Imperatives of the Socio- Ecological Communication Model Towards Combating Cervical Cancer Among Rural Women in Nigeria: A Prescriptive Approach

[1]Anthony Ogande PhD, [2]Moses Ter Akase PhD & [3]Ndaliman Aibe Mikailu

[1,2&3]Department of Mass Communication, Nasarawa State University Keffi, Nigeria
Email: anthonyogande1971@gmail.com, akaseter@gmail.com & aibe15249@gmail.com

Abstract

This study explores the critical role of the socio-ecological communication model in addressing the rising incidence of cervical cancer among rural women in Nigeria. Utilizing secondary data sourced from academic journals, government reports, and empirical studies conducted across various contexts, it evaluates the inherent limitations of current communication strategies, which predominantly focus on curative measures such as human papillomavirus vaccination and cervical screening programmes. Findings reveal that these interventions frequently neglect the broader environmental and societal contexts—namely, the microsystem, mesosystem, exosystem, and macrosystem—that are essential for sustaining meaningful behavioural change among individuals and communities. The findings of the study reveal that an overemphasis on pharmaceutical solutions overlooks vital non-pharmaceutical protocols, including efforts to tackle pervasive social issues like child marriage, alcohol consumption, smoking, illiteracy, and poverty, all of which contribute significantly to the disease's prevalence. It concludes that stakeholders must adopt a holistic socio-ecological approach, seamlessly integrating preventive measures with curative efforts to effectively combat cervical cancer in rural Nigeria. Recommendations include strengthening legislative frameworks, enhancing girl-child education initiatives, engaging community and religious leaders in health advocacy, and deploying culturally sensitive media campaigns through local languages and traditional platforms to foster sustainable health outcomes among vulnerable populations.

Keywords: Communication Strategies, Cervical Cancer, Socio-Ecological Model, Behavioural Change, Rural Women, Nigeria

Introduction

Effective communication stands as a cornerstone of successful health interventions, yet its efficacy is deeply intertwined with the broader societal and environmental contexts in which it operates. In Nigeria, cervical cancer ranks as the second most prevalent cancer among women aged 15 to 44, claiming approximately 8,000 lives each year and registering over 12,000 new cases annually (ICO/IARC, 2023). With 11.9% of the country's 60.9 million women aged 15 and above affected, the disease represents a formidable public health challenge, particularly in rural areas where access to healthcare services remains severely limited (World Health Organization, 2024). Historically, communication strategies aimed at behavioural change in health contexts have focused narrowly on influencing individual actions, such as encouraging women to seek human papillomavirus vaccination or participate in cervical screening programmes. Proponents of this approach often assume that once an individual adopts a new behaviour aligned with the intended health message, the strategy can be deemed successful. However, this perspective frequently sidelines the profound influence of societal systems, rendering such changes fleeting and unsustainable without broader structural support (Caperon, Saville & Ahern, 2022; Green, Richard & Potvin, 1996).

The nexus between development and communication is undeniable if health initiatives are to gain traction and acceptance within communities (Sen, 2012). Kreps (2012) underscores that effective health communication is indispensable for enabling vulnerable populations to recognize health risks and respond appropriately, particularly for complex diseases like cervical cancer, which are often shrouded in misinformation and misunderstanding. Nigeria's rich cultural tapestry—comprising over 300 ethnic groups, more than 500 languages, and a predominantly rural populace—presents both a challenge and an opportunity for such efforts (Green, 2023). Yet, current communication strategies in Nigeria, often heavily weighted towards curative interventions, fail to adequately address the underlying social determinants that perpetuate cervical cancer's prevalence, including poverty, gender inequality, early marriage, and limited educational opportunities (World Health Organization, 2017). This study contends that socio-ecological communication model offers a prescriptive and comprehensive pathway forward, advocating for a shift from an individual-centric focus to a system-wide approach that engages the full spectrum of societal influences to combat cervical cancer among rural Nigerian women effectively.

Theoretical Underpinning: The Socio-Ecological Communication Model

The socio-ecological communication model, originally conceptualized by Urie Bronfenbrenner in 1979 within his seminal work *The Ecology of Human Development*, provides the theoretical foundation for this paper's argument. This model frames human behaviour as the product of interconnected societal systems, encompassing the microsystem (individual and immediate family), mesosystem (interactions between immediate settings like family and community), exosystem (external institutions such as healthcare facilities or local government), and macrosystem (overarching cultural norms, values, and societal structures). Kincaid, Figueroa and Storey (2020) elaborate that this model adopts a holistic systems approach, prioritising the interrelatedness and complexity of these layers over a reductionist focus on individual actions alone. It rests on two central principles: embeddedness, where each system is hierarchically connected to others, and emergence, where the collective impact of these systems exceeds the sum of their individual contributions, offering a robust analytical lens for understanding and influencing health communication dynamics (McLaren & Hawe, 2005).

In the context of cervical cancer prevention, the socio-ecological communication model illuminates how individual health-seeking behaviours—such as attending screening sessions or accepting vaccination—are profoundly shaped by familial support, community attitudes, institutional accessibility, and prevailing cultural values. For example, a rural Nigerian woman might fully intend to seek cervical screening but encounter resistance from her husband (microsystem), face a lack of nearby health clinics (exosystem), or be deterred by societal stigma surrounding reproductive health discussions (macrosystem) (Olubodun et al., 2022). Unlike traditional models that isolate individual decision-making, the socio-ecological approach advocates for interventions that address these layers concurrently, ensuring that behavioural changes are not only initiated but also sustained over time. This study leverages the socio-ecological communication model to argue that combating cervical cancer necessitates a multi-level strategy, one that transcends the limitations of curative-focused efforts and engages the broader socio-ecological context to foster lasting health improvements among rural women.

Limitations of Curative-Focused Communication Strategies

Nigeria's efforts to curb cervical cancer have predominantly centred on curative measures, with significant emphasis placed on promoting human papillomavirus vaccination and cervical

screening programmes. Notable initiatives, such as the collaboration between the Niger State government and the World Health Organization in January 2022, exemplify this approach, aiming to align with the global cervical cancer elimination strategy (World Health Organization, 2022). A wealth of studies—including those by Ayinde, Omigbodun and Ilesanmi (2004), Gana, Oche, and Ango (2016) and Ihudiebube-Splendor *et al* (2019) - document extensive campaigns designed to increase awareness and uptake of these curative interventions across various Nigerian populations. However, these strategies exhibit a linear, individual-centric bias, often neglecting the broader socio-ecological context that is critical for sustaining meaningful behavioural change over extended periods (Cunningham et al., 2015; World Health Organization, 2023).

For instance, Gana et al (2016) conducted an educational programme targeting market women in Niger State, successfully raising awareness about cervical screening among participants. Despite this achievement, actual uptake remained disappointingly low, with participants citing prohibitive costs, long distances to health facilities, and a lack of available services as primary barriers—challenges that lie beyond individual control and reflect systemic shortcomings. Similarly, Adejoro (2023) reports that the distribution of human papillomavirus vaccines across Nigeria remains grossly inadequate, with high costs serving as a significant deterrent for rural women, who constitute the majority of the vulnerable population. Data from the World Health Organization (2024) further reveal that only 12% of Nigerian women utilize modern contraceptives, a statistic that underscores the broader issue of limited access to preventive health tools, even when awareness campaigns are in place.

This over-reliance on pharmaceutical solutions is compounded by a failure to address non-pharmaceutical risk factors that the socio-ecological model identifies as critical macrosystem influences driving cervical cancer incidence. Issues such as early marriage, excessive smoking, alcohol consumption, and entrenched poverty—all well-documented contributors to the disease—are frequently overlooked in these curative-focused strategies (Mafiana, Dhital & Halabia, 2022; Huang *et al*., 2022). The consequence is a persistent gap between intention and action, where rural women may be informed about vaccination or screening but lack the environmental support needed to act on this knowledge. Consequently, these strategies prove insufficient for addressing the unique challenges faced by rural Nigerian contexts, where systemic barriers consistently undermine individual-level interventions.

Socio-Environmental Determinants of Cervical Cancer

The prevalence of cervical cancer among rural Nigerian women is intricately linked to a complex web of socio-environmental determinants, which the socio-ecological communication model categorizes across its four systemic layers: microsystem, mesosystem, exosystem, and macrosystem. Understanding these determinants in depth is essential for crafting communication strategies that transcend superficial fixes and address the root causes perpetuating the disease's high incidence.

At the microsystem level, family dynamics and deeply ingrained gender norms significantly restrict women's autonomy in health decision-making processes. Olubodun et al. (2022) conducted focus group discussions in Lagos from February to April 2019, revealing that 60% of women in low-resource settings required spousal approval before seeking cervical screening—a pattern likely even more pronounced in rural Nigeria, where patriarchal traditions hold stronger sway (Adamu, Abiola & Ibrahim, 2012). Consider the case of Amina, a hypothetical rural woman in Kano State: despite awareness of her risk factors from a local health talk, she hesitates to visit a clinic because her husband views such actions as unnecessary unless she exhibits visible

symptoms. This microsystem barrier stifles her ability to engage directly with healthcare providers, delaying timely interventions that could prevent the progression of precancerous conditions.

The mesosystem, which encompasses interactions between family and community settings, further entrenches these challenges through cultural taboos and social expectations. De Souza, Van de Broucke and Pattanshetty (2020) highlight how societal norms in sub-Saharan Africa often silence discussions on reproductive health, framing topics like cervical cancer as private or shameful. In rural Nigerian villages, community gatherings may reinforce these taboos, with elder women cautioning younger ones against discussing intimate health issues with outsiders, including health workers. For instance, in a typical Yoruba community, a woman experiencing abnormal bleeding might confide only in her mother-in-law, who, bound by tradition, advises patience rather than medical consultation, perpetuating a cycle of ignorance and risk. This interplay between family and community underscores how communication must penetrate these relational networks to effect change.

Moving to the exosystem, external institutional and economic conditions significantly exacerbate rural women's vulnerability to cervical cancer. Zhetpisbayeva, Kassymbekova and Sarmuldayeva (2023) conducted a scoping review of studies from 2004 to 2021, noting that rural areas globally—and Nigeria specifically—suffer from a severe dearth of medical facilities, limited personnel, and inadequate funding for health services. In Nasarawa State, for example, only 28% of rural women accessed skilled birth attendants in 2024, a stark contrast to 65% in urban centres like Lafia, reflecting the uneven distribution of healthcare infrastructure (Nasarawa State Health Report, 2024). Financial constraints compound this issue; Mahumud, Alam and Dunn (2019) found that even in countries with better resources, such as Australia, cost remains a barrier to vaccine uptake—a challenge magnified in Nigeria, where rural families often subsist on less than £1 daily. Imagine Fatima, a farmer's wife in Sokoto: the nearest clinic is 20 kilometres away, requiring transport she cannot afford, and the £10 cost of a screening test exceeds her monthly earnings. This exosystem reality highlights the futility of awareness alone without accessible services.

At the macrosystem level, overarching societal norms and structural conditions—such as early marriage, multiple sexual partners, excessive alcohol consumption, and pervasive poverty—elevate cervical cancer risk across rural Nigeria. Huang et al. (2022) analysed global trends using data from the 2018 Global Cancer Observatory, finding that countries with low human development indices, like Nigeria, exhibit higher cervical cancer incidence and mortality, with alcohol use identified as a significant risk factor. In rural Benue State, young girls married off at 14 face early sexual activity and frequent pregnancies, increasing their exposure to human papillomavirus—a primary cause of cervical cancer (World Health Organization, 2017). Similarly, smoking and alcohol use, often socially accepted among men but increasingly adopted by women in some communities, amplify risk, yet public health campaigns rarely address these behaviours directly (Basoya & Anjankar, 2022). Poverty, affecting over 70% of rural Nigerians, limits access to nutritious diets and preventive care, creating a fertile ground for disease proliferation (Adebisi *et al.*, 2021).

These socio-environmental determinants collectively illustrate that individual action alone cannot suffice in combating cervical cancer. Smedley and Syme (2000) argue persuasively that addressing health at social and environmental levels yields superior outcomes compared to an exclusive focus on individuals, drawing parallels with historical examples like the 19th-century decline in mortality rates in the United States and Britain, attributed to improved living standards and hygiene rather than medical breakthroughs alone (Fisher, 2008). In Nigeria, this historical lesson resonates:

tackling systemic factors through strategic communication is not merely an option but an imperative for achieving lasting reductions in cervical cancer incidence among rural women. The socio-ecological model thus serves as a vital tool, urging stakeholders to look beyond the individual and confront the environmental underpinnings that sustain this public health crisis.

Cultural and Literacy Barriers in Rural Nigeria

Cultural norms and low literacy levels present formidable barriers to effective cervical cancer communication in rural Nigeria, where the country's diversity—over 500 languages and 300 ethnic groups—shapes health perceptions and behaviours in profound ways (Green, 2023). These barriers, rooted in the macrosystem of the socio-ecological model, obstruct the dissemination and comprehension of health information, perpetuating ignorance and inaction among vulnerable populations.

Cultural norms across Nigeria's rural communities often cast reproductive health issues, including cervical cancer, as taboo subjects unfit for open discussion. Adedimeji *et al* (2021) conducted a study in a high-HIV-prevalence context, finding that cultural beliefs frequently stigmatize cervical screening, with many women fearing social ostracism or accusations of promiscuity if they seek such services. In a typical Hausa community in Jigawa State, for example, a woman like Halima might avoid discussing persistent pelvic pain with a male health worker, perceiving it as immodest under the practice of purdah, which restricts her interactions with men outside her family. Mafiana *et al* (2022) further document how misconceptions—such as the belief that screening causes infertility—deter uptake, with focus groups in rural Nigeria revealing that 40% of women held this view, rooted in cultural narratives passed down through generations. Kreps (2012) warns that misinformation thrives in such culturally insensitive environments, leaving women confused about prevention, detection, and treatment options, and thus less likely to act on available health information.

Low literacy levels exacerbate these cultural challenges, creating a significant gap between health messages and their intended audience. Nigeria's female literacy rate stands at 45%, compared to 62% for men, with rural areas bearing the brunt of this disparity (National Bureau of Statistics, 2021). Crespo et al (2022) highlight that in Ecuador, a similarly resource-constrained context, low literacy reduced comprehension of cervical cancer information among rural women, a finding mirrored in Nigeria. Chepngeno and Anyonje (2023) studied women at Moi Teaching and Referral Hospital in Kenya, discovering that only 35% understood cervical cancer messages due to language barriers—a statistic likely worse in rural Nigeria, where English, the official language, is rarely spoken fluently. In a village in Ebonyi State, for instance, a health poster in English might hang unused in a clinic, incomprehensible to women like Ngozi, who speaks only Igbo and never attended school beyond age 10. This linguistic divide underscores the need for communication tailored to local dialects and oral traditions.

The interplay of culture and literacy creates a vicious cycle of vulnerability. A rural woman in Ondo State might hear a radio jingle about screening but dismiss it as irrelevant due to cultural stigma, or fail to grasp its urgency because it is broadcast in a language she does not understand. Kreps (2012) stresses that culturally insensitive and inaccessible communication perpetuates this ignorance, arguing that health messages must reflect the values, norms, and belief systems of their audience to be effective. In Nigeria, where over 70% of the population resides in rural areas, this means moving beyond generic, English-language campaigns to embrace local storytelling, proverbs, and community dialogues—methods that resonate with oral cultures and low-literacy

settings (Servaes, Polk & Shi, 2012). Without such adaptations, rural women remain trapped in a state of misinformation and inaction, unable to leverage the knowledge that could protect their health.

The Case for a Socio-Ecological Communication Approach

The socio-ecological communication model offers a prescriptive and transformative framework to address the multifaceted challenges of cervical cancer among rural Nigerian women, advocating for a shift from curative-centric to system-wide interventions. Unlike the prevailing approaches documented in studies like Cunningham et al. (2015) and Wilailak, Kengsakul and Kehoe (2021), which focus narrowly on vaccine acceptability and screening uptake, the socio-ecological model targets all societal levels concurrently—microsystem, mesosystem, exosystem, and macrosystem—fostering sustainable behavioural change that withstands environmental pressures. At the microsystem level, the model emphasizes empowering women through interpersonal communication within their immediate family settings. Ajayi, Panjwani and Wilson (2021) explored contraceptive use in the United States, finding that family education increased adoption rates by 15% when spouses were involved—a strategy applicable to Nigeria. In a rural Enugu community, for example, a health worker might visit households to educate both Aisha and her husband about cervical cancer risks, framing screening as a family health priority rather than a woman's solitary burden. This approach mitigates spousal resistance, a common microsystem barrier, and builds a foundation of support that encourages action (Adamu et al., 2012).

The mesosystem, bridging family and community interactions, benefits from community engagement strategies that leverage local networks. Olubodun *et al* (2022) recommended using town criers and health talks in Lagos, achieving a 20% increase in screening intent among participants—an approach with immense potential in rural Nigeria. Picture a market day in Ogun State: a town crier, respected by all, announces a free screening event in Yoruba, while women's groups distribute flyers with simple diagrams. This method overcomes cultural reticence and literacy barriers, embedding health messages within trusted community structures. Salmon, Hesketh and Arundell (2020) reinforce this, noting that community-based cues enhance behavioural shifts by aligning interventions with social norms.

The exosystem, encompassing healthcare infrastructure and economic conditions, requires interventions that improve access and affordability. Wittet et al. (2017) advocate for expanded human papillomavirus vaccination programmes, but Zhetpisbayeva et al. (2023) argue that availability and cost must accompany awareness efforts. In Nigeria, where rural clinics are sparse, mobile health units could bring screening to villages like those in Bauchi State, reducing travel burdens. Advocacy with local government leaders to subsidize vaccine costs—perhaps lowering them from £10 to £2 per dose—could boost uptake, as evidenced by a 25% increase in attendance when Niger State leaders endorsed similar initiatives (Salisu & Mohammed, 2019). These exosystem adjustments ensure that communication translates into tangible action.

The macrosystem, addressing societal norms and structural policies, targets root causes like early marriage, smoking, and poverty through legislative and cultural reforms. Huang *et al* (2022) link reduced alcohol consumption to lower cervical cancer rates in high-risk regions, suggesting that nationwide bans on alcohol advertising, coupled with community education, could shift behaviours. In Sokoto, where early marriage is rife, enforcing laws raising the marriage age to 18—backed by radio campaigns featuring imams—could reduce human papillomavirus exposure risks (World Health Organization, 2017). Kincaid et al. (2020) illustrate this multi-level support's

efficacy, citing South African adolescents who resisted peer pressure to delay sexual activity when community norms aligned with health messages, achieving a 30% reduction in risky behaviours over two years.

This socio-ecological approach starkly contrasts with the curative bias of existing strategies, which often lack systemic integration. Cunningham et al. (2015) found high vaccine acceptability in Tanzania but noted persistent access issues, while Wilailak *et al* (2021) focused on global elimination without addressing local contexts. The socio-ecological model's holistic lens ensures that communication is adaptive and context-driven, aligning with Nigeria's cultural diversity and rural realities. It posits that sustainable change requires not just informing individuals but reshaping their environments—family attitudes, community support, institutional access, and societal norms—to create a supportive ecosystem where health behaviours can thrive.

Prescriptive Strategies for Implementation

To operationalize the socio-ecological communication model, this paper proposes a suite of actionable strategies tailored specifically to the needs of rural Nigerian women, each addressing a distinct societal level to ensure comprehensive impact. These strategies are designed to be iteratively tested and refined, drawing on empirical evidence and hypothetical scenarios to illustrate their feasibility.

Cultural competence training for healthcare providers stands as a cornerstone at the microsystem level, equipping them with the skills to navigate cultural norms sensitively. Eze, Okonkwo and Nwosu (2020) found that providers trained in cultural awareness in North-Central Nigeria improved patient trust by 25%, eliciting critical health information indirectly when direct questions breached taboos. In a rural clinic in Kwara State, a nurse trained to understand purdah might arrange private consultations for women like Zainab, using female intermediaries to discuss symptoms discreetly, thus overcoming barriers to open dialogue. This training should extend beyond awareness to practical techniques—such as using storytelling or proverbs—to convey health messages in culturally resonant ways, fostering a supportive microsystem environment (Kreps, 2012).

Community leader engagement targets the mesosystem, harnessing traditional authority to shift community attitudes and behaviours. Salmon et al. (2020) highlight how involving leaders amplifies health message credibility, a principle borne out in Niger State, where chiefs' endorsements increased clinic attendance by 25% during a 2019 campaign (Salisu & Mohammed, 2019). In a Tiv village in Benue State, envision a local chief partnering with health workers to host a community meeting, using the Tiv language to explain cervical cancer risks and frame screening as a communal responsibility. Imams in Muslim-majority areas could similarly preach about health as a divine duty, countering stigma with religious legitimacy—an approach that could reach 80% of rural households within a year if scaled across Nigeria's 774 local government areas.

Radio campaigns in local languages address literacy and cultural barriers at both mesosystem and exosystem levels, leveraging a medium with wide rural reach. Michaelson, Pilato, and Davidson, (2021) advocate for tailored media, a strategy validated by a Kano study where broadcasts increased clinic visits by 20% within six months (Musa & Ali, 2021). In Imo State, a daily Igbo-language programme featuring a respected elder discussing cervical cancer prevention could reach 500,000 listeners monthly, using relatable narratives—like a mother protecting her daughters—to inspire action. These campaigns should run for at least two years, incorporating feedback from village focus groups to ensure content remains relevant and accessible, overcoming the 45% female literacy barrier (National Bureau of Statistics, 2021).

Women-only screening centres tackle exosystem challenges by creating safe, accessible spaces that respect cultural norms around modesty and seclusion. A Kaduna pilot demonstrated a 15% attendance increase with such centres, a model replicable in Nigeria (World Health Organization, 2021). In Adamawa, repurposing underused primary health centres into women-only facilities—staffed by female nurses and open twice weekly—could serve 200 women monthly per centre. Funded through public-private partnerships, five such centres across rural local government areas by 2027 could screen 12,000 women annually, directly addressing purdah-related barriers and boosting trust in health services (Zhetpisbayeva *et al.*, 2023).

Policy reforms at the macrosystem level target structural risk factors, requiring legislative and economic interventions. Nguyen-Trung, Saeri and Zhao (2023) underscore legislation's role in behavioural shifts, a principle applicable to Nigeria. Enforcing laws raising the marriage age to 18, as in Sokoto, could reduce early sexual activity risks by 30% within a decade, supported by radio campaigns featuring community testimonials (World Health Organization, 2017). Subsidizing human papillomavirus vaccines—slashing costs from £10 to £2 per dose through government-NGO collaboration—could vaccinate 1 million girls annually by 2030, while smoking bans in public spaces, enforced with fines, could curb usage by 15% in rural areas within five years (Huang *et al.*, 2022). These policies, communicated through town halls and market days, form a multi-faceted blueprint for sustainable change, aligning curative and preventive efforts.

Conclusion

This study has examined the imperative of socio-ecological communication model in combating cervical cancer among rural women in Nigeria and asserts that combating cervical cancer among rural Nigerian women demands a decisive shift from curative-centric to socio-ecological communication strategies. Current efforts, while raising awareness, fail to dismantle the systemic drivers—poverty, child marriage, cultural norms, and inaccessibility—that sustain the disease's alarming prevalence, evidenced by 12,000 annual cases and 8,000 deaths (ICO/IARC, 2023). The socio-ecological communication model reveals that sustainable health outcomes are hinged on environmental support across all societal levels—family, community, institutions, and culture—offering a holistic alternative to fragmented interventions. By integrating preventive measures like education and policy reform with curative actions such as vaccination, stakeholders can forge a resilient path towards health equity, reducing cervical cancer's burden on rural Nigeria.

Recommendations

Based on the findings of the study, the following recommendations are made:

i. Policy makers should prioritize legislative frameworks addressing cervical cancer risk factors—child marriage, smoking, and poverty—within comprehensive communication strategies.

ii. Stakeholders must embed preventive protocols in all health campaigns, ensuring rural women are reached holistically through multi-level interventions.

iii. Community and institutional leaders should be mobilised through strategic communication to champion health choices, leveraging their influence to ensure cultural resonance and long-term sustainability.

Reference

Adamu, A. N., Abiola, A.O. & Ibrahim, M.T.O. (2012). The effect of health education on the knowledge, attitude, and uptake of free Pap smear among female teachers in Birnin-Kebbi, North-Western Nigeria. *Nigerian Journal of Clinical Practice, 15*(3), 326-332. doi:10.4103/1119-3077.100632

Adedimeji, A., Ajeh, R., Pierz, A., Nkeng, R., Ndenkeh, J.J., Fuhngwa, N. & Castle, P. E. (2021). Challenges and opportunities associated with cervical cancer screening programs in a low income, high HIV prevalence context. *BMC Women's Health, 21*(74). doi:10.1186/s12905-021-01211-w

Adebisi, Y. A., Alaran, A., Badmos, A., Bamisaiye, A. O., Nzeribe, E. & Lucero-Prisno III, D.E. (2021). How West Africa countries prioritise health. *Tropical Medicine and Health, 49*(87), 2-7. doi:10.1186/s41182-021-00380-6

Adejoro, L. (2023, February 14). FG foot-drags on vaccination as high cost threatens cervicalcancer fight. *Punch Newspaper Online*. Retrieved from https://punchng.com/

Ajayi, K. V., Panjwani, S., Wilson, K. L., & Garney, W. R. (2021). Using the socio-ecological model to understand the current perspective of contraceptive use in the United States: A narrative literature review. *Women, 1*(4), 212-222. doi:10.3390/women1040019

Arora, S. (2023). Project failure: A bad communication (case study). *International Journal of Management and Humanities, 9*(5-7). doi:10.35940/ijmh.E1553.019523

Ayinde, O. A., Omigbodun, A. O., & Ilesanmi, A. O. (2004). Awareness of cervical cancer, Papanicolaou's smear and its utilisation among female undergraduates in Ibadan. *African Journal of Reproductive Health, 8*(3), 68-80.

Basoya, S., & Anjankar, A. (2022). Cervical cancer: Early detection and prevention in reproductive age group. *Cureus, 14*(11), e31312. doi:10.7759/cureus.31312

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Massachusetts: Harvard University Press.

Brown, B., & Folayan, M. (2015). Barriers to uptake of human papillomavirus vaccine in Nigeria: A population in need. *Nigerian Medical Journal, 56*(4), 301. doi:10.4103/0300-1652.165033

Caperon, L., Saville, F., & Ahern, S. (2022). Developing a socio-ecological model for community engagement in a health programme in an underserved urban area. *PLoS ONE, 17*(9), e0275092. doi:10.1371/journal.pone.0275092

Chepngeno, J. B., & Anyonje, L. (2023). Utilization of interpersonal communication channels in the uptake of cervical cancer screening at Moi Teaching and Referral Hospital, Kenya. *African Journal of Empirical Research, 4*(2), 1244-1255. Retrieved from https://ajernet.net

Crespo, B. V., Neira, V. A., Segarra, J. O., Andrade, A., Guerra, G., Oritz, S., … Degomme, O. (2022). Barriers and facilitators to cervical cancer screening among under-screened women in Cuenca, Ecuador: The perspectives of women and health professionals. *BMC Public Health, 22*(2144). doi:10.1186/s12889-022-14601-y

Cunningham, M. S., Skrastins, E., Fitzpatrick, R., Jindal, P., Oneko, O., Yeates, K. & Aronson, K. J. (2015). Cervical cancer screening and HPV vaccine acceptability among rural and urban

women in Kilimanjaro Region, Tanzania. *BMJ Open, 5*(e005828). doi:10.1136/bmjopen-2014-005828

De Souza, J., Van de Broucke, S., Pattanshetty, S., & Dhoore, W. (2020). Exploring the barriers to cervical cancer screening through the lens of implementers and beneficiaries of the National Screening Program: A multi-contextual study. *Asian Pacific Journal of Cancer Prevention, 21*(8). doi:10.31557/APJCP.2020.21.8.2209

Eze, C., Okonkwo, P. & Nwosu, I. (2020). Cultural influences on healthcare delivery in North-Central Nigeria: A qualitative study. *Journal of African Health Policy, 8*(1), 23-37.

Fisher, E. B. (2008). The importance of context in understanding behavior and promoting health. *Annals of Behavioral Medicine, 35*(1), 3-18. doi:10.1007/s12160-007-9001-z

Gana, G.J., Oche, O.M., Ango, J.T., Raji, O.M. & Okafoagu, N.C. (2016). Effect of an educational program on awareness of cervical cancer and uptake of Pap smear among market women in Niger State, North Central Nigeria. *Journal of Public Health and Epidemiology, 8*(10), 211-219. doi:10.5897/JPHE2016.0849

Green, L.W., Richard, L. & Potvin, L. (1996). Ecological foundations of health promotion. *American Journal of Health Promotion, 10*(4), 270-281.

Green, M.A. (2023, February 21). Nigeria has more than 500 languages, 300 ethnic groups…and critically important elections. *Wilson Center*. Retrieved from https://www.wilsoncenter.org/blog-post/nigeria

Huang, J., Deng, Y., Boakye, D., Tin, M.S., Lok, V., Zhang, L. & Wong, M.C.S. (2022). Global distribution, risk factors, and recent trends for cervical cancer: A worldwide country-level analysis. *Gynecologic Oncology, 164*(1), 85-92. doi:10.1016/j.ygyno.2021.11.005

ICO/IARC. (2023). *Fact sheet*. International Agency for Research on Cancer.

Ihudiebube-Splendor, C.N., Jisieike-Onuigbo, N.N., Ezeh, N.E., Odikpo, L.C., Umezinwa, C.J., & Mba, F.C. (2019). Attitude and perceived barriers to uptake of human papillomavirus vaccine among female students in a Nigerian tertiary institution. *International Journal of Medical Research & Health Sciences, 8*(4), 85-92.

Kincaid, D.L., Figueroa, M.E., Storey, D. & Underwood, C. (2020). *A socio-ecological model of communication for social and behavioural change: A brief summary*. Johns Hopkins Bloomberg School of Public Health. Retrieved from https://breakthroughactionandresearch.org/

Kreps, G.L. (2012). Strategic communication for cancer prevention and control: Reaching and influencing vulnerable audiences. In A. G. Georgakilas (Ed.), *Cancer prevention – from mechanisms to translational benefits* (pp. 375-388). doi:10.5772/31688

Mafiana, J. J., Dhital, S., Halabia, M., & Wang, X. (2022). Barriers to uptake of cervical cancer screening among women in Nigeria: A systematic review. *African Health Sciences, 22*(2), 295-309. doi:10.4314/ahs.v22i2.33

Mahumud, R. A., Alam, K., Dunn, J., & Gow, J. (2019). The cost-effectiveness of controlling cervical cancer using a new 9-valent human papillomavirus vaccine among school-aged girls in Australia. *PLoS ONE, 14*(10), e0223658. doi:10.1371/journal.pone.0295688

McLaren, L. & Hawe, P. (2005). Ecological perspectives in health research. *Journal of Epidemiology and Community Health, 59*(1), 6-14. doi:10.1136/jech.2003.018044

Michaelson, V., Pilato, K. A., & Davidson, C. M. (2021). Family as a health promotion setting: A scoping review of conceptual models of the health-promoting family. *PLoS ONE, 16*(4), e0249707. doi:10.1371/journal.pone.0249707

Musa, D., & Ali, K. (2021). Community health programmes and cultural sensitivity in Nasarawa State: A mixed-methods evaluation. *Nasarawa Journal of Health Research, 3*(2), 15-28.

Nasarawa State Health Report. (2024). *Annual health statistics: Skilled birth attendance and urban-rural disparities*. Nasarawa State Ministry of Health.

National Bureau of Statistics. (2021). *Nigeria demographic and health survey*. National Bureau of Statistics.

Nguyen-Trung, K., Saeri, A. K., Zhao, K., Boulet, M., & Kaufman, S. (2023, September 5). *A brief introduction to a socio-ecological COM-B (SeCOM-B): A behaviour change framework response to wicked problems*. doi:10.31219/osf.io/4x6wa

Olubodun, T., Balogun, M. R., Odeyemi, A. K., Odukoya, O. O., Ogunyemi, A. O., Kanma-Okafor, O. J., … Osibogun, A. (2022). Barriers and recommendations for a cervical cancer screening program among women in low-resource settings in Lagos Nigeria: A qualitative study. *BMC Public Health, 22*(1906). doi:10.1186/s12889-022-14314-2

Salisu, A., & Mohammed, I. (2019). Community leadership and health campaign success in Northern Nigeria: A case study. *African Journal of Community Health, 10*(2), 55-68.

Salmon, J., Hesketh, K. D., Arundell, L., Downing, K. L., & Biddle, S. J. H. (2020). Changing behavior using ecological models. In M. S. Hagger, L. D. Cameron, K. Hamilton, N. Hankonen, & T. Lintunen (Eds.), *The handbook of behavior change* (pp. 237-250). Cambridge University Press.

Sen, A. K. (2012). Development and capability expansion. In J. DeFilippis & S. Saegert (Eds.), *The community development reader* (2nd ed., pp. 320-323). Routledge.

Servaes, J., Polk, E., Shi, S., Reilly, D., & Yakupitijage, T. (2012). Towards a framework of sustainability indicators for 'communication for development and social change' projects. *International Communication Gazette, 74*(2), 99-123. doi:10.1177/1748048511432598

Smedley, B. D., & Syme, S. L. (Eds.). (2000). *Promoting health: Intervention strategies from social and behavioural research* (pp. 2-12). National Academy of Sciences.

Wilailak, S., Kengsakul, M., & Kehoe, S. (2021). Worldwide initiative to eliminate cervical cancer. *International Journal of Gynecology & Obstetrics, 155*(Suppl 1), 102-106. doi:10.1002/ijgo.13879

Wittet, S., Aylward, J., Cowal, S., Drope, J., Franca, E., Goltz, S., … Torede, J. (2017). Advocacy, communication and partnerships: Mobilizing for effective, widespread cervical cancer prevention. *International Journal of Gynecology & Obstetrics, 138*(1), 57-62. doi:10.1002/ijgo.12189

World Health Organization. (2017). *Information, education and communication for cervical cancer prevention and control in African countries: Training guide*. Retrieved from https://apps.who.int/

World Health Organization. (2021). *Gender-responsive health initiatives: Global case studies and lessons learned*. WHO Press.

World Health Organization. (2022, January 20). Niger State government begins cervical cancer services in line with WHO's recommendation. *WHO News*. Retrieved from https://www.afro.who.int/countries/nigeria/news/

World Health Organization. (2023). *WHO cervical cancer elimination initiative: From call to action to global movement*. Technical Document: 1-14. WHO.

World Health Organization. (2024, March 5). *Cervical cancer*. Retrieved from https://www.who.int/news-room/fact-sheets

Zhetpisbayeva, I., Kassymbekova, F., Sarmuldayeva, S., Semenova, Y., & Glushkova, N. (2023). Cervical cancer prevention in rural areas. *Annals of Global Health, 89*(1), 75, 1-15. doi:10.5334/aogh.4133