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Cervical Cancer Control in Pakistan: A Narrative Policy Review of HPV Vaccination Rollout and Vaccine Hesitancy

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ABSTRACT

Cervical cancer claims more than 3,000 women in Pakistan each year, which makes it the third most prevalent cause of mortality among cancer patients among women of reproductive age. However, with the introduction of the Human Papillomavirus Vaccine, there is an opportunity for intervention. However, there are also challenges in the process of vaccine introduction due to mistrust among the population and cultural beliefs. The HPV vaccine campaign will target 13 million girls in Pakistan between the ages of 9 and 14. The bivalent Cecolin vaccine has been tested for safety and effectiveness. However, there is still mistrust among women in Pakistan due to cultural beliefs that the vaccine will cause infertility and immoral behavior. The fact that consent is needed from parents also provides an opportunity for ethical justification. The involvement of ulema in reframing the vaccine as a cancer vaccine, not an STD vaccine, is also significant. This study sought to analyze the scientific, legal, and logistical background of the first nationwide HPV vaccination campaign in Pakistan, which was launched in September 2025. Additionally, this study discussed the history of vaccine hesitancy in Pakistan, particularly in relation to the polio vaccination. Also, we analyzed what strategies have been effective in other Muslim-majority countries, such as Indonesia and Malaysia. The success of the HPV vaccination drive in Pakistan depends on addressing the issue of mistrust. The integration of the vaccine into the existing immunization program is also essential in eliminating cervical cancer.

INTRODUCTION

In Pakistan, about eight families daily lose a mother, daughter, sister, or wife to cervical cancer [1]. Cervical cancer is mostly diagnosed in the late stages, where not much can be done, and the prognosis is poor. A survivor of cervical cancer, Afshan Bhurgri, reports that her surgery, chemotherapy, and radiotherapy were a physical, emotional, and financial ordeal. She remembers that I would not want to go through what I did [2]. Her access to prevention changed as she made sure that her younger daughter was vaccinated after recovery. It used to require three costly injections back then, but now, a single injection will suffice, and it is free, she says [2]. This is a significant milestone in the development of the Pakistani population with respect to health. On September 15, 2025, the government, with the help of a global coalition, rolled out the first national Human Papillomavirus (HPV) vaccination campaign [1]. The campaign will reach 13 million girls between the ages of 9 and 14 years to decrease the cervical cancer burden, which claims more than 3000 lives every year among women in Pakistan [2]. This project is in line with the WHO global approach to eliminating cervical cancer, which has 907090 targets by 2030: 90 percent

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vaccination coverage, 70 percent screening coverage, and 90 percent treatment coverage [1]. The implementation is, however, done in an environment of societal mistrust, misinformation, and cultural sensitivities [1]. At the campaign launch, the Federal Minister of Health drew attention to the safety of vaccines and the need to take them, noting worries over misinformation and negative attitudes [1]. These problems indicate more general challenges of vaccine hesitancy and trust, which continue to be central to the failure in implementing preventive health programs in Pakistan.

Pakistan has few policy-based and empirical studies that focus on HPV vaccine rollout in cultural beliefs, misinformation, and vaccine hesitancy. Despite international evidence on HPV vaccination, there is a gap in localized research that investigates the issue of community trust and awareness, as well as effective communication in the context of Pakistani socio-religious environments. Although an efficient HPV vaccine is available, cervical cancer has become a significant problem in the Pakistani population, with its low awareness, cultural misunderstandings, and distrust towards vaccination campaigns. Such obstacles are barriers to a successful implementation and acceptance of the national HPV vaccination campaign. This study aims to assess the implementation of HPV vaccination in Pakistan and analyze the factors that influence its uptake, such as vaccine hesitancy, cultural beliefs, misinformation, and policy implementation. It will also seek to establish ways of boosting trust among the masses and increasing cervical cancer preventive measures.

The Science, Safety, and State Approval: The anatomy of a lifesaver

In the quest to formulate an opinion about the controversy over the HPV vaccine in Pakistan, it is paramount to get acquainted with the scientific and regulatory background of the said campaign. It is not a foreign experiment that has not been tested before, but a generally accepted medical instrument, which has been proven over decades and is approved by national and international regulatory bodies. This is the consensus that is core to countering the misinformation and is in agreement with global and national health authorities.

Virus to Vaccine – The Scientific Imperative

Human Papillomavirus (HPV) is among the most prevalent sexually transmitted diseases and the cause of all but one case of cervical cancer. The pressure in Pakistan is high. Approximately, there are 68.6 million women above 15 years and at risk [3]. It is the third-most common cause of cancer-related deaths in women, with over 5,000 women being diagnosed each year and over 3,000 women dying due to it [4]. It is estimated that HPV 16 and 18 cause about 88% of cervical cancer in Pakistan [3]. Live and dead viruses are not contained in HPV vaccines. They instead employ virus-like particles (VLPs), which are recombinant L1 protein, inducing immunity but are not infectious [5]. The national campaign is advertising Cecolin, a bivalent vaccine against HPV 16 and 18, with the WHO having prequalified it as safe and effective [6]. The HPV vaccines like Cervarix (GSK) and Gardasil (Merck) had been in the private sector for several years prior, with Gardasil also having the HPV 6 and 11, the two most common genital warts [3]. Other cancers linked to HPV infection include anal, penile, and oropharyngeal cancer in men and women. Broad-spectrum protection against several HPV-related malignancies and better protection have been demonstrated in nonvalent vaccines like Gardasil 9 [7].

Pakistan's Seal of Approval – The Regulatory Gauntlet

The perception that the HPV vaccine is a foreign experiment contrasts with Pakistan's regulatory system. The Drug. The attitude that the HPV vaccine is a foreign experiment is contrary to the regulatory system in Pakistan. Drug Regulatory Authority of Pakistan (DRAP) has a mandate to ensure the safety, quality, and effectiveness of all therapeutic products, including vaccines, by scientifically analyzing and approving them before use [8]. Quality control and batch release tests on all vaccines used in Pakistan are performed by the National Control Laboratory of Biologicals (NCLB) established by the DRAP Act of 2012 and the Drugs Act of 1976 [9]. No domestic regulatory clearance can allow the administration of any vaccine. This is one of the processes that are under-represented in the discussion of the issue, which leads to misinformation and conspiracy theories [10]. It derives additional credibility through its affiliation with the WHO National Control Laboratory Network of Biologicals (WHO-NNB), which facilitates adherence to the international standards [11]. Non-governmental organizations like the National Institutes of Health (NIH) and the University of Health Sciences at Dow (DUHS) are also helping to conduct HPV-related research and training [12].

The Global Consensus – A Decade of Data

HPV vaccination has a strong clinical and real-world evidence since its introduction in 2006. Its safety profile has been reaffirmed by the WHO Global Advisory Committee on Vaccine Safety on several occasions. Extensive UK, USA, Denmark, and Sweden studies indicate no causal effect of HPV vaccination in the Guillain-Barr syndrome, multiple sclerosis, or autoimmune disease. There is also no evidence of association with infertility or poor pregnancy outcomes [13]. The ongoing concerns held by the population are thus mostly non-scientific, such as

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cultural sensitivities and mistrust of institutions. Effectiveness in the field has proven to be successful. A Swedish cohort study of 1.7 million women was able to show up to a 90 percent risk decrease in cervical cancer in women vaccinated earlier than age 17 [14]. Other countries, such as Denmark, have shown similar results that prove the effectiveness of vaccines to prevent cancer [15]. Lastly, the WHO 2022 guideline of a single-dose schedule in girls aged 914 years has enhanced practicability and implementation barriers, particularly as the program can be scaled to large-scale campaigns like the ongoing one in Pakistan [16]. The paper provides an overview of the situation with HPV vaccination in Pakistan, which is characterized by variations in vaccine type, coverage of HPV strains, availability, and regulatory status. The national immunization program now employs the bivalent Cecolin vaccine, but wider-spectrum vaccines were in the private market a few years ago. This shows a valuable equity point in making HPV vaccination available to various socioeconomic groups (Table 1).

Table 1: The HPV Vaccine Landscape in Pakistan

Vaccine Name	Type	HPV Strains Covered	Availability in Pakistan	Regulatory Status
Cecolin	Bivalent	16, 18	Public Campaign (Free)	WHO Prequalified, DRAP Approved
Gardasil	Quadrivalent	6, 11, 16, 18	Private Market (Paid)	DRAP Approved
Gardasil 9	Nonvalent	6, 11, 16, 18, 31, 33, 45, 52, 58	Private Market (Paid)	DRAP Approved
Cervarix	Bivalent	16, 18	Private Market (Paid)	DRAP Approved

The Logistics of Hope: Deploying a Medical Revolution

Bringing the promise of the HPV vaccine to reality is a scale and complexity operation. The national campaign implementation in Pakistan is not simply the process of delivering vials; it is a social and logistical endeavor to vaccinate millions of adolescent girls in remote, various, and sometimes difficult locations. The campaign design, both with regard to human resources and consent policy, seems like a pre-emptive approach to counter expected cultural opposition.

The Campaign Blueprint – A Monumental Undertaking

The Government of Pakistan has ambitious targets. During the first year (September 1527, 2025), at least 90 percent of 13 million girls aged 914 years in Punjab, Sindh, Pakistan-Administered Kashmir, and the Islamabad Capital Territory will be immunized. The program will be extended to Khyber Pakhtunkhwa by 2026, and Balochistan and Gilgit-Baltistan by 2027, and will eventually reach over 17 million girls countrywide. The ultimate objective is to be integrated into the Expanded Program on Immunization (EPI), and thus make HPV vaccination a routine practice among 9-year-old girls. Practical constraints have been implemented in a multi-pronged delivery strategy. It is estimated that close to fifty percent of the target age group (girls) are out of school, and hence need a flexible delivery strategy. The girls are immunized in schools and madrassas by the use of vaccination teams and regular access to the fixed health facilities. Mobile and special outreach teams are used to reach the high-risk groups such as flood-affected communities, nomads, and urban slums [1]. There is support of more than 49,000 trained health workers [17] to support the campaign. This is a culturally suitable move because all the vaccinators are women, so that social friction is minimized [2]. Over 14,000 field workers are deployed in teams of vaccinators, assistants, and social mobilizers in Sindh alone, under the leadership of health officials who have undergone training on how to handle adverse events following immunization (AEFIs) [17]. Inclusion of social mobilizers is indicative of the fact that it is not merely a public health intervention but also a communication challenge.

The Global Alliance – A Double-Edged Sword

The Federal Directorate of Immunization supports the campaign with the assistance of international partners, such as Gavi, the Vaccine Alliance, which is involved in vaccinating adolescent girls in low-income countries. The WHO prequalifies vaccines and supports the training of health workers [1]. The Bill and Melinda Gates Foundation has funded evidence generation on single-dose efficacy and collaborated with Innovax, the producer of Cecolin, to fund proof of affordable supply of vaccines [18]. Although international cooperation is crucial, it also leads to distrust. Apparent participation of international donors can further support conspiracy theories in situations where polio vaccination efforts have already been linked to Western intervention. This perception is further enhanced by the fact that the CIA used a fake vaccination campaign in the Osama bin Laden operation [19]. Though the logos of WHO, UNICEF, and Gavi are supposed to be the signals of credibility, they can be interpreted as external control. Gavi co-financing can enhance sustainability, yet in the short run, foreign dependence is a cause of public distrust [2].

The Consent Mandate – An Ethical Imperative and Logistical Nightmare

The campaign against HPV assumes informed consent, unlike the elements of polio eradication campaigns. No vaccination of a girl is done without written parental permission in Punjab. Schools hand out and take back

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consent forms in advance of the arrival of vaccination teams. Such a strategy will address the autonomy of parents, especially since cultural sensibilities about the vaccine are sensitive [20]. This requirement, however, places a logistical constraint. The large number of consent forms reported by health workers and teachers has led to delays and decreased campaign efficiency and coverage targets [21]. Difficulties are more in the illiterate region and out-of-school girls, making it a major task to mobilize them door to door. A Lahore teacher reported a rejection of the vaccine by parents [22]. This free-of-charge model is opposed to the polio vaccination campaigns, which have employed enforcement measures in certain instances. The difference is significant: the use of coercion in polio and persuasion in HPV vaccination. This is indicative of a realization that adolescent female vaccination should be approached using other ethical and social approaches, but it also underscores the development of public health ethics.

The Echoes of the Past: Battling Myths in a Climate of Mistrust

The HPV vaccine introduction is not a vacuum; it fits into a pre-existing context of mistrust towards vaccinations, which has been formed over decades of experience with the polio eradication campaign. The misinformation about the HPV vaccine is therefore not incidental but adds to the existing concerns and distrust. The dilemma of health authorities is not to tell the right story, but to refute the competing stories.

The Long Shadow of the Polio Campaign

The biggest challenge to immunization programs is the legacy of the polio eradication campaign. Decades of success in trying to eradicate the disease have been met with suspicion, violence, and conspiracy theories, and are now being transferred to other health initiatives. One of the most notable was the 2011 discovery of a CIA operation in which a fake hepatitis B vaccination campaign was used in Abbottabad to harvest DNA samples in the hunt against Osama bin Laden [23]. This occurrence strengthened conspiracy theories that vaccination programs funded by the West are not health programs, but surveillance or sterilization. It had led to violence against polio workers, with many having been assaulted or killed by militant groups who view them as foreign agents [24]. This culture of distrust has now been transferred to new immunization programs like the HPV campaign. False finger marking and pressure to inflate vaccination coverage information have also been some of the other operational problems in polio programs [25].

Deconstructing the Propaganda – Infertility, Immorality, and Injury

The problem of misinformation concerning the HPV vaccine is not just a continuation of distrust of polio; it is more gender-specific. It capitalizes on cultural sensitivities on sexuality, fertility, and reproductive health in a patriarchal society. Fear of infertility is the most frequent issue that is raised at awareness events [2]. The other myth is that the HPV vaccination is morally wrong as it is associated with sexually transmitted infections. This is put in two perspectives: first, that good girls do not require it because of the anticipated abstinence before marriage, and second, that vaccination stimulates sex. Such beliefs put parents in a dilemma between perceived ethical issues and long-term health security in the long-term. Besides these issues, active misinformation campaigns have also been witnessed. In the initial stages of the September 2025 rollout, there was a viral video of terrified schoolgirls on social media with claims that it was due to forced vaccination that they were becoming ill [26]. In fact-checking, it was revealed that the video was, in fact, showing schoolgirls who were victims of tear gas during protests in Azad Jammu and Kashmir in May 2024 [27]. The recontextualization of this video underscores the purposeful efforts to diminish the impact of vaccination with misinformation.

The Awareness Abyss and the Culture of Silence

The awareness is also low, and the campaign is being carried out. A Knowledge, Attitudes and Behaviors survey commissioned by Jhpiego across the country and involving almost 5,000 caregivers revealed that there was a low level of awareness about HPV and its vaccine. The results were characterized as sobering [28], but they showed an information gap instead of organized vaccine resistance. Awareness Gap: Public Perception vs. Public Health Reality is outlined [28]. The paper reveals an awareness gap about cervical cancer and HPV in Pakistan that is critical. Even though 19% of the caregivers have heard about cervical cancer, HPV, and its preventive vaccine are barely known (5% and 2% respectively). There is limited awareness of HPV as the cause (9% of those who are aware of cervical cancer). In general, the results suggest that the lack of background awareness seems to be the more important cause of the low vaccination rates in the population than informed hesitancy, with the focus on the importance of a significant information gap, rather than active rejection (Table 2).

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Table 2: The Awareness Gap: Public Perception vs. Public Health Reality

Survey Finding	Percentage Reported
Caregivers who have heard of cervical cancer	19%
Caregivers who have heard of HPV	5%
Caregivers who know a vaccine exists to prevent it	2%
Caregivers who correctly identify HPV as the cause of cervical cancer	9%

Note: The 9% figure is among the small subset of caregivers who had heard of cervical cancer

This lack of baseline knowledge is also confirmed by several smaller studies [2]. But this lack of information is not a passive state. Instead, it is a disputed territory, according to pediatrician Dr. Fyezah Jehan: No information is superior to wrong information, and it is an opportunity to influence the narratives by the health authorities with accurate information in the first place. She further warns of misinformation soon filling this vacuum as soon as the campaign launches. This is indicative of a high-stakes race between organized, top-down communication and government and the spread of misinformation faster and more emotionally on social media and networks [29]. To make this even more difficult, there is a cultural silence on sexual and reproductive health within Pakistani society. This taboo restricts the free discussion and puts health authorities in a strategic bind. To prevent isolating different members of the society, the HPV vaccine is being mainly sold as a preventive measure against cancer, without mentioning its effects in preventing sexually transmitted infections [27]. Although practical, this solution leaves misconceptions unaddressed, and moral issues may still linger and re-arise to question vaccine acceptance [30].

Forging a Path Forward: Faith, Community, and the Road to Elimination

However, crossing this complex terrain of mistrust and cultural sensitivity in Pakistan is not only about logistical expediency and scientific evidence. The success of the HPV vaccine rollout will depend on a sophisticated approach to community engagement and building alliances with trusted voices in Pakistan. By learning from past public health failures and drawing lessons from successful models in other Muslim-majority countries, Pakistan is attempting to develop a pathway toward cervical cancer elimination [31].

Engaging the Ulema – The Indispensable Alliance

With the socio-religious background of Pakistan, the opinion of a respected religious scholar (alim) can sometimes be more persuasive than that of a government leader or a medical expert. The history of the polio campaign has demonstrated repeatedly that, in the absence of the backing of religious leaders, it will hardly be possible to overcome the resistance of conservative groups. This is important in their role in framing vaccination within an Islamic context to be accepted [32]. In line with this, engaging with the ulema has been one of the focal points of the HPV advocacy strategy [33]. Health advocates and civil society groups have been holding dialogues and workshops with religious scholars to gain support for HPV vaccination. One of the most important things about this engagement has been the change in framing whereby prevention of an STI has been replaced by prevention of cancer [34]. This makes the vaccine desexualized and shifts the debate on issues of sexuality to the mainstream Islamic value of safeguarding health and life. It is argued that Islam places a lot of emphasis on health preservation, and religious leaders in other countries, like Saudi Arabia, Malaysia, and Indonesia, have given approval to it. One possible result of this activity might be a formal acceptance or fatwa of the Council of Islamic Ideology (CII) that counsels the legislature of Pakistan on Islamic conformity [35]. Even though this ruling has not been issued yet, analysts believe that working with the CII is one of the most important measures to overcome such misconceptions and to ensure high religious approval, lessening one of the greatest sources of opposition.

Lessons from the Region – Models for Success

Pakistan is not the only country that has to balance the administration of public health in the religious and cultural spheres. There are other examples of successful HPV vaccination programs in other Muslim-majority countries. In 2023, Indonesia, the most populous Muslim nation in the world, initiated its national HPV vaccination programs with pilot programs that reached high coverage of over 90 percent [36]. One of the factors was high political determination and alignment among the Ministry of Health, the Ministry of Religious Affairs, and the Ministry of Education [37]. Involvement with the Indonesian Ulema Council (MUI) to discuss the issues regarding halal status and moral acceptability was also important [38]. This guaranteed religious approval and reinforced faith. One of the lessons is the significance of inculcating health messaging into socio-religious frameworks and not isolating it [39]. Likewise, Malaysia has a free, voluntary HPV vaccination programmed against 13-year-old girls in place since 2010 [40]. The program has recorded coverage rates of more than 80 with implementation with parental consent making the country on course to eradicate cervical cancer [40]. The Malaysian model shows that it can be integrated with HPV vaccination into the regular national immunization systems to make it sustainable in the long run [41].

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Beyond the Jab – A Holistic Vision for Women's Health

Although the HPV vaccine is a significant primary prevention tool, it is not the only element in the control of cervical cancer. It is not responsive to the needs of millions of women who are over the age of vaccination. Protection is based on screening and early treatment for about 68.6 million women who are over 15 years old [4]. The WHO 907090 plan focuses on 90 percent vaccination, 70 percent screening with high-performance tests at 35 and 45 years, and 90 percent treatment of pre-cancer or cancer [42]. Screening coverage in Pakistan is very low, with research showing a rate of about 2 percent, and a lack of awareness of Pap smear testing [43]. Experts point out that the success of the vaccination program depends on the development of the screening and treatment infrastructure [44]. In the absence of this, several cases will still be diagnosed at advanced stages when the treatment is less effective and expensive. The advantages of the long run are great. According to epidemiological projections, over the next several decades, the number of cervical cancer cases that will be prevented with high coverage of vaccines is more than 100,000 cases [45]. In addition to health, the program is very cost-effective because it saves families and the health system a lot of money in terms of long-term treatments, and prevents a severe financial impact on the family and the health system. Above all, it is an investment in the health of women, which will allow them to live healthier and more productive lives.

Study Limitations and Future Recommendations

The research is policy-based and narrative, without primary quantitative information and statistics. It depends on secondary sources that can be biased or restricted in generalization. As well, the performance of the HPV campaign and reactions of the community are not evaluated in real-time. Large-scale quantitative and community-based studies to determine the level of vaccine acceptance and outcomes should be included in future research. The control of HPV vaccination must be directed towards public health approaches, including awareness campaigns, religious leaders' involvement, bolstering trust, and incorporating HPV vaccination into screening programs to achieve lifelong control of cervical cancer.

CONCLUSIONS

The HPV vaccination program implementation in Pakistan is a significant milestone in the history of public health and a challenge to whether Pakistan can rise above historical suspicion, become health-conscious towards women, and the future generation. Its triumph rests on the need to counter misinformation and enhance trust in the community. In one case, proper engagement results in acceptance and eventual decrease in cervical cancer. In a different one, fear and misinformation inhibit uptake, leaving many girls unprotected. At the end, it will be decided by the trust and communication of the people and the community level.

Authors' Contribution

Conceptualization: MIS
Methodology: MIS
Formal analysis: HRS
Writing and Drafting: MIS, FF, HRS, SNS, AA
Review and Editing: MIS, FF, HRS, SNS, AA

All authors approved the final manuscript and take responsibility for the integrity of the work.

Conflicts of Interest

The authors declare no conflict of interest.

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