



# Determinants of the Uptake of Human Papillomavirus (HPV) Vaccine in Nigeria: A Systematic Review

<sup>1</sup>Eme Dominic Uyanga; <sup>2</sup>Best Ordinioha; <sup>3</sup>Vivian Ogbonna; <sup>4</sup>Daniel Okon & <sup>5</sup>Emmanuel Etim Clement

<sup>1</sup>University of Port Harcourt, Rivers State, Nigeria  
[uyangaeme06@gmail.com](mailto:uyangaeme06@gmail.com)/ [eme.uyanga@uniport.edu.ng](mailto:eme.uyanga@uniport.edu.ng)  
ORCID: 0009-0006-3884-1691  
<sup>2</sup>[best.ordinioha@uniport.edu.ng](mailto:best.ordinioha@uniport.edu.ng)  
<sup>3</sup>[vivian.ogbonna@uniport.edu.ng](mailto:vivian.ogbonna@uniport.edu.ng)

<sup>4</sup>Department of Cybersecurity, Faculty of Computing,  
University of Port Harcourt, Rivers State, Nigeria  
ORCID: 0009-0003-2986-2165

<sup>5</sup>National Agency for the Control of AIDS (NACA)  
[Emmanuel\\_clement@uniport.edu.ng](mailto:Emmanuel_clement@uniport.edu.ng)  
ORCID: 0000-0002-7877-9187

## ABSTRACT

Cervical cancer remains a leading public health challenge worldwide, with over 600,000 new cases and more than 350,000 deaths annually. In Nigeria, cervical cancer ranks as the second leading cause of cancer-related deaths among women. Despite the availability of the highly effective HPV vaccine, its uptake remains suboptimal and variable across different regions and populations within the country. This systematic review synthesizes evidence on the socio-cultural, health system/structural, and individual-level determinants of HPV vaccine uptake in Nigeria. This systematic review was conducted following the 2020 PRISMA guidelines. A comprehensive search was performed across four electronic databases, PubMed, ResearchGate, MDPI, and ScienceDirect. Initially, 45 records were identified, and after the removal of duplicates, 36 records were screened. Of these, 20 full-text articles were assessed for eligibility, and 12 met the inclusion criteria for synthesis. A narrative synthesis was employed due to heterogeneity in research populations and outcome measures. The uptake of the HPV vaccine in Nigeria ranged from 2.1% to 53.9%, with determinants identified across three levels: sociocultural, health system/structural, and individual. In Surulere, Lagos, employment (AOR = 60.45, 95% CI 10.63–343.46) and being unmarried (AOR = 33.33, 95% CI 12.50–100.00) were significantly associated with higher vaccine uptake. In Ibadan, Oyo State, knowledge about HPV was high (98.9%), but vaccine acceptance was hindered by perceived high costs and concerns about side effects. In Owerri, tertiary education among parents (OR = 2.25, 95% CI 1.28–4.02) was associated with increased vaccine acceptance. In

multi-state studies, higher vaccine uptake was linked to previous COVID-19 vaccination (aOR = 6.87, 95% CI 6.20–7.61) and exposure to HPV vaccine messaging. In Kaduna North, only 7.5% of adolescent girls received the vaccine, with uptake influenced by awareness and parental willingness.

Conclusion: Despite increased awareness of HPV and its association with cervical cancer, HPV vaccine uptake in Nigeria remains low and inconsistent. Key determinants such as knowledge, socio-cultural beliefs, healthcare accessibility, and parental influence significantly impact vaccine uptake. Addressing these barriers through targeted, multi-level interventions, including health system improvements, culturally sensitive messaging, and enhanced education, is crucial to improving vaccine coverage in Nigeria.

**Keywords:** Uptake of HPV Vaccine, HPV Vaccine, Determinants, Human Papillomavirus

## INTRODUCTION

Cervical cancer is an international public health issue and has remained the most common cancer impacting females globally (Fowler et al, 2025). The WHO (World Health Organization) estimates that over 600,000 new cervical cancer cases and more than 350,000 deaths happened internationally in 2022, with up to 90% of deaths in LMICs where prevention and screening services are restricted (WHO, 2025). According to the National Institute of Cancer (2024), consistent infection with high-risk kinds of HPV, especially types 16 and 18, causes many cervical cancers, which makes HPV vaccination an important preventive approach. In spite of the accessibility of effective and safe HPV vaccines for almost 2 decades, international coverage is still below global targets. As of 2024, the first-dose coverage within females aged from 9 to 14 years was approximated at 31%, below the 90% WHO's target by 2030 (WHO, 2025). In Sub-Saharan Africa, in which cervical cancer burden is disproportionately big, the introduction and uptake of HPV vaccine are behind the advanced regions and countries (Haddison et al, 2025). About 41% of eligible females in the African continent get the HPV vaccine, below the international target (Mengistie et al, 2025), which reflects major gaps in healthcare financing, capacity, plus society acceptance. In 2023, just 29 out of the 54 member states of the African Union have incorporated the vaccination of HPV into their country's immunisation schedules (Asempah and Ikpebe, 2024). The policy roll-out comes with logistical issues, restricted cold chain facilities, and limited funding (Asempah and Ikpebe, 2024).

Also, the advantages of scaling up vaccination of HPV in the continent is underlined by its big rate of cervical cancer and mortality, with about 70,000 deaths yearly in African females, a figure that has over 1/5 of international cervical cancer deaths (Adeyanju et al, 2024). In Nigeria, cervical cancer has been the second leading cause of cancer-associated deaths in women (Mafiana et al, 2022). According to Elvis et al (2023), 60.9 million Nigerian females aged from 15 years and older have a risk of having cervical cancer when there are no robust preventive measures, as HPV vaccination is seen as a major intervention (Elvis et al, 2023). Also, the government launched HPV vaccination into its routine immunisation policy in 2023, which targets about 7.7 million females aged from 9 to 14 years; the biggest single HPV vaccination initiative in sub Saharan Africa to date (WHO Africa, 2023). Further, reports by Evans School of Public Policy and Governance (2025) show that more than 12 to 13 million females have obtained at least 1 dose of the HPV vaccine after the start of the campaign, which reflects initial adoption success. Despite these achievements, the uptake is still suboptimal and heterogeneous in several communities and states in Nigeria, with estimations that range widely and drop-off between vaccine completion and initiation (Sadiq et al, 2025; Agha and Nsofor, 2025). Therefore, knowing the determinants of the uptake of HPV vaccine in the country is important in closing coverage gaps, directing policy, and informing interventions that target local contexts.

### Review Objectives

- i. To determine individual-level determinants, such as knowledge, attitudes, beliefs, and sociodemographics, related to uptake of HPV vaccination in Nigeria.
- ii. To evaluate health system and structural determinants affecting HPV vaccination uptake.
- iii. To examine socio-cultural and community-level determinants affecting the willingness and actual uptake.

## METHOD

### Study Design

This is a systematic review designed to synthesize evidence on determinants of the uptake of HPV vaccine in Nigeria. It followed the 2020 PRISMA guideline. Due to the heterogeneity in research populations and outcome definitions, the review did not conduct meta-analysis. Rather, the research employed a structured narrative synthesis strategy. Meanwhile, the review covered peer-reviewed articles published from 2017 to 2025. This duration was chosen to get evidence written before and after gradual policy shifts of Nigeria toward the launch and scale-up of HPV vaccine, including the pre-pilot initiatives and national rollout efforts.

### Eligibility Criteria

This table provides the inclusion criteria

**Table 1: Inclusion Criteria**

Requirement	Inclusion	Exclusion
<b>Population</b>	Women, parents/caregivers, adolescents, undergraduate students, community members, health workers, or civil servants in Nigeria.	People outside the country
<b>Interest phenomenon</b>	Determinants of the uptake of HPV vaccine, its willingness, acceptance, barriers, refusal, or facilitators	Articles that report only awareness with no extractable determinants
<b>Study design</b>	Cross-sectional, mixed-methods, and qualitative studies	Commentaries, editorials, and letters.
<b>The outcomes</b>	The uptake of HPV vaccine, willingness/intention to vaccinate, refusal, or acceptance	Articles with no important outcome measures
<b>Study settings</b>	Geopolitical zones of the country	Articles conducted outside the country
<b>Language</b>	English	Non-English
<b>Publication timeframe</b>	From 2017 to 2025	Articles published outside the duration

### Information Sources/Search Strategy

A comprehensive search was conducted across 4 databases. They are PubMed, ResearchGate, MDPI, and ScienceDirect. As shown in appendix 1, search terms combined keywords and subject headings related to HPV vaccine, uptake, acceptance, determinants, barriers, and Nigeria.

### Selection and Data Extraction

Every retrieved record was exported into Mendeley for deduplication. 2 reviewers independently screened abstracts/titles against the eligibility requirement. Then, the full texts of likely eligible articles were independently evaluated. Lastly, disagreement was resolved via discussion. In another vein, a standard data extraction form was utilised to gather details on the authors, publication year, location of the study, research design, population attributes, the sample size, HPV vaccine acceptance rates or uptake, determinants, and measures of association. This extraction was independently conducted by 2 reviewers.

### **Evaluation of Bias Risk and Data Synthesis**

As shown in appendix 2, the methodological quality plus bias risk were evaluated with JBI Critical Appraisal Checklists, which is chosen based on the study design. Each article was independently appraised by 2 reviewers. Further, due to the heterogeneity in research populations and outcome definitions, the review did not conduct meta-analysis. Rather, the research employed a structured narrative synthesis strategy. The determinants were divided into *individual-level, socio-cultural and community-level*, plus *health system/ structural-level factors*.

## **RESULTS AND DISCUSSION**

### **Scope and Study Selection**

As shown in figure 1, the selection process followed the 2020 PRISMA guidelines. 45 records were initially identified via 4 electronic databases of PubMed, ResearchGate, MDPI, and ScienceDirect. After removal of duplicates, 36 records remained and were screened by abstract/title. Out of them, 20 full-text articles were evaluated for eligibility. 8 articles were excluded at the full-text phase because of lack of extractable determinants, non-empirical designs, and non-Nigerian study settings. Finally, 12 articles met the inclusion requirement and were included in the last synthesis. Fig 1 shows the PRISMA flow diagram that documented every stage of the selection.

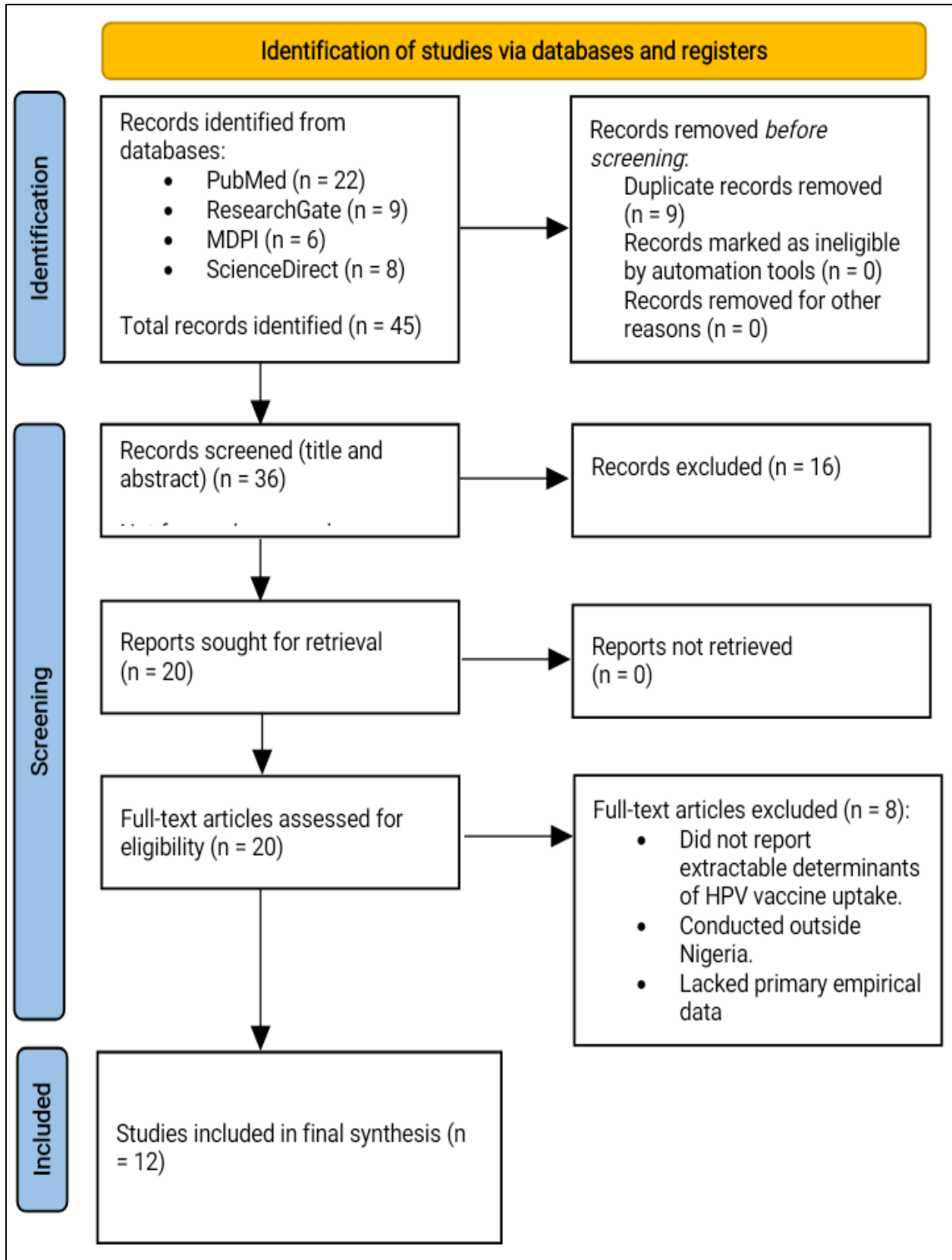


Fig 1: PRISMA Flowchart. Source: (Researcher, 2025)

### Study Characteristics

This table explains the major characteristics of the 12 final studies.

**Table 1. Included Studies characteristics (n=12)**

Author and year	Location of the study	Population of the study	Design of the study	Sample size	Major outcome measured
Adeyemi et al, 2021	Lagos State, Surulere	Urban adult females	Descriptive cross-sectional	208	Uptake of HPV vaccine plus testing
Ohareri et al, 2020	Oyo State, Ibadan	Parents	Descriptive cross-sectional	186	Attitudes, knowledge, and perceptions
Agha et al, 2024	6 states in Nigeria	Caregivers of females aged from 9 to 17	Cross-sectional	1429	Vaccine intention and acceptance
Sadiq et al, 2025	Kaduna State, Kaduna North LGA	Adolescent school girls from 10 to 19 years	Mixed-methods Cross-sectional	418	Uptake of HPV vaccine
Onasoga et al, 2025	Nigeria, North-Central	Women undergraduate students	Cross-sectional	380	Knowledge and uptake of HPV vaccine
Ezeogu et al, 2024	Imo State, Owerri	Caregivers/women	Cross-sectional	267	acceptance and perception
Agha and Nsofar, 2025	Adamawa, Abuja, and Nasarawa	Caregivers of girls aged from 9 to 17	Cross-sectional	4830	HPV vaccine uptake
Osuchukwu et al, 2025	Cross River State, University of Calabar	Women undergraduate students	Descriptive cross-sectional	213	Uptake of HPV vaccine
Clifford and Mike-Ogburia, 2025	Akwa Ibom State, Uyo	Women junior secondary students	Cross-sectional	400	Uptake of HPV vaccine
Ojimah and Maduka, 2017	Rivers State	Women undergraduate students	Descriptive cross-sectional	780	Awareness plus uptake
Akande and Akande, 2024	Nigeria, North-Central	Undergraduate students	Cross-sectional	240	Uptake, awareness, and willingness to pay
Okwe et al, 2019	Delta State Secretariat	Civil servants	Descriptive cross-sectional	285	HPV vaccination Acceptance

### **Range of Uptake**

Across the 12 included articles, the reported uptake of HPV vaccine in the country varied significantly by study setting and population group, ranging from 2.1%- 53.9%. The determinants related to these levels of uptake operated at 3 interconnected levels- sociocultural/community, health system/structural, and individual. The lowest rates of uptake were repeatedly found within female undergraduate students, in which vaccination ranged from 2.1%- 15%, with rates of completion generally below 8%. Also, among the Delta State civil servants, lesser than 8% had finished the suggested vaccine doses. Across adolescent schoolgirls, the uptake equally varied. Just 7.5% got at least one vaccine dose in Kaduna North Iga. In Akwa Ibom, 36.3% got at least one vaccine dose, but just 5.5% had finished the whole vaccination series. Meanwhile, the biggest (53.9%) reported uptake was seen across adolescent females in Abuja, Nasarawa, and Adamawa States via a multi-state survey. But this estimate relied on caregiver report instead of independent immunisation records' verification. In urban adult females in Lagos, the vaccine uptake was 29.0%. Notably, some caregiver-focused articles reported significant bigger levels of willingness or intention to vaccinate, getting up to 77.5% in several settings, with no corresponding confirmed vaccination evidence. This discrepancy underlines a constant intention–attitude gap in the uptake of HPV vaccine across various populations in the country.

### **Individual level determinants of the uptake of HPV vaccine**

In the 12 included articles, individual level determinants of the uptake of HPV vaccine include knowledge and awareness, sociodemographic features, attitudes, personal health history, and caregiver characteristics. Job plus marital status were major predictors across adult women. In the study conducted in surulere Lagos, being actively employed (AOR= 60.45, 95% CI 10.63-343.46) plus unmarried (AOR= 33.33, 95% CI 12.50-100.00) were related to bigger uptake of vaccines. Knowing someone with cervical cancer increased willingness and ability to vaccinate (AOR= 21.64, 95% CI 4.87-96.16). Within caregivers and parents, knowledge and education level were dominant determinants. In Oyo State's Ibadan, many parents showed big HPV vaccines knowledge (98.9%), but negative behaviours toward vaccine uptake were associated with perceived big expenses, fear of adverse impacts, and concerns regarding adolescent promiscuity. In the study conducted in Owerri by Ezeogu *et al* (2024), the tertiary education of fathers (OR= 2.25, 95% CI 1.28-3.85) and mothers (OR= 2.25, 95% CI 1.27-4.02) was related to caregivers' knowledge plus acceptance of HPV vaccines for their kids. Also, the willingness to vaccinate within caregivers got up to 77.5%.

In addition, caregiver motivation, capability, and previous experiences influenced the vaccine uptake. In a multi-state caregiver research by Agha *et al* (2024), bigger motivation plus ability scores, prior Covid-19 vaccination, and involvement in discussions with peers or family were related to elevated potential of vaccination for adolescent girls. Also, exposure to the messaging of HPV vaccine heightened the uptake (aOR= 6.87, 95% CI 6.20-7.61). Across students and adolescents, educational level, age, sexual history, plus knowledge were related to the uptake. In a study conducted in Kaduna North LGA by Sadiq *et al* (2025), just 7.5% of adolescent females received at least 1 vaccine dose. The uptake was related to vaccine awareness, willingness of the parents, and previous awareness of HPV risks. In junior school students in Uyo Akwaibom state, younger women aged from 9 to 13 years, the lower class of JSS1 to JSS2, plus ethnicity were predictors, as the levels of knowledge widely varied. More so, the female undergraduate students in several regions showed low vaccine uptake (2.1%-15.0%). The bigger age populations from 20 to 25 years, parity, marital status, multiple sexual partners, sexual activity, previous STI history, plus higher knowledge of HPV were related to the vaccine uptake. On the other hand, low knowledge levels predicted non-uptake. For civil servants in Delta State, individual income level shaped acceptance, with low earners indicating bigger acceptance than richer earners, while time limitations associated with work schedules impacted the vaccination completion.

In discussing the findings, the individual level factors played an essential duty in affecting the uptake of HPV vaccine, willingness, and acceptance in Nigeria. These factors are constantly anchored on awareness

and knowledge, sociodemographic features, perceived experience risk, and beliefs and attitudes. Awareness of cervical cancer, HPV infection, and the HPV vaccination emerged as consistent individual level factors. Research across adolescents, women, parents, civil servants, and undergraduates consistently indicated that insufficient or low knowledge was related to low vaccine uptake. Within Lagos urban females, Adeyemi et al noted that absence of awareness was a key challenge to vaccination in spite of moderate levels of uptake. In the same vein, Sadiq et al observed that while 65.1% of adolescent females in northern Kaduna have heard of HPV, just 42.3% had sufficient knowledge, which aligns with a low incidence (7.5%) of uptake. In undergraduate groups, low awareness levels were common and related to low uptake, as documented by Osuchukwu et al, Onasoga et al, Akande and Akande, and Ojimah and Maduka.

In addition, socio-demographic elements shaped vaccine uptake in several populations. Marital status and employment status were predictors within adult females, with unmarried and employed females more likely to be vaccinated in the Lagos research. In undergraduates, the study year, age, marital status, sexual activity, and parity were consistently related to vaccine uptake. Also, older students, sexually active students, those in higher years in academics, and students with previous STIs were more likely to get the vaccine. Within parents and caregivers, educational attainment was a core factor, with tertiary education related to better awareness and bigger acceptance of vaccination for kids. More so, personal experience and perceived risk with cervical cancer shaped individuals' decisions. Knowing a patient with cervical cancer elevated willingness and ability to vaccinate and undergo the testing of HPV in urban females. Within caregivers, perceived ability and motivation were related to acceptance plus perceived potential of adolescent vaccination. Previous exposure to campaigns on vaccination and prior Covid-19 vaccination experience further solidify the readiness of individuals to vaccinate. Belief-associated and attitudinal components equally influenced vaccine uptake. Fear of negative impacts, issues regarding fertility, and assumptions that HPV vaccines can enhance promiscuity were reported at the individual level across caregivers, parents, adolescents, and undergraduates. In studies in which knowledge levels were high, negative attitudes continued and undermined vaccine uptake. On the other hand, a positive view of the advantages of vaccines, efficiency of belief, and trust in healthcare information elevated acceptance and intent to go for vaccination.

### **Healthcare system and structural determinants**

Healthcare system and structural components affecting the uptake of HPV vaccine were reported in several of the included studies and constantly indicated service-delivery and access-related limitations. In Surulere Lagos, vaccination cost, unavailability of vaccination services, absence of recommendation by healthcare professionals, and constraint awareness from the healthcare system were reported as key challenges to the uptake of HPV vaccine plus testing among the urban females. Also, suggestions by healthcare professionals emerged as a major motivator where present, while its unavailability obstructed uptake. Within parents in Ibadan, big vaccine expenses (86%), distance to healthcare centres (83%), and insufficient information offered via health services (89%) were reported as key components that negatively impacts attitudes toward vaccination of HPV. More so, Agha et al (2024) research that involves caregivers in 6 states demonstrated that healthcare communication exposure, especially via structured vaccination messaging, was related to perceived potential of vaccination. Furthermore, the caregivers' capacity to access vaccination information and services, alongside previous involvement with health campaigns, were major determinants of acceptance as documented by Agha et al (2024) and Agha and Nsofar (2025).

In Kaduna, insufficient access to the points of vaccination, restricted school vaccination provision, and health system mistrust were determined as key structural challenges. Further, the qualitative results by Sadiq et al highlight poor engagement between schools and health authorities as an uptake limitation. For undergraduate female students in Cross River and North-Central Nigeria, absence of programs on institutional vaccination, inadequate awareness in tertiary institutions, and lack of routine on-campus vaccination were related to low rates of vaccine uptake, which ranges from 2.1%-15%. In Akwaibom,

logistical barriers associated with service delivery gaps, vaccine access, plus safety issues connected to insufficient health communication were disclosed as challenges in spite of the overall positive behaviour toward HPV vaccination. Across the civil servants in Delta, limited vaccination days, job time limitations, and inadequate physical availability of vaccination sites were related to low acceptance/completion of vaccination. In particular, less than 8% of participants had finished vaccination, with accessibility indicated a statistically significant relationship.

In discussing the findings, the evidence from the final included studies show that the healthcare system plus structural factors were consistent and influential in affecting the uptake of HPV vaccine in the country. These determinants acted at several levels, such as vaccine access, vaccination services' availability, cost, engagement of health workers, and wider service delivery limitations. Financial/cost problems were identified as key constraints. In particular, Adeyemi et al noted that cost was a major challenge to the vaccination of HPV in Surulere urban females, which led to low vaccine uptake in spite of the moderate awareness. In the same vein, Ohareri et al observed that many (86%) parents in Ibadan revealed financial limitations as a component that negatively affected their behaviour toward the uptake of HPV vaccine. Within undergraduate students, Akande and Akande (2024) observed low (2.2%) uptake plus a low intention to pay, which shows that out of pocket payment criteria can restrict access. These results imply that affordability is still a vital barrier, especially in places where vaccination of HPV is not always offered freely.

Also, availability of vaccination services featured significantly. In Ohareri et al research, 83% of parents reported distance to health facilities as a deterrent in the uptake of vaccines. Similarly, the Delta State study outlined constraint vaccination sites and inaccessibility as major determinants affecting acceptance within civil servants. Time limitations connected to job schedules further complicated the access barrier, with civil servants expressing that the scope/nature of their jobs restricted the chance to attend sessions on vaccination. Related access-associated challenges were reported in the Sadiq et al mixed-methods research, in which low access to the points of vaccination was reported as a key hindrance for adolescent females in northern Kaduna. Service delivery practices and health worker influence were equally essential determinants. The Surulere study in Lagos identified suggestions/recommendations by healthcare professionals as a key motivator for vaccination and testing of HPV, while the lack of such suggestions served as a challenge. This result resonates with findings from Agha et al research, which demonstrated that the perceived ability to vaccinate by the caregivers was related to expected uptake. Where health personnel actively engaged with caregivers and offered explicit guidance, the vaccine acceptance was bigger. Also, multiple studies noted the wider system-level vulnerabilities or weaknesses, such as inadequate adoption of HPV vaccination into school-based or routine services. In particular, Sadiq et al noted low involvement with authority in schools as a deterrent, while Clifford and Mike-Ogburia revealed logistical issues as major challenges in spite of generally positive behaviours among students. These results imply gaps in delivery measures/mechanisms for vaccination of adolescents. Lastly, healthcare system mistrust and concerns regarding safety of vaccines, connected to weak communication measures, intertwine with structural challenges. Sadiq et al's qualitative results outlined mistrust of the healthcare system as a cause of low uptake, which reinforces the need for transparent communication and reliable service delivery.

### **Sociocultural and community level determinants**

In the 12 included articles, several sociocultural and community components were revealed in shaping the uptake of HPV vaccine, willingness, and acceptance in the country. Fear concerns were constantly identified. In particular, Adeyemi et al noted that fear of vaccine side impacts plus harm were key challenges within urban women. In the same vein, Ohareri et al observed that many parents (80%) reported concern about adverse impacts, while 82% expressed the fear that vaccination of HPV can increase promiscuity of adolescents. Also, in female undergraduates in Cross River, fears of side impacts (mean score= 3.17) plus misconceptions of the vaccines to promiscuity (mean= 1.73) were dominant challenges. Further, religious beliefs and cultural norms were recurrent factors. In the Northern part of

Kaduna, cultural behaviours toward vaccinations plus socio-cultural misconceptions were related to non-uptake, with findings disclosing community mistrust and religious myths as deterrents. Also, religious beliefs were noted as a contributing element to hesitancy within female undergraduates in Calabar (mean=2.95).

In addition, caregiver and parental influence were prominent in articles that involve adolescents. For instance, Sadiq et al noted that the willingness of parents to vaccinate was a major predictor of vaccine uptake in school girls. Also, parental disapproval was seen as a key challenge in both qualitative and quantitative elements of the Kaduna research. In Owerri, while mothers (77.5%) reported vaccination intentions to their daughters, restricted knowledge of the role of HPV in the prevention of cervical cancer continued. More so, interpersonal influence and social norms were reported. The study conducted in Surulere identified recommendations/suggestions from relatives and friends as vaccination motivators. Furthermore, Agha et al demonstrated that social factors, such as injunctive norms and family and friends discussions, were related to caregivers' perceived potential of having their daughters vaccinated. In the big caregiver survey conducted in 2025 by Agha and Nsofor, exposure to the messaging or HPV vaccine across digital and social environments was related to bigger vaccine uptake. Also, community and ethnic differences were noted in the adolescent groups. In particular, Clifford and Mike-Ogburia (2025) observed that Anang ethnic group students were less likely to be vaccinated compared with other populations. The community-associated challenges like safety concerns, limited awareness, and logistical problems were reported as hindrances to vaccine uptake in the ethnic group.

In discussing the findings, community level and sociocultural determinants emerged as vital impacts on the uptake of HPV vaccine plus acceptance in the country. These factors operated mainly via beliefs on sexuality, social norms, parental authority, community trust, informal information networks, and religious interpretations, which often influences decisions stronger than just the biomedical knowledge. The fear of the effects of vaccine intake, especially concerns regarding promiscuity, was repeatedly reported as socio-cultural challenges. Also, studies across caregivers and parents in Kaduna North LGA and Oyo State noted broad beliefs that vaccination of HPV may encourage early sexual activity in girls, in spite of the positive vaccine general awareness. Related misconceptions were equally reported in female undergraduates in Rivers and Cross Rivers, in which vaccination was culturally seen as unnecessary for sexually inactive individuals and unmarried.

Moral and religious beliefs equally played a major role. For example, in northern Kaduna, the qualitative finding outlined the impact of religious myths, such as views that vaccination of HPV conflicts with faith/religious values. Within university students in Cross River, religious beliefs were related to vaccine hesitancy, plus fears of side impacts and moral judgments regarding vaccination. Also, community trust plus social influence were major challenges and facilitators. In 2021, Adeyemi et al noted that suggestions from relatives, friends, and media positively affect the intention to vaccinate in Lagos urban females, while absence of endorsement in social networks discouraged vaccine uptake. In the same vein, studies on caregivers show that social discussions with peers and family, injunctive norms, plus exposure to community messaging influenced perceived potential of adolescent vaccination. More so, parental authority emerged as an important community-level factor for adolescents. Research within secondary school girls by Clifford and Mike-Ogburia and Sadiq et al repeatedly demonstrated that parental approval and intention were predictors of vaccine uptake, while disapproval from parents served as a key barrier. Also, mothers' training/education plus household decision making power were impactful, with bigger parental education related to higher intention and acceptance to vaccinate, as reported by Ezeogu et al. Regional and ethnic variations further underlined the community element of the uptake of HPV vaccine. In 2025, Clifford and Mike-Ogburia reported low uptake in students from the ethnic group of Anang, which shows that localised cultural contexts influence the behaviour of vaccination. Also, regional differences were evident in caregiver studies. It reflects variations in messaging exposure, community engagement, plus normative acceptance, as documented by Agha and Nsofar (2025).

### **Bias Risk and Publication Bias**

In the final included studies, many sources of methodological bias were determined, which mostly reflects similarities in research design and data gathering strategies. Almost every article adopted cross-sectional designs that limit causal inference and heighten susceptibility to temporal ambiguity. Therefore, relationships reported between the uptake/acceptance of HPV vaccine and determinants reflect correlations at one point in time instead of directional impacts. In particular, selection bias is recurrent. Several articles depended on non-probability or convenience sampling, especially ones done across caregivers who attend health facilities, female undergraduates, or respondents hired through social media. For instance, articles that hired caregivers via Instagram and Facebook were limited to people with internet access plus social media engagement, which potentially removed less digitally engaged groups. In the same vein, facility hiring of civil servants and mothers might have over-represented participants already engaging with health services, thereby inflating reported levels of intention or awareness. Also, information bias was evident across the 12 studies because of heavy dependence on self-reported data/information for the uptake or HPV vaccine, attitudes, knowledge, plus intentions. In addition, social desirability bias might have affected responses, particularly in articles that address sensitive topics like religious beliefs, vaccine hesitancy, and adolescent sexuality. In many studies, vaccine uptake was not verified via immunisation records, which increases misclassification risk. More so, measurement bias was found in studies that evaluated intention or perceived potential of vaccination instead of confirmed receipt of the vaccine. Although these outcomes were relevant, they do not equate to actual uptake and might overestimate the real/true coverage. Also, questionnaire instruments' variability plus knowledge scales restricted consistency in the included studies.

Concerning publication bias, the evidence might be twisted toward studies that report statistically significant relationships or critical challenges, as non-significant or null results have less potential to be published. Also, the dominance of quantitative cross-sectional studies, with just a mixed-methods approach, further implies underrepresentation of qualitative evidence that can capture dissenting or contextual views. In addition, all the articles were published under peer-reviewed journals. This may limit inclusion of unpublished policy evaluations or even routine immunisation data that might underreport implementation failures or challenges.

### **Study implications and future directions**

The results from the 12 studies have vital implications for policies on HPV vaccination plus implementation in the country. Across different populations, the uptake of HPV vaccine remains low in spite of moderate-high awareness levels in some settings. This outlines a gap between intention, knowledge, plus actual vaccination, which shows that information provision alone is inadequate to drive vaccine uptake. Therefore, programme or policy measures should move beyond the awareness campaigns to mitigate behavioural, practical, plus structural challenges that restrict acceptance and availability. Also, healthcare associated implications are pronounced. Expenses, vaccination sites' distance, low availability, and absence of healthcare personnels' recommendation have emerged as challenges. These results support the importance of integrating HPV vaccination more efficiently into school-based and routine immunisation services, increase points of vaccination, and maintain constant vaccine supply. Similarly, solidifying the capacity of healthcare workers to recommend HPV vaccination is vital, as professional endorsement was a good motivator across several studies.

There are also sociocultural implications. Fear of negative impacts, issues regarding fertility and promiscuity, parental disapproval, and religious misconceptions were commonly noted, particularly for adolescent females. These results underline the need for community engagement and culturally sensitive measures that incorporate parents, school authorities, religious leaders, and reliable community figures. Also, messaging needs to clearly address moral and myths concerns while stressing the vaccination preventive health benefits. Furthermore, caregiver-based studies suggest that behavioural components play a major duty in decisions on vaccination. Therefore, future interventions need to input behaviourally informed strategies that improve confidence of caregivers, lessened logistical challenges, and responsibly

optimise digital platforms and social networks. More so, future studies need to prioritise intervention-based and longitudinal research to evaluate how programme changes, behavioural interventions, and school-focused delivery models affect sustained uptake and completion of HPV vaccines. There is equally the importance of bigger geographic representation, especially in rural and places, and for research that clearly differentiate between acceptance, intention, and verified uptake of vaccines.

## Conclusion

This review has synthesised evidence from peer-reviewed articles published from 2017 to 2025 in order to assess the determinants of the uptake of HPV vaccine in Nigeria. Across different geographical settings and populations, the uptake of HPV vaccination is still low, in spite of the increasing HPV awareness plus its connection to cervical cancer. The systematic review indicated that vaccine uptake is influenced by an interaction of socio-cultural, individual, plus healthcare system components instead of knowledge alone. Individually, sociodemographic attributes like marital status, age, education, sexual history, employment, and previous exposure to HPV-associated information were related to uptake and intention to vaccinate. Nevertheless, these determinants often acted in the wider contextual limitations. The influence of socio-cultural dynamics played a key function in affecting acceptance, especially among young women and adolescents. Also, health system challenges like cost, restricted access to vaccination sites, logistical limitations, weak provider recommendation further limited the actual uptake even where intention was big. Generally, the evidence outlines a continued gap between vaccination behaviour and intention in Nigeria. Mitigating this gap needs a coordinated, multi level intervention that will integrate demand creation with health system solidification, appropriate culturally community engagement, and efficient caregiver-based measures.

## REFERENCES

- Adeyanju, G. C., Esoh, T.-A., Sidibe, A. R., Kyesi, F., & Aina, M. (2024). Human Papillomavirus Vaccination Acceleration and Introduction in Sub-Saharan Africa: A Multi-Country Cohort Analysis. *Vaccines*, 12(5), 489. <https://doi.org/10.3390/vaccines12050489>
- Adeyemi, A. Ugwu, A. Kuku, J. et al. (2021). Predictors, barriers and motivating factors for human papillomavirus vaccination and testing as preventive measures for cervical cancer: A study of urban women in Lagos, Nigeria. *Preventive Medicine Reports*, 24(1), 101643. <https://doi.org/10.1016/j.pmedr.2021.101643>
- Agha, S., Bernard, D., Francis, S., Fareed, A., & Nsofor, I. (2024). Determinants of Human Papillomavirus Vaccine Acceptance among Caregivers in Nigeria: A Fogg Behavior Model-Based Approach. *Vaccines*, 12(1), 84. <https://doi.org/10.3390/vaccines12010084>
- Agha, S. and Nsofor, I. (2025). HPV vaccine uptake among adolescent girls in Nigeria: The complex role of caregivers' education. *PLoS One*, 20(7): e0325684. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0325684>
- Akande, O. W., & Akande, T. M. (2024). Human Papillomavirus Vaccination amongst Students in a Tertiary Institution in North Central Nigeria: A Cross-sectional Study on Sociodemographic Factors Associated with Its Awareness, Uptake and Willingness to Pay. *The Nigerian postgraduate medical journal*, 31(1), 14–24. [https://doi.org/10.4103/npmj.npmj.265\\_23](https://doi.org/10.4103/npmj.npmj.265_23)
- Asempah, E., & Ikpebe, E. (2024). Accelerating HPV vaccination in Africa for health equity. *Global health research and policy*, 9(1), 37. <https://doi.org/10.1186/s41256-024-00380-z>
- Chukwudi Osuchukwu, E., O U Okpuru, P., Ezekiel, R., & B Standley, I. (2025). Factors Influencing The Uptake Of Human Papillomavirus Vaccine Among Female Undergraduate Students At The University Of Calabar, Cross River State, Nigeria. *Global Journal of Pure and Applied Sciences*, 31(3), 499–507. <https://doi.org/10.4314/gjpas.v31i3.6>
- Clifford, M.C. and Mike-Ogburia, M.I. (2025). Determinants of HPV vaccine uptake among female junior secondary school students in Uyo, Nigeria. *Discov Public Health*, 22, 614 . <https://doi.org/10.1186/s12982-025-01010-w>

- Elvis Anyaehiechukwu Okolie et al. (2023). Spotlight on Human Papillomavirus Vaccination Coverage: Is Nigeria Making Any Progress?. *JCO Global Oncology*, 9(1), e2300088 <https://doi.org/10.1200/GO.23.00088>
- Evans School of Public Policy & Governance. (2025). Achieving 71% HPV Vaccination Coverage in Nigeria. Available at-<https://evans.uw.edu/achieving-71-hpv-vaccination-coverage-in-nigeria/> (Assessed: 31 December, 2025).
- Fowler JR, Maani EV, Dunton CJ, et al. Cervical Cancer. (2025). In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available at- <https://www.ncbi.nlm.nih.gov/books/NBK431093/>
- Haddison, E.C., Engoung, D.B., Bodo, C.B. et al. (2025). Overcoming HPV vaccine hesitancy: insights from a successful school-based vaccination campaign in the Saa health district of Cameroon. *BMC Infect Dis*, 25(1), 465 . <https://doi.org/10.1186/s12879-025-10864-z>
- Joseph Ezeogu, Kingsley Asinobi, Chidimma Noela Okeji, and Chioma Theresa Chimah. (2024). Perception and Acceptance of Human Papilloma Virus Vaccine by Mothers in Owerri, Nigeria: A Cross Sectional Study. *Asian Journal of Medicine and Health* 22 (8):56–64. <https://doi.org/10.9734/ajmah/2024/v22i81069>.
- Mafiana, J. J., Dhital, S., Halabia, M., & Wang, X. (2022). Barriers to uptake of cervical cancer screening in Nigeria: a systematic review. *African health sciences*, 22(2), 295–309. <https://doi.org/10.4314/ahs.v22i2.33>
- Mengistie, B. A., Yirsaw, A. N., Lakew, G., Mekonnen, G. B., Shibabaw, A. A., Chereka, A. A., Kitil, G. W., Wondie, W. T., Abuhay, A. E., & Getachew, E. (2025). Human papillomavirus vaccine uptake and its determinants among women in Africa: an umbrella review. *Frontiers in public health*, 13, 1537250. <https://doi.org/10.3389/fpubh.2025.1537250>
- National Institute of Cancer. (2024). Cervical Cancer Causes, Risk Factors, and Prevention. Available at- <https://www.cancer.gov/types/cervical/causes-risk-prevention> (Assessed: 31 December, 2025).
- Ohareri, B. Adefolaju, A. and Onyeneho, C. (2020). Knowledge, attitudes and perceptions of Nigerian parents towards human papilloma virus (HPV) vaccines. *European Journal of Midwifery*, 4(2), <https://doi.org/10.18332/ejm/114886>
- Ojimah, C. and Maduka, O. (2017). Awareness and uptake of human papillomavirus vaccines among female undergraduate students: Implications for cervical cancer prevention in South-South, Nigeria. *Port Harcourt Medical Journal*, 11(3), 134-140. <https://doi.org/10.60787/phmj.v11i3.126>
- Okwe, U. N., Chime, H., & Nwose, E. U. (2019). Factors influencing the acceptance of HPV vaccine among civil servants in Delta State Secretariat. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 8(4), 1227–1232. <https://doi.org/10.18203/2320-1770.ijrcog20191176>
- Onasoga, O. A., Dosumu, T. O., Folarin, A. O., & Shittu, B. M. (2025). Knowledge and Uptake of Human Papilloma Virus Vaccine among Female Undergraduate Students in North-Central, Nigeria: A Cross-Sectional Study. *International journal of community based nursing and midwifery*, 13(2), 126–137. <https://doi.org/10.30476/ijcbnm.2025.102762.2509>
- Sadiq, F. Udu, A. Jikamshi, Z. et al. (2025). Human Papillomavirus Vaccine Uptake and Its Associated Factors among Adolescent Girls in Kaduna North LGA, Nigeria: A Mixed-Methods Study. *IPS Journal of Public Health*, 5(4), 484-492. <https://doi.org/10.54117/h29xw539>
- World Health Organization. (2025). Cervical cancer. Available at- <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer> (Assessed: 31 December, 2025).
- World Health Organization. (2025). Immunization coverage. Available at- <https://www.who.int/news-room/fact-sheets/detail/immunization-coverage> (Assessed: 31 December, 2025).
- WHO Africa. (2023). Nigeria to vaccinate 7.7 million girls against leading cause of cervical cancer. Available at- <https://www.afro.who.int/countries/nigeria/news/nigeria-vaccinate-77-million-girls-against-leading-cause-cervical-cancer> (Assessed: 31 December, 2025).

## Appendix 1: Search Strategy

### PubMed (MEDLINE)

The PubMed search incorporated Medical Subject Headings (MeSH) and free-text terms using the following search string:

("Papillomavirus Vaccines"[MeSH] OR "HPV vaccine" OR "human papillomavirus vaccine" OR "cervical cancer vaccine")

AND

("vaccine uptake" OR uptake OR accept\* OR willingness OR hesitan\* OR coverage OR utilization)

AND

(determinant\* OR factor\* OR predictor\* OR barrier\* OR facilitator\*)

AND

(Nigeria OR Nigerian)

Filters applied included English language and publication date between 2017 and 2025.

### ScienceDirect

ScienceDirect was searched using keyword combinations in the title, abstract, and keyword fields:

("HPV vaccine" OR "human papillomavirus vaccine" OR "cervical cancer vaccine")

AND

(uptake OR acceptance OR willingness OR hesitancy OR coverage)

AND

(determinants OR factors OR barriers OR predictors)

AND

(Nigeria)

Results were refined to research articles published within the study period.

### MDPI

The MDPI database was searched using the advanced search interface with the following terms:

("HPV vaccine" OR "human papillomavirus vaccination")

AND

(uptake OR acceptance OR willingness)

AND

(determinants OR barriers OR predictors)

AND

(Nigeria)

Only peer-reviewed articles published in English between 2017 and 2025 were included.

### ResearchGate

ResearchGate was searched using the following keyword combinations:

"HPV vaccine uptake Nigeria"

"HPV vaccination acceptance Nigeria"

"determinants of HPV vaccine Nigeria"

"barriers to HPV vaccination Nigeria"

Only full-text peer-reviewed journal articles conducted in Nigeria were screened.

**Appendix 2: Methodological quality and risk of bias with the JBI Critical Appraisal Checklists**

