89(0.48–1.69)	0.573
No	55(27.9)	142(72.1)	Ref	-	Ref	-
Level of education						
Low (Primary and never educated) (Ref)	36(31.0)	80(69.0)	Ref	-	Ref	-
High (Tertiary and Secondary)	55(31.6)	119(68.4)	0.97(0.59–1.62)	0.918	-	-
Relationship status						
Ever been married (Ref)	19(24.4)	59(75.6)	Ref	-	Ref	-
Never been married	72(34.0)	149(66.0)	1.60(0.89–2.88)	0.120	1.67(0.82–3.40)	0.158
Staying with Parent						
No (Ref)	47(28.1)	120(71.9)	Ref	-	Ref	-
Yes	44(35.8)	79(64.2)	0.70(0.43–1.15)	0.167	0.85(0.46–1.59)	0.326
Household size						
< 5 (Ref)	49(30.1)	114(69.9)	Ref	-	Ref	-
≥ 5 (Ref)	42(33.1)	85(66.9)	0.87(0.53–1.43)	0.584	-	-
Perceive risk of HPV						
No/Not sure (Ref)	65(32.5)	135(67.5)	Ref	-	Ref	-
Yes	26(28.9)	64(71.1)	1.19(0.69–2.04)	0.540	-	-
Vaccination clinic near home						

Variable	HPV vaccine uptake		cOR (95% CI)	p-value	aOR (95% CI)	p-value
	n (%)					
	Yes	No				
School attendance						
No (Ref)	35(22.3)	122(77.7)	Ref	-	Ref	-
Yes	56(42.1)	77(57.9)	0.39(0.24–0.66)	0.000	0.53(0.30–0.93)	0.026
Informed by HCW about the HPV vaccine						
No (Ref)	27(17.4)	128(82.6)	Ref	-	Ref	-
Yes	64(47.4)	71(52.6)	0.23(0.14–0.40)	0.000	0.27(0.15–0.47)	0.000

Qualitative

The focus group discussion identified four key themes: limited knowledge and misconceptions about HPV and the HPV vaccine; social and parental influences on vaccination decisions; health system and service delivery barriers; and structural and logistical barriers to vaccine access.

Theme one: Limited knowledge and misconceptions about cervical cancer and the HPV vaccine.

AGYW showed limited awareness and understanding of cervical cancer and the HPV vaccine. Many reported that they had never heard of cervical cancer, while others only had partial knowledge about the disease, its causes, and prevention.

“We are hearing about cervical cancer and HPV for the first time.” FGD 1.

Even among those who had heard about HPV, many did not understand how it is transmitted.

“We have heard about HPV, but we don’t know how it is transmitted.” FGD 1.

Misconceptions also existed about the HPV vaccine, with some participants believing it could cause infertility or serious illness. These knowledge gaps and misconceptions fuelled uncertainty and hesitancy toward HPV vaccination.

“They say the vaccine can burn your ovaries and you become infertile.” FGD 3.

Theme Two: Social and Parental Influences on Vaccination Decisions

Parental influence emerged as a key determinant of HPV vaccine uptake, particularly among adolescent girls who required parental consent before receiving the vaccine. Several participants reported that parents sometimes refused vaccination due to fears about vaccine safety or lack of information.

"My mother refused to let me get vaccinated." FGD 2.

Similarly, participants indicated that some girls were unable to receive the vaccine in school because their parents did not grant consent.

"Some pupils refused because their parents refused to get them vaccinated." FGD 5.

. Community perceptions and rumours about the vaccine also influenced parental decisions, further contributing to vaccine hesitancy

Theme three: Health System and Service Delivery Barriers

AGYW described several barriers to health system service delivery that hindered access to HPV vaccination, including poor communication about vaccination campaigns, inconsistent service availability, and negative experiences with healthcare providers. They reported that vaccination campaigns were often carried out with little prior sensitization or clear information about where and when vaccination services were available.

"They did not mobilise or campaign well. We just heard that they had finished vaccinating." FGD 2.

Some reported visiting health facilities for vaccination but found healthcare workers unavailable or services closed, while others felt stigmatized or neglected by healthcare providers, discouraging them from seeking care.

"When I went to the hospital to get vaccinated, I didn't find the healthcare worker there." FGD 4.

"Because we live and come from a slum, most times when we go to the hospital, we are misjudged and overlooked." FGD 1.

Theme four: Structural and Logistical Barriers to Vaccine Access

Participants also reported structural barriers that limited their ability to access HPV vaccination services. These included distance to vaccination sites and lack of transport. Several participants stated that vaccination services were often located far from their communities, making them difficult to access.

"If you told me they were vaccinating from a far place, chances are high I won't go there." FGD 5.

"If vaccination is within the community, it is easy to go and get vaccinated, because sometimes we don't have transport." FGD 5.

Discussion

This study explored the uptake and barriers to the HPV vaccine among AGYW in the urban slums of Kampala. The results show that HPV vaccine uptake remains low, with only a small percentage receiving the second dose. Major barriers identified include limited awareness and knowledge about cervical cancer and the HPV vaccine, concerns over potential side effects, and a lack of information from healthcare workers about the vaccine. Social influences, especially parental refusal, also impacted vaccination decisions. Additionally, health system issues such as poor communication about vaccination campaigns, inconsistent service availability, and the absence of healthcare workers at clinics restricted access to vaccination. Structural barriers like distance to vaccination sites and transportation shortages further hampered HPV vaccine uptake among AGYW.

Although the HPV vaccination uptake among AGYW in Kampala's urban slums is comparable to previous Ugandan studies, it is still below the global targets of 90% and the stated national coverage of 99% for HPV-1.(15, 16). Previous studies conducted in Uganda have reported widely varying levels of HPV vaccine uptake. A study conducted among adolescent girls in Kampala reported 69.8% of girls completed 2 doses of the HPV vaccine(17); however, another study conducted in the same setting reported even lower completion rates, with only 8.6% of adolescent girls completing the two-dose schedule(10). In Gulu municipality, only 22% of adolescent girls had received the HPV vaccine, while only 10.6% of young women living in fishing communities in Wakiso and Mukono had received the vaccine(9, 16). These findings suggest that despite the introduction of HPV vaccination into Uganda's national immunization program, uptake remains inadequate in many communities, particularly among marginalized populations.

The lack of awareness about the HPV vaccine was the most frequently reported barrier among AGYW. This was consistent with findings in the Mbale district, where the lack of awareness about the HPV vaccine was the major reason for not being vaccinated among adolescent girls(18). Similarly, another study conducted among adolescent girls in Kampala reported that nearly half of the participants had low knowledge about HPV vaccination, which was associated with lower vaccination uptake(10).

HPV vaccine hesitancy has unique contributing factors, such as misconceptions about the vaccine's safety and efficacy, and cultural beliefs. AGYW had widespread misconceptions about the HPV vaccine, particularly concerns that the vaccine may cause infertility or serious health complications. Evidence from previous research suggests that misinformation circulating within communities can undermine trust in vaccination programs and discourage individuals from seeking vaccination services(19).

Parents' influence on the vaccination decisions of AGYW was another important barrier identified in this study; many reported that parental refusal prevented some girls from receiving the vaccine. Similarly, in Gulu municipality, it was found that parental factors were significantly associated with HPV vaccine uptake among adolescent girls(9). Health system factors also emerged as important determinants of vaccine uptake. Consistent with other studies, limited physical access to vaccination services,

exacerbated by long distances and transport challenges, reduces uptake by increasing indirect costs and the logistical burden on adolescents and their caregivers(20).

In addition, the lack of information about the HPV vaccine from healthcare workers significantly affects vaccine acceptance; evidence shows that the lack of clear information on vaccine benefits, safety, and schedules contributes to missed opportunities for vaccination(21). Poor communication regarding vaccination campaigns, inconsistent availability of vaccination services, and negative experiences with healthcare providers further compound these challenges. Similar studies across sub-Saharan Africa highlight that service delivery systems and negative healthcare experiences can discourage engagement with vaccination programs, ultimately limiting equitable access among vulnerable populations such as adolescents(21, 22).

These findings have important public health implications in light of Uganda's transition to a single-dose HPV vaccination schedule. Evidence indicates that a single dose provides protection comparable to multi-dose regimens, while simplifying delivery and improving coverage(23). This policy shift may help mitigate logistical constraints such as missed follow-up doses and access barriers identified in this study. However, persistent gaps in vaccine awareness, community engagement, and health system delivery must be addressed to ensure that the potential benefits of the single-dose strategy translate into improved and equitable vaccination uptake.

Strengths and limitations

This study addresses a locally relevant public health issue using a mixed-methods design, enhancing validity through triangulation. The study included multiple sites, increasing the local generalizability of findings. It maintained strong ethical standards. The real-world setting, engagement of local youth, and inclusion of a hard-to-reach population increase contextual relevance and policy applicability. The high response rate reduces the risk of non-response bias. The study, however, had a few limitations. First, the reliance on self-reported data may introduce bias, which may affect the accuracy of reported HPV vaccine uptake and related variables. Secondly, the cross-sectional nature of the study limits the ability to establish causality between identified factors and HPV vaccine uptake, as it only captures associations at a single point in time. This limits causal inference; longitudinal studies are needed to establish temporality.

Conclusion

HPV vaccine uptake among AGYW in urban slums in Kampala remains low and is influenced by a complex interplay of individual, social, and health system factors. Limited awareness, misconceptions, and parental influence continue to drive vaccine hesitancy, while structural and health system barriers constrain access to vaccination services. Addressing these challenges requires targeted, multi-level interventions, including strengthening community sensitization, engaging parents and caregivers, and

improving healthcare worker communication. In addition, expanding community-based and school-based vaccination strategies may improve access and coverage.

Abbreviations

AGYW

Adolescent girls and young women

aOR

Adjusted odds ratio

CI

Confidence interval

cOR

Crude odds ratio

FGD

Focus group discussion

HCW

Healthcare worker

HPV

Human papillomavirus

LMICs

Low- and middle-income countries

MAKSHSREC

Makerere University School of Health Sciences Research Ethics Committee

NIS

National Immunisation Strategy (Uganda)

RSTMH

Royal Society of Tropical Medicine and Hygiene

SSA

Sub-Saharan Africa

UNCST

Uganda National Council for Science and Technology

UNEPI

Uganda National Expanded Programme on Immunization

VHT

Village health team

Declarations

Competing Interests

Not Applicable

Author's contribution

MCS conceived the idea and wrote the paper with TO, NAM, MOO, JS, DK, RNK, VN, SBK, and RO. MCS, MOO, and TO participated in the data analysis; VN and RO guided the design of the approach, data collection, and analysis tools. All the authors reviewed the manuscript for intellectual content and approval of the final manuscript.

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Consent for Publication.

Not Applicable

Data availability statement

All data and materials related to the study are available upon reasonable request from the corresponding author.

Ethical Consideration

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The Makerere University School of Health Sciences Research Ethics Committee (MAKSHSREC: 2024 -849) reviewed and approved the study. The study was also registered and approved by the Uganda National Council for Science and Technology (UNCST), HS6259ES. Permission to conduct the study within the selected communities was also obtained from relevant local authorities. Written informed consent was obtained from all participants, with assent and guardian consent for those aged 15–17. Participant confidentiality was protected using identification numbers rather than names, and consent forms were stored separately from data. All participants were fully informed of the study's purpose, potential risks and benefits, and their right to withdraw at any time without penalty.

References

1. World Health Organization. WHO. Cervical cancer [Internet]. 2024 [cited 2024 Dec 2]. Available from: <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer>

2. Dzinamarira T, Moyo E, Dzobo M, Mbunge E, Murewanhema G. Cervical cancer in sub-Saharan Africa: an urgent call for improving accessibility and use of preventive services. *Int J Gynecologic Cancer*. 2023;33(4):592–7. 10.1136/ijgc-2022-003957.
3. Anumolu N, Lechleitner K, Patel N, Jankowski C, Anguzu R, Kasasa S, et al. Professional views on priorities for cervical cancer policy in Uganda: a qualitative study. *Lancet Glob Health*. 2022;10:S16. 10.1016/S2214-109X(22)00145-0.
4. ICO/IARC Information Centre on HPV and Cancer. Human Papillomavirus and Related Cancers, Fact Sheet 2023 [Internet]. 2023 [cited 2024 Dec 2]. Available from: https://hpvcentre.net/statistics/reports/UGA_FS.pdf
5. Beyer K, Kasasa S, Anguzu R, Lukande R, Namboozee S, Amulen PM, et al. High-resolution disease maps for cancer control in low-resource settings: A spatial analysis of cervical cancer incidence in Kampala, Uganda. *J Glob Health*. 2022;12:04032. 10.7189/jogh.12.04032.
6. Wang R, Pan W, Jin L, Huang W, Li Y, Wu D, et al. Human papillomavirus vaccine against cervical cancer: Opportunity and challenge. *Cancer Lett*. 2020;471:88–102. 10.1016/j.canlet.2019.11.039.
7. Asgedom YS, Kebede TM, Seifu BL, Mare KU, Asmare ZA, Asebe HA, et al. Human papillomavirus vaccination uptake and determinant factors among adolescent schoolgirls in sub-Saharan Africa: A systematic review and meta-analysis. *Hum Vaccin Immunother*. 2024;20(1). 10.1080/21645515.2024.2326295.
8. Agimas MC, Adugna DG, Derseh NM, Kassaw A, Kassie YT, Abate HK, et al. Uptake of human papilloma virus vaccine and its determinants among females in East Africa: a systematic review and meta-analysis. *BMC Public Health*. 2024;24(1):842. 10.1186/s12889-024-18141-5.
9. Aruho C, Mugambe S, Baluku JB, Taremwa IM. Human Papillomavirus Vaccination Uptake and Its Predictors Among Female Adolescents in Gulu Municipality, Northern Uganda. *Adolesc Health Med Ther*. 2022;13:77–91. 10.2147/AHMT.S383872.
10. Bitariho GK, Tuhebwe D, Tigaiza A, Nalugya A, Ssekamatte T, Kiwanuka SN. Knowledge, perceptions and uptake of human papilloma virus vaccine among adolescent girls in Kampala, Uganda; a mixed-methods school-based study. *BMC Pediatr*. 2023;23(1):368. 10.1186/s12887-023-04174-z.
11. Crawford EE, Ajayi TF, Ampeire I, Baganizi M, Chisema MN, Griffith BC, et al. Policies and strategies for HPV vaccination schedule completion in immunocompromised girls, including girls living with HIV: Qualitative insights from Eswatini, Malawi, and Uganda. *medRxiv*. 2025. 2025.05.06.25327127.
12. Ministry of Health U, Uganda National Expanded Programme on Immunisation (UNEPI). National Immunisation Strategy (NIS) 2024–2028. Kampala; 2024.
13. Magunda A, Ononge S, Balaba D, Waiswa P, Okello D, Kaula H, et al. Maternal and newborn healthcare utilization in Kampala urban slums: perspectives of women, their spouses, and healthcare providers. *BMC Pregnancy Childbirth*. 2023;23(1):321. 10.1186/s12884-023-05643-0.
14. Johnson R, Christensen L. Educational Research Quantitative, Qualitative, and Mixed Approaches Fifth Edition. [Internet]. 2014 [cited 2024 Dec 2]. Available from: 264274753_Educational_Research_Quantitative_Qualitative_and_Mixed_Approaches_Fifth_Edition.

15. WHO. Human papillomavirus and cancer [Internet]. 2024 [cited 2024 Dec 5]. Available from: <https://www.who.int/news-room/fact-sheets/detail/human-papilloma-virus-and-cancer>
16. Laban M, Nanyonjo G, Wambuzi M, Ssetaala A, Basalirwa G, Muramuzi D, et al. Uptake of Human Papilloma Virus vaccine among young women living in fishing communities in Wakiso and Mukono districts, Uganda. *PLOS Global Public Health*. 2024;4(4):e0003106. 10.1371/journal.pgph.0003106.
17. Patrick L, Bakeera-Kitaka S, Rujumba J, Malande OO. Encouraging improvement in HPV vaccination coverage among adolescent girls in Kampala, Uganda. *PLoS ONE*. 2022;17(6):e0269655. 10.1371/journal.pone.0269655.
18. Nabirye J, Babirye J, Andrew O, Johnbaptist W. Role of the health system in influencing uptake of human papillomavirus vaccine among adolescent girls in Mbale District, eastern Uganda: a cross-sectional, mixed-methods study. *Lancet Glob Health*. 2018;6:S8. 10.1016/S2214-109X(18)30137-2.
19. Kyei GK, Kyei EF, Ansong R. HPV Vaccine Hesitancy and Uptake: A Conceptual Analysis Using Rodgers' Evolutionary Approach. *J Adv Nurs*. 2024;81(5):2368. 10.1111/jan.16653 . PubMed PMID: 39651685.
20. Enyan NIE, Zhang M, Ken-Amoah S, King-Okoye M, Agyeiwaa J, Sarfo-Walters R, et al. Acceptance of HPV Vaccination: A Systematic Review of Knowledge, Attitudes and Barriers Among Healthcare Practitioners in Low- and Middle-Income Countries. *Biomed Res Int*. 2026;2026(1):9294978. 10.1155/bmri/9294978 . PubMed PMID: 41551329.
21. Nabirye J, Okwi LA, Nuwematsiko R, Kiwanuka G, Muneza F, Kamya C, et al. Health system factors influencing uptake of Human Papilloma Virus (HPV) vaccine among adolescent girls 9–15 years in Mbale District, Uganda. *BMC Public Health*. 2020;20(1). 10.1186/s12889-020-8302-. z PubMed PMID: 32019543.
22. Kutz JM, Rausche P, Gheit T, Puradiredja DI, Fusco D. Barriers and facilitators of HPV vaccination in sub-saharan Africa: a systematic review. *BMC Public Health* 2023 23:1. 2023;23(1):974-. 10.1186/s12889-023-15842-1 PubMed PMID: 37237329.
23. One-dose Human Papillomavirus. (HPV) vaccine offers solid protection against cervical cancer [Internet]. [cited 2026 Mar 18]. Available from: [https://www.who.int/news/item/11-04-2022-one-dose-human-papillomavirus-\(hvp\)-vaccine-offers-solid-protection-against-cervical-cancer](https://www.who.int/news/item/11-04-2022-one-dose-human-papillomavirus-(hvp)-vaccine-offers-solid-protection-against-cervical-cancer)

Figures

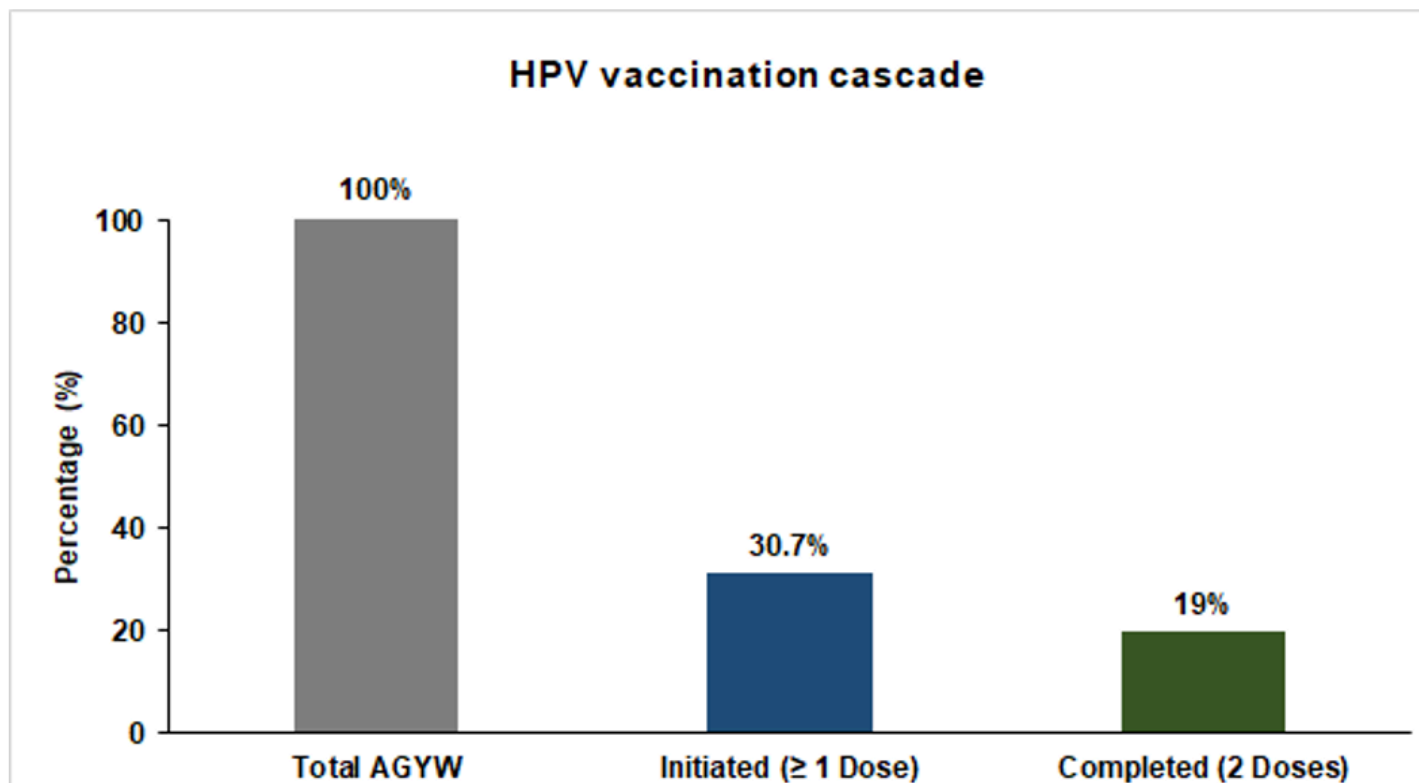


Figure 1

HPV vaccination cascade.

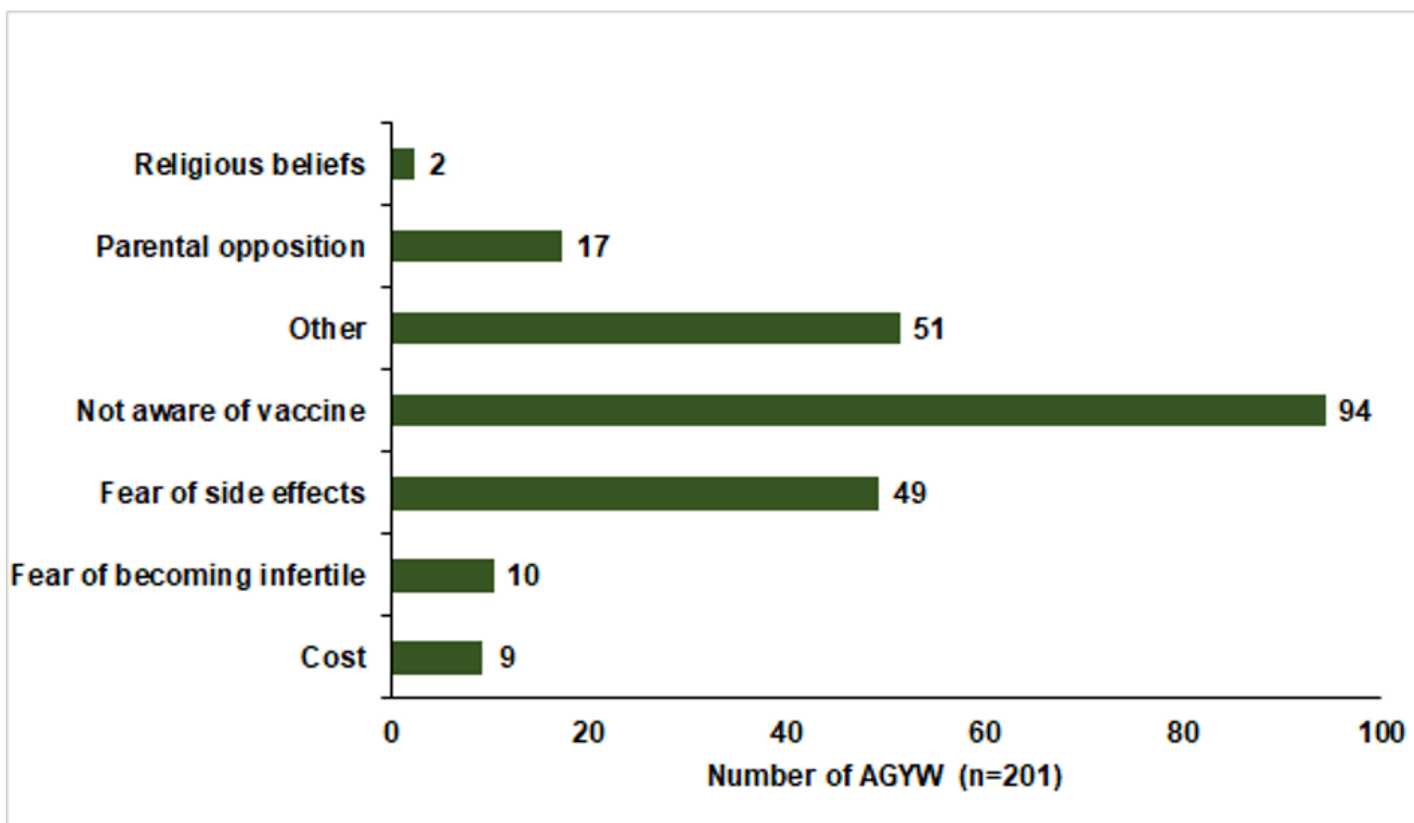


Figure 2

Self-reported barriers to HPV vaccination among AGYW in urban slums of Kampala.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementaryFile1Questionnaire.pdf](#)
- [SupplementaryFile2FGDGuide.pdf](#)