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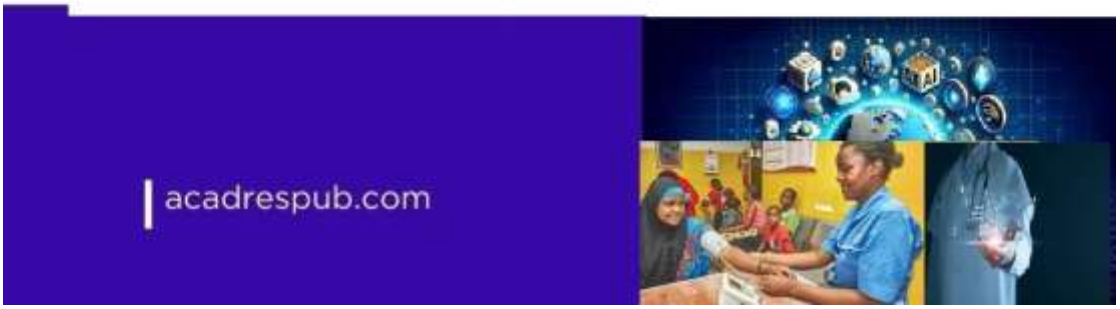

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CERVICAL CANCER PREVENTION, SCREENING UPTAKE, AND HEALTH SYSTEM RESPONSE IN EDO STATE: A NARRATIVE REVIEW

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ABSTRACT

Cervical cancer remains a major public health challenge globally, particularly in low- and middle-income countries where the burden of disease, mortality, and limited access to preventive healthcare services remain high. Nigeria continues to experience a substantial burden of cervical cancer despite ongoing national and international efforts aimed at improving prevention, screening, and treatment services. This review examined the current state of cervical cancer in Edo State, with emphasis on prevalence, awareness, screening uptake, HPV vaccination, healthcare policies, cancer registries, advocacy programmes, palliative care, and factors influencing cervical cancer screening practices among women of childbearing age. A literature search was conducted using PubMed, The Cochrane Library, and Google Scholar. Relevant articles, policy documents, and reports relating to cervical cancer etiology, screening, HPV testing, prevalence, awareness, and barriers affecting cervical cancer screening uptake in Nigeria and Edo State were reviewed.

Findings from the review indicate that persistent infection with high-risk human papillomavirus remains the major etiological factor associated with cervical cancer. Although cervical cancer awareness campaigns and HPV vaccination initiatives have increased in Edo State, knowledge and uptake of cervical cancer screening services remain relatively low, particularly in rural communities. Cytology-based screening remain the most accessible screening approaches in many healthcare facilities, while HPV DNA testing is still limited. The review further revealed that Edo State benefits from national cervical cancer control policies, cancer financing mechanisms, advocacy programmes, and the Edo- Benin Cancer Registry, which supports cancer surveillance and research activities within the state. However, challenges including poor screening uptake, inadequate palliative care coverage, financial barriers, limited healthcare infrastructure, and insufficient population-wide access to HPV DNA testing persist.

In conclusion, cervical cancer continues to pose a significant health burden in Edo State despite ongoing interventions. Strengthening healthcare infrastructure, expanding HPV vaccination and screening programmes, improving awareness, enhancing access to affordable cancer care, and increasing community-based interventions are essential for achieving cervical cancer elimination targets in Edo State and Nigeria at large.

Keywords: Cervical cancer; Human papillomavirus (HPV); Cervical cancer screening; HPV vaccination

Introduction

Cervical cancer or malignant neoplasm is a non-communicable disease with significant global health problem especially in low- and middle- income countries (Jouya et al., 2026: Allanson et al., 2021).The Human Papilloma Virus (HPV) center (2019) in its report on cervical cancer indicated a prevalence of about 80% attributed to developing countries, making it one of the most common cancers affecting women world- wide. It is a significant cause of cancer -related death among women in low income areas, mostly because of the high occurrence of the causative agent, the human papilloma virus (HPV). Annually, an estimated 529,000 new cases are diagnosed, with the overwhelming majority concentrated in resource-limited settings in Africa and Asia (WHO, 2020). This disparity underscores the stark inequities in healthcare access, preventive measures, and treatment availability.

Nigeria, which ranks fifth in terms of cancer related morbidity and mortality, is a prime example of the pressing need for cancer control measures. Data from the Ibadan Population-Based Cancer Registry (IPBCR) covering 2009-2010 indicate an age-standardized mortality rate (ASR) of 36.0 per 100,000 women (Olubodun et al., 2019). In line with the World Health Organization cervical cancer elimination strategy, the Federal Government of Nigeria incorporated the 90- 70- 90 intervention targets into the National Cervical Cancer Elimination Strategic Plan aimed at eliminating cervical cancer by 2030 (Tobin et al., 2024). Among the key objectives of the strategy is the recommendation that 70% of women should undergo screening with a high-performance test by the ages of 35 and 45 years.

HPV DNA testing remains the preferred method for cervical cancer screening; however, other screening modalities are also available. In most urban health-care facilities in Nigeria, cervical cancer screening is commonly performed using cytological procedures, while Visual Inspection with Acetic Acid/Lugol's Iodine (VIA/VILI) is also utilized as an alternative screening approach. In addition, early HPV vaccination remains an important preventive strategy in reducing the incidence of cervical cancer (Brisson et al., 2020). The implementation of comprehensive public health initiatives, including widespread HPV immunization, routine screening, and enhanced health-care infrastructure and facility for diagnosis, is critical in reducing its incidence and mortality. Addressing these gaps requires not only governmental commitment but also community-driven interventions and Non- governmental Organisations to improve education, awareness, affordability, and accessibility to preventive care.
This paper will focus on the current state of cervical cancer in Edo State, Nigeria, with the aim of determining the Factors influencing cervical cancer screening practice among women of child bearing age in Edo State, Nigeria.

Statement of the problem

Numerous literatures indicates an increase in cervical cancer among rural dwellers (Abugu *et al*., 2021), despite it being preventable through early detection and HPV vaccination. Cervical cancer continues to disproportionately affect women in rural settings due to factors such as lack of awareness, cultural stigma, inadequate health-care infrastructure, and financial barriers are among the factors leading to the continuous increase in HPV incidence. In this rural community, women may face even greater challenges due to the absence of widespread screening programs, accessibility to health care facility and limited knowledge about cervical cancer prevention. This is concerning because it causes social and emotional trauma in addition to the economic hardship encountered among rural dwellers.

Methods

The literature search for this study was performed using PubMed, The Cochrane Library, and Google Scholar. The search terms included cervical cancer etiology, cervical cancer screening, HPV testing, barriers and factors affecting uptake and utilization of cervical screening in Nigeria.

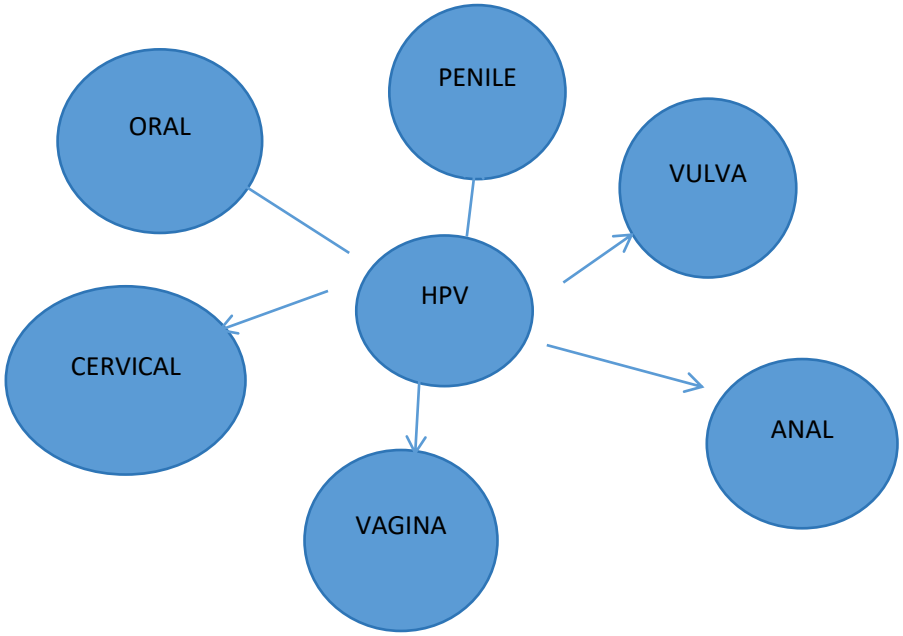
Etiology

Human papillomavirus (HPV) has been identified as a necessary cause of cervical cancer (Onwuamah et al.,2026) and occurrence is found in most sexually active people at some point during their lifetime. There are more than 130 types of known HPV, with 20 HPV types identified as cancer-related (Fowler et al., 2023). HPV exposure rates are only known in women since men are not screened outside of research protocols. HPV types 16 and 18 are the most common HPV types identified in invasive cervical cancer (National

Cancer Institute, 2025). Population-based HPV prevalence studies show the greatest prevalence of high-risk HPV occurs in adults younger than 25 years, and cervical cancer deaths peak in middle-aged women between 40 and 50 years. Studies have shown that HPV-related cervical disease in women younger than 25 years is largely self-limiting. However, those with coinfection of multiple HPV types may be less likely to have spontaneous clearance and, thus, progress to cancer.

HPV is transmitted by skin-to-skin contact, including during sexual intercourse, hand-to-genital contact, and oral sex. Risk factors for HPV and cervical cancer include young age at sexual initiation, multiple sexual partners, high parity, smoking, herpes simplex, HIV, coinfection with other genital infections, and oral contraceptive use (Boyden et al., 2023).

HPV is a non-enveloped, double-stranded, circular DNA virus of the Papillomaviridae family. The virus enters the epithelium through disruption to the skin/mucosa and infects basal stem cells. Its genome contains seven early (*E*) and two late (*L*) phase genes required for viral propagation. The viral DNA may remain as an independent episome for a period before integrating into the host's genome. HPV preferentially integrates at fragile sites in the human DNA where the strand is prone to breakages (Mehta & Laimins, 2018).



Adapted from National Cancer Institute, 2025

Cervical Cancer Prevalence and Incidence

The incidence and prevalence of cervical cancer has reduced significantly in developed countries compared to developing countries (Wu et al., 2022). This finding is not unconnected with the use of screening methods such as the introduction of human papillomavirus (HPV) vaccination programs among adolescent females in some developed countries is likely to widen the cervical cancer gap between developed and developing countries. Furthermore, the global HIV pandemic has more severe impact on sub-Saharan Africa (Okoye et al., 2021).

As of 2024, the population of Edo State is estimated to be approximately 5.25 million, according to projections.. Current estimates indicate that every year 560 women are diagnosed with cervical cancer and 368 die from the disease. Cervical cancer ranks as the 2nd most frequent cancer among women in Benin and the 2nd most frequent cancer among women between 15 and 44 years of age.

The Incidence of Cervical Cancer in relation to Demographic Characteristics of a study conducted in Edo state reported 1.8% (Momodu et al 2024), while HPV prevalence rate of 16.6% was obtained in a rural community of Edo state (Okoeguale et al.,

2022). Six HPV serotypes; 16, 18, 35, 45, 52 and 58 were detected, considering the oncogenic potentials of these subtypes. Likewise a retrospective study conducted between 2016- 2021 had prevalence of 7.0%, 1.7%, 4.9%, 6.1%, 7.5%, 10.8%. This disparity and variation in prevalence are attributed to awareness to cervical cancer screening and vaccination schedule.

Cervical Cancer Awareness

Cervical cancer is the second most frequent cancer among women, therefore an urgent need for information and education on awareness of cervical cancer and early detection measures plays a critical role (Abugu and Nwagu, 2021). The level of knowledge and utilization of cervical cytological services among women in Edo state is unclear due to lack of reliable population-based cancer registry or prevention program databases. However, Cervical cancer awareness in Edo State is increasing through targeted campaigns, community outreach, and HPV vaccination initiatives, particularly in early 2026.A study conducted in Benin City showed that there is poor knowledge and practice of the cervical cancer screening. In a study conducted in Egor state, majority of the respondents has a poor knowledge of cervical cancer screening and its importance (Ehwarieme and Emina, 2022). The observation that high awareness of cervical cancer does not equate to high knowledge of its risk factors and prevention is consistent with research findings in Edo State and across Nigeria. Studies indicate that while many women have "heard" of the disease, their understanding of what causes it and how to prevent it remains poor (Akinnibosun et al., 2024).

Cervical cancer control policies

Under the provisions of the National Health Act of 2014, responsibilities for healthcare delivery and management in Nigeria are distributed across the three tiers of government: the Federal Government, State Governments, and Local Government Areas (LGAs). The Federal Government primarily performs regulatory and advisory functions, in addition to coordinating tertiary healthcare services and financing major infrastructural developments. State governments are responsible for the administration of secondary healthcare services, while LGAs oversee primary healthcare services, including Primary Health Care (PHC) centres (NHA, 2014). Despite the public healthcare structure, approximately 60% of healthcare services in Nigeria are delivered through the private sector.

In an effort to improve the country's Universal Health Coverage (UHC) index, several healthcare financing initiatives have been introduced, including the establishment of the National Health Insurance Authority, which is responsible for implementing the Basic Health Care Provision Fund (BHCPF). Furthermore, the National Institute for Cancer Research and Treatment is implementing the National Cancer Health Fund (NCHF), which supports the provision of chemotherapy and radiotherapy services for cervical cancer patients in six public comprehensive cancer centres across the country.

Successive cancer-related policy frameworks in Nigeria have also emphasized interventions aimed at improving access to cervical cancer screening and early diagnosis. Both the National Strategic Cancer Control Plan (NSCCP) 2023–2027 and the National Strategic Plan for the Prevention and Control of Cancer of the Cervix in Nigeria 2023–2027 prioritize the expansion of cervical cancer screening services, with a target of screening 50% of women aged 25- 49 years by 2027 using HPV DNA testing, alongside the provision of adequate and effective treatment for pre-cancerous lesions (FMOH, 2017).

Edo State is among the beneficiaries of these national healthcare financing and cancer control initiatives, including the BHCPF, NHIA-supported healthcare services, and NICRAT cancer funding programs, which collectively contribute to strengthening cervical cancer prevention, screening, diagnosis, and treatment services within the state.

HPV vaccination in Edo State

In 2024, the Edo State Government launched a free Human Papilloma Virus (HPV) vaccination programme targeting girls between the ages of 9 and 14 years as part of efforts to enhance cervical cancer prevention within the state (Edo State Government, 2024). Although HPV vaccines have been approved for use in Nigeria, there is currently no fully organized government-endorsed national immunization programme for HPV vaccination. Nevertheless, the bivalent and quadrivalent HPV vaccines have been available in the state over the past seven years and are administered upon request. In addition, sensitization workshops and advocacy campaigns aimed at increasing vaccine awareness and demand are periodically conducted (Ezeanochie and Olasimbo,2020).

Table 1: Approved HPV Vaccines and Serotypes covered

HPV vaccine	Approved	Serotype Covered	Availability
Cervarix	2007	HPV 16 and 18	Licensed for use in Nigeria but not the primary vaccine in the current national HPV vaccination rollout
Gardasil	2006	HPV 6, 11, 16, 18.	Available through national immunization campaigns for girls aged 9–14 years
Gardasil 9	2014	HPV 6, 11, 16, 18, 31, 33, 45, 52, 58	Availability mainly through private healthcare facilities

Cervical screening

Cervical cancer screening is the foremost public health intervention for cervical cancer control, which has dramatically reduced the burden of the disease in high-income countries (HICs). This success has not been replicated in low- and middle-income countries (LMICs) due to poor uptake of screening. In a study conducted in Edo North, The majority of respondents (67.3%) in the study were not aware of the purpose of Pap test and HPV testing for cervical cancer screening with only 32.7% of respondents having awareness of the purpose (Momodu et al., 2024). Likewise in a similar study conducted in central Benin, all participants demonstrated knowledge of cervical cancer and screening, with 64.6% having adequate knowledge and 61.1% possessing positive risk perceptions (Tobin et al., 2024).Factors such as awareness level, risk perception, socioeconomic status, availability of female healthcare providers, fear of positive screening results, partner influence, and sociocultural norms were not found to significantly influence cervical cancer screening uptake in these study areas. Contrary to previous reports (Okunade et al., 2022) suggesting that limited National Health Insurance Scheme (NHIS) coverage and exclusion of HPV DNA testing may hinder cervical cancer screening uptake, the present study did not find these factors to have a significant influence on screening uptake among the study population. Nevertheless, expanding screening coverage to women in the informal sector and incorporating HPV DNA testing into NHIS screening options may further strengthen efforts toward achieving the World Health Organization target of screening 70% of women with a high-performance test at least twice by the ages of 35 and 45 years.

Palliative care in Edo state

Palliative care offers cervical cancer patients an improved quality of life if they present when the cure is unattainable. 80% of patients with cancer in Nigeria will require this form of care (Mollaoğlu et al., 2019). Palliative care coverage in the state however remains low, estimated at less than 1%.Key challenges facing palliative care include limited availability of hospital-based services, absence of paediatric palliative care, significant shortage of trained professionals, lack of appropriate infrastructure and absence of community and home-based palliative care services (Impact Review Report, 2025). A system to ensure competencies, standards, or quality control across services is also lacking.

Cancer registries and Data management

The country has made notable strides in strengthening cancer registration and surveillance, including the launch of the 2024 National Cancer Registry Regulations (NCR) that established the National Cancer Registry of Nigeria, which is comprised of 26 population-based (PBCR) and hospital-based (HBCR) registries. Five PBCRs (Abuja, Calabar, Ekiti, Enugu and Ibadan) contribute data to Nigeria's Globocan estimates and participate actively in the regional.However, the state has an established population-based cancer registry known as the Benin Cancer Registry, domiciled at the University of Benin Teaching Hospital. The registry was established in 2008 and later upgraded to a Population-Based Cancer Registry to support cancer surveillance, incidence reporting, and epidemiological research within the state (Akintola et al., 2021)

Cervical Cancer Advocacy and Support Groups

Edo State benefits from cervical cancer advocacy, awareness, screening, and support initiatives coordinated by governmental and non-governmental organizations. Several organizations and advocacy groups within the state actively promote cervical cancer prevention through public awareness campaigns, free screening exercises, HPV vaccination advocacy, patient support, and community outreach programmes. These include the Medical Women's Association of Nigeria, Cancer Advocacy Nigeria, Women Health and Action Research Centre, and other community-based organizations involved in cancer prevention and women's reproductive health advocacy. In addition, periodic free cervical cancer screening programmes and awareness campaigns have been conducted in Benin City and other parts of the state. Similarly, Cancer Advocacy Nigeria (CANCAD) has implemented cervical cancer awareness and outreach programmes in Benin City, Irrua, and Ekpoma, Edo State.

Cancer Care funding in Edo state

Cancer care constitutes a substantial financial burden in Nigeria, particularly in view of the high poverty rate and limited health insurance coverage (Okeke et al., 2025). The cost of diagnosis and treatment has been identified as a major contributor to delayed presentation and poor treatment outcomes among cancer patients (Ogunniyi et al., 2025). Although there is limited evidence of a dedicated state-owned cancer care fund in Edo State, patients within the state benefit from several national and non-governmental support initiatives aimed at reducing the financial burden of cancer treatment. Organizations such as the Medicaid Cancer Foundation and the Foundation for Cancer Care provide support services including subsidized chemotherapy, patient navigation, awareness campaigns, and psychosocial care. In addition, Edo State benefits from national healthcare financing interventions such as the Basic Health Care Provision Fund (BHCPF), National Health Insurance Authority (NHIA)-supported services, and cancer control programmes coordinated by the National Institute for Cancer Research and Treatment.

Clinical Trials

Evidence from Edo State indicates active participation in cancer-related epidemiological and clinical research through the Edo- Benin Cancer Registry, a population-based registry established at the University of Benin Teaching Hospital. The registry collects cancer data from multiple healthcare facilities, including histopathology laboratories and specialist hospitals, thereby supporting cancer surveillance and research within the state (Oko- Oboh et al., 2025). Studies derived from the registry have contributed to understanding cervical cancer incidence, detection methods, treatment patterns, and outcomes in Edo State. Although large-scale interventional clinical trials remain limited, these registry-based studies provide important local evidence for cancer prevention and control strategies in the state.

Conclusion

Cervical cancer remains a significant public health concern in Nigeria, including Edo State, where efforts to improve prevention, screening, and treatment are ongoing. Available evidence indicates that although national policies and state-level interventions such as HPV vaccination campaigns, screening programmes, and cancer awareness initiatives have been implemented, uptake of cervical cancer screening services remains suboptimal.

Furthermore, while Edo State benefits from national financing mechanisms and cancer support initiatives, access to comprehensive and sustainable cancer care is still limited, particularly among women in rural and low-income populations. The presence of the Edo–Benin Cancer Registry and hospital-based research activities demonstrates progress in cancer surveillance and evidence generation; however, gaps still exist in large-scale clinical trials, population-wide screening coverage, and equitable access to HPV DNA testing.

Therefore, strengthening health system capacity, expanding community-based awareness, integrating HPV vaccination into routine immunization programmes, and improving access to affordable screening and treatment services are essential to achieving cervical cancer elimination targets in Edo State and Nigeria at large.

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