

Barriers, Facilitators, and Implementation Strategies for Reaching $\geq 90\%$ HPV Vaccine Coverage in Girls Aged 9–14 Years in Nigeria: A Comprehensive Literature Review Aligned with WHO Guidelines

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Received: August 27, 2026; **Accepted:** September 02, 2026; **Published:** September 15, 2026

Abstract

Cervical cancer remains a leading cause of cancer morbidity and mortality among women in Nigeria, with an estimated 12,312 new cases and 7,599 deaths in 2024. The WHO Global Strategy to Accelerate the Elimination of Cervical Cancer as a Public Health Problem sets a target of 90% HPV vaccination coverage of girls by age 15. Nigeria introduced its national single-dose HPV vaccination program in October 2023 for girls aged 9–14 years using school- and community-based approaches. By late 2024, more than 12 million girls had been vaccinated, yet coverage remains below the 90% target. This comprehensive literature review synthesizes current evidence on barriers, facilitators, and implementation strategies in the Nigerian context. Uptake in individual studies ranged from 23.4% to 57.2%, while national cumulative figures exceeded 12 million girls.

Key barriers included low awareness, misconceptions about infertility and promiscuity, safety fears, cultural and religious attitudes, and logistical challenges. Facilitators included campaign exposure (adjusted odds ratio 6.87), school-based delivery, free vaccine provision, and engagement of female or younger caregivers. Effective strategies comprised multi-component communication, engagement with religious and community leaders, human-centered design, and mHealth interventions (adjusted odds ratio: 3.05). Achieving $\geq 90\%$ coverage requires sustained, equity-focused, multi-level strategies fully aligned with the WHO Global Strategy.

Keywords: Barriers, Facilitators, Girls 9–14 years, HPV Vaccination, Implementation Strategies, Nigeria, WHO 90-70-90, Obstetrics/Gynecology, Pathology, Infectious Disease

Introduction and Background

Cervical cancer is the second most common cancer among women in Nigeria, with an estimated 12,312 new cases and 7,599 deaths in 2024 (age-standardized incidence rate 19.1 per 100,000 women) [1]. Persistent high-risk human papillomavirus (HPV) infection, especially types 16 and 18, causes the vast majority of cases. The WHO Global Strategy to Accelerate the

Elimination of Cervical Cancer as a Public Health Problem sets the 90-70-90 targets, with 90% HPV vaccination coverage of girls by age 15 as the cornerstone [2].

Nigeria launched its national HPV vaccination program in October 2023 using school- and community-based approaches for girls aged 9–14 years. By late 2024, over 12 million girls had received at least one dose, yet coverage remains below 90% [3]. This comprehensive literature review synthesizes evidence on the barriers, facilitators, and implementation strategies needed to reach the WHO target of $\geq 90\%$.

Citation: Joyce O Ederhion, Edesiri Oghwegha, Daniel O Okeke, Innocent Okoacha, Abel S Anegbe, et al. Barriers, Facilitators, and Implementation Strategies for Reaching $\geq 90\%$ HPV Vaccine Coverage in Girls Aged 9–14 Years in Nigeria: A Comprehensive Literature Review Aligned with WHO Guidelines. *J Infect Dis Treat.* 2026. 4(3): 1-5. DOI: doi.org/10.61440/JIDT.2026.v4.86

Review

Methods

This comprehensive literature review synthesized empirical and program evidence on barriers, facilitators, and implementation strategies for HPV vaccination of girls aged 9–14 years in Nigeria.

Inclusion Criteria

Empirical quantitative, qualitative, or mixed-methods studies conducted in Nigeria that reported on barriers, facilitators, uptake rates, or implementation strategies for HPV vaccination in girls aged 9–14 years, published between 1 January 2020 and 30 June 2026. Key grey literature sources providing national coverage data and WHO recommendations were also eligible for inclusion.

Exclusion Criteria

Studies conducted outside Nigeria, studies focused exclusively on boys or adult women, studies published before 1 January 2020, non-empirical opinion pieces or commentaries without original data, and studies that did not address barriers, facilitators,

uptake, or implementation strategies in the target age group.

Searches were performed in PubMed, Google Scholar, African Journals Online, and grey literature sources (including UNICEF, WHO, and Gavi). The selection process followed PRISMA 2020 guidance [4]. Twenty-six sources were included in the narrative thematic synthesis. Data were extracted on study characteristics, uptake, barriers, facilitators, and strategies.

Study Quality Assessment

Study quality was assessed using a simplified critical appraisal checklist covering the clarity of objectives, the appropriateness of the design and sampling, the adequacy of the sample size and data collection, and the transparency of reporting. Each empirical study was rated as having Low, Moderate, or High methodological concerns (Table 2).

Discussion

The characteristics of the key empirical studies are shown in Table 1 and the quality assessment in Table 2.

Table 1: Characteristics of the Included Empirical Studies

Author(s) & Year	Design	Setting	Population / Sample	Key Findings
Imarengiaye et al., 2026	Mixed-methods	Benin City	Female adolescents (n≈801)	Uptake 23.4%; fear of side effects dominant barrier
Agha & Nsofor, 2025	Cross-sectional	Multi-state	Caregivers (n=4,830)	Uptake 53.9%; campaign exposure aOR 6.87
Yusuf et al., 2024	Cross-sectional	Kano	Parents/caregivers	High hesitancy; safety & low awareness
Talabi et al., 2023	Mixed-methods	Nigeria	Caregivers + stakeholders	Awareness & school delivery key facilitators
Philemon et al., 2025	Survey	Taraba	Caregivers of girls 9–14	Cultural/religious barriers ≈52%
Clifford et al., 2025	Cross-sectional	Uyo	Junior secondary girls	School setting important determinant
Asaolu et al., 2025	Qualitative	Multi-site	Parents & school administrators	Role of trusted messengers
Okunade et al., 2025	RCT	Lagos	Mothers	mHealth aOR 3.05
Manga et al., 2025	Delphi	National	Stakeholders	Infertility & promiscuity myths
Kubura et al., 2025	Qualitative	National	Stakeholders	Community engagement lessons
Aminu et al., 2026	Mixed-methods	Nigeria	16 studies	Knowledge gap central; uptake lags acceptance
Ezechukwu et al., 2026	Qualitative	Kano/Kaduna/Lagos	Implementers	Systemic & socio-cultural barriers
Olubayo et al., 2026	Mixed-methods	Multi-state	HCWs & caregivers	Contextual rollout determinants
Egbon et al., 2022	Programme evaluation	Rural North	Girls & community	School-based feasible with strong communication

Individual studies reported HPV vaccine uptake ranging from 23.4% in Benin City to 57.2% in multi-state samples, with higher rates in school-based and campaign-exposed groups [5,6].

National data show that more than 12 million girls had been vaccinated by late 2024 [3,7].

Table 2: Quality Assessment of Included Empirical Studies

Study (Author, Year)	Design	Clarity of Objectives	Sampling & Design	Sample Size / Data Collection	Reporting Transparency	Overall Methodological Concern
Imarengiaye et al., 2026	Mixed-methods	Good	Moderate	Adequate	Good	Moderate
Agha & Nsofor, 2025	Cross-sectional	Good	Good	Large	Good	Low
Yusuf et al., 2024	Cross-sectional	Good	Moderate	Adequate	Good	Moderate
Talabi et al., 2023	Mixed-methods	Good	Good	Adequate	Good	Low–Moderate
Philemon et al., 2025	Survey	Adequate	Moderate	Limited detail	Moderate	Moderate–High
Clifford et al., 2025	Cross-sectional	Good	Moderate	Adequate	Good	Moderate
Asaolu et al., 2025	Qualitative	Good	Good	Appropriate	Good	Low–Moderate
Okunade et al., 2025	RCT	Good	Good	Adequate	Good	Low
Manga et al., 2025	Delphi	Good	Good	Appropriate	Good	Low–Moderate
Kubura et al., 2025	Qualitative	Good	Good	Appropriate	Good	Low–Moderate
Aminu et al., 2026	Mixed-methods	Good	Good	Comprehensive	Good	Low
Ezechukwu et al., 2026	Qualitative	Good	Good	Appropriate	Good	Low–Moderate
Olubayo et al., 2026	Mixed-methods	Good	Good	Adequate	Good	Low–Moderate
Egbon et al., 2022	Programme evaluation	Good	Moderate	Limited	Moderate	Moderate

The most consistent barriers were low awareness, misconceptions about infertility and promiscuity, safety concerns, and cultural or religious attitudes (reported by approximately 52% of caregivers in one northern state) [5,8-10]. Logistical challenges including stock-outs, rural–urban disparities, school absenteeism, and difficulty reaching out-of-school girls were also common [11,12]. Some studies noted lower uptake among more educated caregivers [6]. These findings are consistent with evidence from sub-Saharan Africa [13].

Key facilitators included exposure to vaccination campaigns (adjusted odds ratio 6.87), school-based delivery, free vaccine provision, and having female or younger caregivers [6,11,14]. Trust in health workers and community leaders further supported uptake [14,15].

Effective strategies included multi-component communication in local languages, engagement of religious and traditional leaders, teachers, and community networks, human-centered design, and mHealth interventions (adjusted odds ratio 3.05) [15-17]. School-based delivery combined with community outreach was the most feasible model for high and equitable coverage [12,18,19].

These results align with regional experience and WHO guidance [20-22]. Additional recent Nigerian studies and program reports

confirm the same barriers and the value of sustained community engagement [23-26].

Nigeria has rapidly scaled up HPV vaccination since October 2023, protecting more than 12 million girls [3,7]. Coverage nevertheless remains below the 90% target. The main demand-side barriers are low awareness, myths about infertility and promiscuity, and safety concerns, particularly in northern states [5,8-10]. These can be addressed through continuous culturally appropriate communication by trusted religious and community leaders [15,18].

Supply-side problems (stock-outs, geographic access, out-of-school girls) require stronger logistics and complementary community outreach [11,12,24]. School-based platforms remain the most efficient delivery channel when supported by community strategies [18,19].

Campaign exposure (adjusted odds ratio 6.87) and mHealth interventions (adjusted odds ratio 3.05) significantly increase uptake [6,16]. Broader evidence from Africa supports these findings [13,20]. Long-term success depends on transition to routine immunization of nine-year-old girls and continuous equity monitoring.

Limitations

This review relied mainly on early post-2023 Nigerian data and selected grey literature. A simplified quality assessment was performed rather than a full formal risk-of-bias evaluation.

Long-term coverage trends and health impact data were not yet available. Findings may have limited generalizability beyond the current Nigerian context.

Conclusion

Achieving 90% HPV vaccination coverage among girls aged 9–14 years in Nigeria is both possible and essential for cervical cancer elimination. Nigeria must scale up school-based programs with strong teacher involvement, expand multi-channel communication including mHealth, and prioritize partnership with religious and community leaders. Misconceptions must be confronted through sustained culturally sensitive education, and equity must be actively monitored by geography and education level. With deliberate multi-level action fully aligned with the WHO Global Strategy, Nigeria can make a decisive contribution to the global 90-70-90 elimination agenda.

References

1. International Agency for Research on Cancer. Global Cancer Observatory: Cancer Today – GLOBOCAN 2024: Nigeria [Internet]. Lyon: International Agency for Research on Cancer; 2024. <https://gco.iarc.who.int/media/globocan/factsheets/populations/566-nigeria-fact-sheet.pdf>
2. World Health Organization. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: World Health Organization. 2020.
3. United Nations Children's Fund. Generations unite in Nigeria's HPV vaccine campaign [Internet]. New York: UNICEF; 2024. <https://www.unicef.org/stories/generations-unite-nigerias-hpv-vaccine-campaign>
4. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021. 29: 372.
5. Imarengiaye EO, Iweka RO, Anya CJ, Nwaogwugwu JC, Ofili AN. Knowledge, acceptance, uptake barriers and missed opportunities of human papillomavirus vaccine among female adolescents in Benin City, Nigeria: A mixed method study. *Int J Gynaecol Obstet*. 2026. 172: 373-382.
6. Agha S, Nsofor I. HPV vaccine uptake among adolescent girls in Nigeria: The complex role of caregivers' education. *PLoS One*. 2025. 20: e0325684.
7. Dumo E. Nigerian army wives take the fight to cervical cancer [Internet]. Gavi, the Vaccine Alliance; 2025. <https://www.gavi.org/vaccineswork/nigerian-army-wives-take-fight-cervical-cancer>
8. Yusuf KK, Olorunsaiye CZ, Gadanya MA, Ouedraogo S, Abdullahi AA, et al. HPV vaccine hesitancy among parents and caregivers of adolescents in Northern Nigeria. *Vaccine X*. 2024. 21: 100591.
9. Philemon B, Lakama PY, Aiyagbonrhule P, Abah OG, Solomon ME, et al. Barriers and Facilitators Influencing HPV Vaccine Uptake Among Caregivers of Females Aged 9-14 Years in Taraba State of Nigeria. *Direct Res. J. Health Pharm.* [Internet]. 2025. 12: 20-26. <https://journals.directresearchpublisher.org/index.php/drjhp/article/view/188>
10. Manga MM, Fowotade A, Modibbo ZI, Madhivhandila M, Ndao T, et al. Misconceptions leading to human papillomavirus vaccination hesitancy in Nigeria: findings from a modified Delphi panel with stakeholders of the immunization ecosystem. *Vaccine X*. 2025. 27: 100729.
11. Talabi O, Gilbert H, Fawzi MCS, Anorlu R, Randall T. Examining barriers and facilitators of HPV vaccination in Nigeria, in the context of an innovative delivery model: a mixed-methods study. *BMJ Public Health*. 2023. 1: e000003.
12. Egbon M, Ojo T, Aliyu A, Bagudu ZS. Challenges and lessons from a school-based human papillomavirus (HPV) vaccination program for adolescent girls in a rural Nigerian community. *BMC Public Health*. 2022. 22: 1611.
13. 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: 974.
14. Asaolu SO, Kubura D, Erekosima G, Dauda M, Popoola G, et al. Perceptions of HPV and HPV vaccines among parents and caregivers of girls aged 9-14 years in Nigeria: a qualitative study. *Discov Public Health*. 2025. 22: 856.
15. Kubura D, Sampson S, Erekosima G, Dauda M, Atobatele S, et al. Stakeholders' perspectives on lessons learnt from HPV mass vaccination in Nigeria. *BMC Public Health*. 2025. 25: 3062.
16. Okunade KS, Fayinto AI, Adekanye TV, Allsop MJ, Adelabu H, et al. Randomized Controlled Trial of Impact of Mobile Health Technologies on Human Papillomavirus Vaccination Uptake in Mothers of Vaccine-Eligible Girls in Lagos, Nigeria (mHealth-HPV). *JCO Glob Oncol*. 2025. 11: e2500150.
17. JSI Research & Training Institute. Synthesis of HPV program learnings in Nigeria [Internet]. 2025. TechNet-21 report page.
18. Ahmed RG, Hassan E, Ali D. Coverage performance and lessons learned from the multi age cohort campaign for HPV vaccine introduction in phase one states of Nigeria [Preprint]. *Research Square*. 2025.
19. Waheed DE, Bolio A, Kyesi F, Miano CW, Tefera YL, et al. Routine HPV vaccination: Reflection on delivery strategies based on countries' experiences. *Vaccine*. 2024. 42: S37-S40.
20. Brotherton JML, LaMontagne DS, Bloem PJN. Global status of HPV vaccination two decades in: effective, safe and preventing cancer. *Expert Rev Vaccines*. 2026. 25: 2609869.
21. World Health Organization Regional Office for Africa. Regional Immunisation Technical Advisory Group (RITAG): meeting report [Internet]. Brazzaville: World Health Organization Regional Office for Africa. 2023. https://www.afro.who.int/sites/default/files/202405/RITAG%20MEETING%20REPORT_16052024.pdf
22. WHO guideline on school health services [Internet]. Geneva: World Health Organization. 2021. <https://www.who.int/publications/i/item/978924002939>
23. Aminu K, Okeke EB, Jayasinghe YA, Maduabuchi CN, Olorunlana A, et al. Determinants of human papillomavirus vaccination uptake in Nigeria: a mixed-methods systematic review. *BMC Public Health*. 2026. 26: 1588.
24. Ezechukwu C, Ayandipo EO, Osoteku D, Ibrahim R,

- Raheem O, et al. Gaps and barriers preventing sustained delivery of HPV vaccination in Kano, Kaduna, and Lagos states: An exploratory qualitative study. PLoS One. 2026. 21: e0350510.
25. Olubayo GT, Bakare A, Salako J, Olufayo OE, Bakare AA. Early implementation and contextual determinants of the human papillomavirus vaccine rollout and uptake in Nigeria: a mixed-methods study. Front Public Health. 2026. 14: 1834756.
26. Clifford MC, Mike-Ogburia MI. Determinants of HPV vaccine uptake among female junior secondary school students in Uyo, Nigeria. Discov Public Health. 2025. 22: 614.