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**Barriers to HPV Screening and Prevention in Latin America: A systematic Review**

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Augsburg University Master of Science Physician Assistant Studies Program  
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## **Abstract**

In Latin America, cervical cancer is the second most common female cancer and the fourth most leading cancer of women around the world, with an estimated 342,000 deaths in 2020.<sup>1</sup> This systematic review of literature gives insight into Latin Americas barriers to Human Papillomavirus Virus (HPV) screening and prevention. A comprehensive literature review was conducted using google scholar, the WHO, and the CDC. Search terms included: barriers to HPV screening, cervical cancer, Latin America, Central America, Costa Rica, Prevention of HPV, and Human Papillomavirus. Three main barriers to HPV screening and prevention were found including, fear, lack of education, and access to care. In 2020 the World Health Assembly adopted the “Global Strategy towards eliminating cervical cancer,” proposing specific targets that countries must meet by 2030. This strategy includes goals such as having 90% of girls vaccinated with the HPV vaccine by 15 years old, 70% of women screened by 35 years old, and 90% of women with cervical cancer receive treatment.<sup>1</sup> More research is needed to help implement screening and vaccination programs in low-income Latin American countries.

## **INTRODUCTION:**

Cervical cancer is the fourth leading cancer of women, with around 604,000 new cases in 2020, with an estimated 342,000 deaths from cervical cancer in 2020.<sup>1</sup> 90% of these deaths occur in low- and middle-income countries.<sup>1</sup> This literature review aims to define the barriers to HPV screening and prevention throughout Latin America and describe the solutions for better healthcare access. To answer this research question, this literature review will first provide a brief historical review of the Human Papillomavirus Virus. Human Papillomavirus (HPV) types (16 and 18) are responsible for more than 95% of cervical cancers worldwide.<sup>1</sup> According to the CDC, HPV is the most common viral infection of the reproductive tract, and nearly all cervical cancers is attributed to an HPV infection. HPV is the most common Sexually transmitted infection, and some types can cause genital warts and cancers. HPV is most commonly spread during vaginal or anal sex and through skin-to-skin contact during sex. HPV can cause cervical cancer, including cancers of the vulva, vagina, penis, or anus. HPV can also cause cancer of the throat, called oropharyngeal cancer. The reasons listed above are why HPV prevention is crucial to improving the health of communities via HPV vaccination. This literature review will answer the research question to what barriers are currently present in Central and Latin America that pertain to HPV and cervical cancer screening and prevention. This research question will be answered by finding the three main barriers to screening and prevention. Answering this question is vital to optimize care and decrease cervical cancer mortality rates in low income countries.

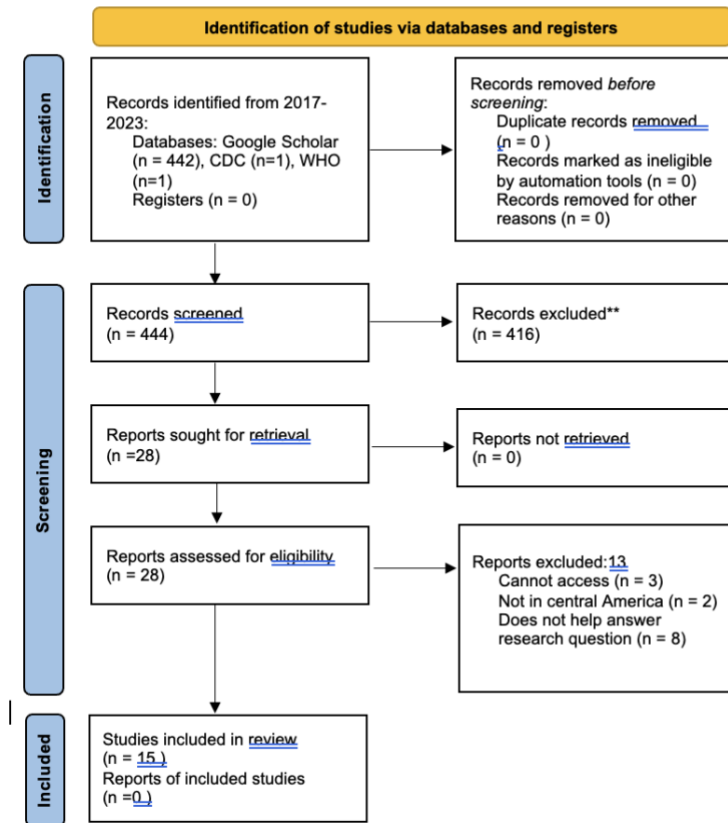
To better understand the approaches and barriers to HPV prevention, this systematic literature review will first provide a background of preventive medicine in Central America followed by the current barriers to HPV prevention. Then a discussion pulling in additional approaches and barriers seen in Central American preventive health overall will be connected to HPV prevention to better understand the barriers to HPV prevention in Central America.

Recommendations for next steps and future research surrounding HPV prevention will be presented.

**METHODS:**

A systematic review, using Prisma 2020 as a framework was conducted to answer the research question. A review of the current literature was conducted utilizing google scholar, PubMed, the WHO and the CDC. Inclusion/exclusion criteria: articles from 2017-2023, English only, Central and Latin American health systems.

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



**Search Terms:** Barriers to HPV screening, Cervical cancer screening, prevention of HPV, Human Papillomavirus, Latin America, Central America, Costa Rica HPV.

## **RESULTS:**

### **Preventative Care**

The CDC recommends HPV vaccinations for all preteens, including boys and girls at ages 11 or 12 years old. Currently, there are no tests to determine a person's HPV status, or a test approved to find HPV in the mouth or throat. There are screening tests for cervical cancer available. In 2020 the World Health Assembly adopted the "Global Strategy towards eliminating cervical cancer," proposing specific targets that countries must meet by 2030. This strategy includes goals such as having 90% of girls vaccinated with the HPV vaccine by 15 years old, 70% of women screened by 35 years old, and 90% of women with cervical cancer receive treatment.<sup>1</sup> The WHO works with countries to help implement comprehensive programs. Despite these programs, barriers remain present and will be discussed next.

In the 1960s widespread implementation of pap smear test was integrated into High income countries with a decreased incidence of cervical cancer by 60%.<sup>8</sup> However in Low-income countries, such as those in Latin America, have had limited success for a variety of reasons. Factors include limited screening programs, and timely treatment and follow up care. Limited knowledge concerning HPV and HPV related diseases is a barrier to achieving widespread vaccine uptake<sup>8</sup>.

### **Specific Approaches to HPV Prevention in the Literature**

Cervical cancer is the second most common female cancer in Latin America. Latin America and the Caribbean have some of the highest cervical cancer incidences globally.<sup>12</sup> Costa Rica alone has the third highest incidence of cervical cancer, and 38% of cervical cancer deaths occurred in women younger than 50.<sup>12</sup>

HPV vaccines used around the world include a bivalent vaccine (Cervarix, GSK, Belgium) that protects against types 16/18 of HPV and the quadrivalent vaccine (Gardasil, Merck, USA) protects against type 6/11/16/18.<sup>8</sup> In 2016, twelve Latin American countries had introduced HPV vaccines into their national immunization program.<sup>8</sup> Puerto Rico introduced a program in 2006, and Panama in 2008.<sup>8</sup> Many countries in Central America and Latin Caribbean lingered behind, including Costa Rica, Cuba, El Salvador, Haiti, and Nicaragua.

The Latin America region has vaccinated around 17 million girls aged 10-14 and reduced mortality by almost 100,000 from cervical cancer.<sup>8</sup> Countries that lag in HPV vaccinations are of great concern for cervical cancer rates in populations that would hugely benefit.<sup>8</sup> Cervical cancer rates are increased in women with lower socioeconomic status due to a lack of health care services for screening, diagnosis, and treatment.<sup>8</sup>

Data from 19 Latin American countries were collected, including the year of HPV vaccination implementation, gender and age targets, and number of doses in the program. The decline in adherence mainly regards the second dose for several factors, including limited knowledge of HPV, safety concerns, cost, cultural barriers, and the Covid19 pandemic.<sup>10</sup> As of 2022, three countries, Cuba, Venezuela, and Nicaragua, have not introduced the HPV vaccine for public health.<sup>10</sup> Mexico was the only country to meet its target, with 90% of girls fully vaccinated by age 15.<sup>10</sup> One concerning trend with HPV vaccinations is adherence to getting the second dose.

Mortality trends give an important insight to current worldwide screening improvements while also highlights countries where there is more work to be done. Torres-Roman JS et al. studied mortality data from cervical cancer obtained from the World Health Organization database. Mortality rates per 100,000 women were estimated aged 20-44 years old using the

standard population of 16 countries and territories in Latin America from 1999 to 2017. Joint point regression models were used to identify significant changes in mortality trends. Between 2014-2017 significant decreases in cervical cancers were observed in Chile (-2.4%), Columbia (-2.0%), Cuba (-3.6%), El Salvador (-3.1%), Mexico (-3.9%), Nicaragua (-1.7%), Panama (-1.7%), and Peru (-2.2%). Increases were seen in Brazil (+0.8%) and Paraguay (+3.7%).<sup>14</sup>

Cervical cancer mortality trends from 1997 to 2030 for 16 Latin American countries were predicted. Argentina, Brazil, Paraguay, and Venezuela will show continuous upwards trends in cervical cancer by 2030. Nicaragua, Panama, and Peru presented downward trends to 2030. Paraguay, Venezuela, and Argentina are not predicted to have a further decrease in cervical cancer rates by 2030.<sup>14</sup> This study was conducted because of a lack of research in the Latin American region. Cervical cancer mortality rates in Latin America are higher than in European countries. Paraguay and Venezuela reported mortality rates above 7 per 100,000, while rest of LAC showed rates above 2 per 100,000. One potential reason for this high prevalence of HPV is the high-risk serotypes (16,18) seen in Paraguay (71.5%) and Venezuela (95%).<sup>14</sup> These countries have one of the highest HPV incidence rates worldwide, which may explain the high mortality rates seen in the data. Other factors for increased mortality are social inequalities, low income, and difficulty accessing necessary health care. This research showed that Argentina, Brazil, Chile, and Costa Rica had an initial downward trend followed by a significant upward trend of mortality, likely due to better identification of the cause of death.

Decreasing mortality rates can contribute to developing and implementing public health programs and community interventions against cervical cancer. Effective detection followed by treatment can explain this reduction of cervical cancer mortality in the remaining Latin American countries. By 2030 mortality is still seen to increase in some countries due to population



increases and infrastructure. This shows the importance of preventing cervical cancer via vaccinations and the implementation of public health programs in the region for young women.

According to the CDC, the most effective way to prevent HPV is to get vaccinated (both girls and boys) and get screened for cervical cancer. Routine screening for women starts at age 21 and goes until 65 to help prevent cervical cancer. For those who are sexually active, condoms should be used every time someone has sex because this can lower their chances of getting HPV.

Overall, implementation strategies include school-based vaccination programs, health provider recommendations, vaccination coverage in Latin American countries, and more education on HPV information.<sup>2</sup> Many countries are implementing the needed medical care and HPV treatments for their citizens, but some countries still fall short. Similar to overall preventive strategies seen in the literature, barriers to HPV prevention were clearly evident.

### **Specific Barriers to HPV Prevention in the Literature**

In the literature, there are three main barrier themes to HPV prevention in Latin America. These themes include: fear, lack of education, and access to care. Each barrier will be examined and then lead to the discussion.

#### **FEAR**

Fear is a significant barrier to HPV prevention and screening found in the literature and is correlated to the second point of this review with lack of education. Cordoba-Sanchez et al. study in Colombia implemented a school-based HPV vaccination program in 2012 of a 3-dose series for nine-year-old females. Due to a mass psychogenic response after receiving the vaccination, rates dropped from 80% in 2012-2013 to a shocking 5% in 2016.<sup>2</sup> Main barriers to vaccine uptake are fear of adverse effects and fear of needles in the young girls in this population.<sup>2</sup> Improving HPV rates in Colombia require education programs and public media information. A

lack of information could have contributed to the general mistrust in vaccines and could have played a role in the event. This qualitative study was conducted between September 2016 and February 2017. The sample consisted of 49 girls and their 58 parents or guardians.<sup>2</sup> 11 out of 58 parents believed cervical cancer was caused by sexual intercourse.<sup>2</sup> Girls with higher socioeconomic status stated the vaccine was the best form of cervical cancer prevention, while girls with lower status mentioned hygiene as the best prevention. This information shows that lower-income girls have limited knowledge and awareness about their susceptibility.<sup>2</sup> The main barrier in this study for parents not vaccinating their daughters was the fear of adverse side effects.<sup>2</sup> For girls, the fear of needles was the main barrier.<sup>2</sup> Female parents and girls perceived cervical cancer susceptibility to be higher and HPV to be less, suggesting a vague understanding of the etiology of cervical cancer in this population.<sup>2</sup> Parents also believe the HPV vaccine would increase adolescent promiscuity and sexual activity.

### **LACK OF EDUCATION**

Santamaría-Ulloa et al. used the Costa Rica Households National Survey, representing 13,400 households with a subsample of women ages 20 to 69 who answered the Pap smear Module questionnaire (n=11,709).<sup>12</sup> This study focused primarily on two populations of women: those who have never had a pap smear and those who have had a pap smear five or more years ago. This study found that education is significantly associated with pap smear screening participation.<sup>11</sup> Women who did not complete primary education were more likely to never have a pap smear at 7% (98 out of 1464).<sup>12</sup> While women with higher education and college degrees, only 2% (76 out of 3118) have never had a pap smear.<sup>12</sup> Women with lower education status have lower rates of screening due to economic factors, lack of HPV knowledge, and also fear and shame.

Lack of education was also found in a discrepancy in staff knowledge and parental awareness. Llavall et al. used a qualitative study conducted in Iquitos, Peru, evaluating eleven Nurses and ten teachers involved in delivering HPV vaccination programs. This study aimed to gain insight into HPV perceptions. This study found that participants had good knowledge about the HPV virus but highlighted the need for more staff training.<sup>7</sup> Participants acknowledged a lack of parental knowledge as a barrier to vaccination and felt many parents could not make informed and educated decisions for their child receiving the vaccine.<sup>7</sup> These professionals also noted a need for more information sessions at a national level, and providing brochures to parents may help. However, the consensus agreed that school registration would be the best time to inform parents because they must attend school to enroll their children.<sup>7</sup> Another significant barrier is cultural beliefs about receiving vaccinations.<sup>7</sup>

Cervical cancer is the second leading cause of cancer death for women in the Dominican Republic. The purpose of this study was to explore barriers to the implementation of HPV vaccination in the Dominican Republic. Liebermann et al. focus on the parent-level barriers with six focused groups (N=64) with school-aged children's parents. Barriers found were low-moderate knowledge of HPV and cervical cancer, especially in rural and suburban groups, cost, and lack of public awareness of the vaccine.<sup>5</sup>

## **ACCESS**

Guatemala's rates of cervical cancer are 6x higher than the United States.<sup>4</sup> Barriers to screening include cultural, logistical, cost, and limited amount of highly trained professionals.<sup>4</sup> There is also a reported lack of laboratory technicians to read test results, and low access to screening in clinics. Despite Guatemala's work to improve its medical infrastructure, studies show that less than 50% of women receive screening for cervical cancer.<sup>4</sup> Women not only also struggle to receive screening but also find it

challenging to access follow-up care. The main reason for high cervical cancer rates in Latin America is the lack of access to screening.<sup>4</sup> Other factors for low screening rates include embarrassment, fear of pain, cultural beliefs, and lack of education.

Another study by Gottschlich et al. used survey data from ENSMI with 15,317 Guatemalan women ages 24-49. This data was collected to help developing countries analyze data to provide health indicators. 63.7% of women reported prior screening, which decreased in rural populations, with only 57.5% reported screening.<sup>4</sup> Women in urban areas are more likely to receive screening than those in rural areas. Indigenous women in the overall population were more likely not to be screened. Women with higher education and socioeconomic status were more likely to be screened across populations. Women who are married also reported higher rates of screening. Knowledge of cervical cancer was lower in rural and indigenous populations, and those who have knowledge of screening were more likely to get screened. According to this study, the cost was the most significant reported barrier to screening, with over 60% of each group reporting this, and distance of travel was reported by 35% as the largest barrier.<sup>4</sup> Women in rural and indigenous populations reported more barriers than those in urban areas.

This study has three essential findings. First, there is a high knowledge rate of cervical cancer and screening; however, rates of getting screened remain low. Women from rural and indigenous populations are less likely to get screened even if they are educated on screening compared to other urban areas. Knowledge and education alone may not be sufficient alone to improve screening rates. Second, barriers to health care such as parental permission, cost, and traveling distance, are significantly associated with screening. Lastly, women who speak a different language than their health providers are less likely to get screened. Demographic factors also impact screening, seeing that women living in urban areas, being

literate, non-indigenous, and having higher socioeconomic status correlate directly with higher screening rates.

Costa Rica has a universal health care system with a public and private sector. Caja Costarricense del Seguro Social, Costa Rican Social Security Fund (CCSS) was developed in 1941. In 2020, the number of immigrants in Latin America reached 42.9 million, equal to 6% of the general population and 12% of the population in Central America.<sup>15</sup> Generally, the government still needs to prioritize healthcare for these immigrants. Costa Rica is one of Latin America's most critical immigrant-receiving countries, with most immigrants coming from Nicaragua, Colombia, and El Salvador.

In 2018, Nicaragua started facing great political unrest, which led to an enormous influx of immigrants into Costa Rica. The law requires people to have legal residents to enroll in health insurance, excluding irregular and undocumented immigrants. CCSS requires foreigners to present a national or residence ID or a work permit to indicate they are in the regularization process. Regular immigrants can legally have health insurance, while irregular and undocumented immigrants are excluded. Costa Rica's migration and social policies make regularization complicated. The catch is that to gain health insurance, one would need regular immigration status, but to obtain this status, one must have health insurance. This is a significant barrier for immigrants to access health care in Costa Rica.

Many Costa Rican immigrants work in the informal sector of the economy, which makes access to insurance harder, and they may have to resort to voluntary insurance. Voluntary insurance leads to greater costs of US\$50-\$85 a month on a minimum wage job, and on top of that, costs for a prolonged stay in Costa Rica can be between US\$370 – US\$800.<sup>15</sup> These costs

are a high barrier for all immigrant groups. This study also notes how immigrants, primarily from Nicaragua, face discrimination and xenophobia, resulting in poor care at different healthcare services. Access to public health care is a fundamental human right for anyone in the world, and even in countries with universal health care systems, it has limitations. Healthcare access deeply depends on migration status, employment, and ability to pay for costs.

In summary, according to the literature the three biggest barriers to HPV prevention include: fear, lack of education, and access to care.

## **DISCUSSION**

### **FEAR**

According to Cordoba-Sanchez et al., fear of needles and adverse side effects were the main barriers to vaccine uptake. Girls in this study mentioned how they received little to no education on the vaccine before administering it. Due to Colombia's mass psychogenic response to the vaccine in 2012-2013, many families avoided the vaccine in later years because of fear of side effects. Fear of vaccinations directly correlates to a general lack of education. Santamaría-Ulloa et al. also mentioned fear as a reason for low screening rates in women with lower educational status. This may be due to fear of the screening process and the lack of information on pap-smear procedures. Women may feel that pap smears are invasive, awkward, and cause pain.

Proper staff training on vaccination side effects should be a part of mandatory training. According to the CDC, expected side effects include pain, redness, swelling at the injection site, fever, dizziness, headache, fatigue, and muscle or joint pain. Knowing these usual side effects can help patients feel more comfortable and be able to identify when side effects are abnormal. Fears of adverse side effects can be minimalized with the necessary education to HPV recipient

populations. Fears can also be decreased with proper staff training programs and increased parental education.

Although many studies addressed fear and adverse side effects as the main barrier to HPV vaccinations, more research is needed to investigate this barrier further and how to prevent fears in different communities and cultural backgrounds. Increasing the uptake of HPV prevention can be done with education programs. General fears to HPV vaccine uptake are directly related to poor education programs. Addressing these fears is one of the first steps to increasing HPV vaccine implementation and screening.

### **LACK OF EDUCATION**

Almost every study addressed the lack of education to be a significant barrier to HPV prevention in Latin America while struggling to mention the necessary changes that are needed to improve this issue. In this review, many studies also mention how cultural barriers impact prevention while not going into depth about what these cultural barriers include. One cultural barrier mentioned was the fear of promiscuity (Cordoba-Sanchez et al.). Parents believed HPV vaccination would increase the sexual promiscuity of their daughters. This fear of promiscuity is due to a lack of education about the purpose of the HPV vaccination and how it prevents cervical cancer. More parental education is necessary to protect young girls from cervical cancer while reassuring parents that the vaccine does not protect against other STDs or increase promiscuity.

Regarding the educational status of young girls and women in Latin America, Santamaría-Ulloa et al., Luciani et al., and Cordoba-Sanchez et al. all had similar findings. They found that education is significantly associated with pap smear screening participation. Women who never finished primary education had higher rates of never being screened for HPV.

The study done in Columbia, Cordoba-Sanchez et al., believed poor HPV vaccination uptake is due to a lack of educational programs and public media information. They found girls with lower socioeconomic status had no knowledge that the HPV vaccination prevented cervical cancer. Education is the most crucial barrier to HPV screening and prevention, as it also impacts the other obstacles mentioned in this literature review. Without education and the knowledge of the importance of cervical cancer prevention, many women do not get screened. The medical infrastructure and national organizations of low-income countries need to prioritize these populations. More education is needed on a national level to help women understand the necessary screenings for cervical cancer. Women with less education tend to get underserved in the prevention of HPV and cervical cancer. Another reason for this may be access to care.

The evaluation of eleven nurses and ten teachers (Llavall et al.) were involved in delivering HPV vaccinations in Peru. This study highlights the need for more staff training and the lack of parental knowledge about HPV decreased vaccine uptake. This study mentioned how brochures may help and more information sessions. Brochures can be provided to parents at school functions and local clinics to provide basic information on the importance of HPV prevention.

## **ACCESS**

Access to care directly impacts HPV and cervical cancer prevention in Latin American countries. According to Gottschlich et. al., in Guatemala, only 57.5% of women in rural areas reported cervical cancer screening. Women in rural areas report more barriers than those living in urban areas. The reasons for the statistic may be due to decreased public transportation, the cost of medical care, and the lack of rural health clinics. More research is needed in rural areas of Latin America to find solutions and address low access to medical care. The leading solution to



increasing access is introducing more rural health clinics and outreach programs in underserved areas.

Another prominent population with difficulty receiving access to medical care is the growing immigrant population in Central and Latin America. In 2020, the number of immigrants in Latin America reached 42.9 million, equal to 6% of the general population and 12% of the population in Central America.<sup>15</sup> The current infrastructure to help immigrants access health insurance is complicated and is seen as a double-edged sword where immigrants need regular immigration status to obtain health insurance. The cost of insurance is also a significant barrier to their care. To optimize the health of these growing populations, infrastructure change is needed to make the transition easier for immigrants to gain health access.

### **Implications for Future Practice and Research**

Based on the literature more research is needed to fully understand the barriers to HPV prevention in Central and Latin American countries. To fully comprehend the barriers to HPV prevention and implementation, a widespread survey must be conducted over Central and Latin America. This projected survey would need to be available to rural communities and focus on barriers to health care and educational status on HPV prevention. This survey would gather necessary information for National health associations while gathering participants' ideas for possible barrier solutions to increase HPV screening. Knowing the education status of HPV and cervical cancer in different communities can help national organization implement educational programs in those areas. This data would also help find holes in rural health care where more clinics are needed.

## **SUMMARY**

As stated before, the WHO has an objective plan to reduce cervical cancer mortality by 2030 worldwide by adopting the following plan to have 90% of girls vaccinated against HPV by 15 years old, 70% of women screened at 35 and 45 years old, and 90% of women identified with cervical cancer disease to receive treatment. Although this goal is rudimentary to women's health, many obstacles still exist in Latin American countries. The essential strategy is implementation programs for HPV vaccinations to be a part of every country's national schedule. Reasons for the lack of adoption of the vaccine include factors such as cost-effectiveness, legislative environment, and patient education.<sup>8</sup> Also, Latin America prioritizes other diseases such as childhood pneumonia, diarrhea, and maternal mortality, with most investments going to their prevention.<sup>8</sup> Overall, the main barriers to HPV screening and prevention are lack of education, socioeconomic status, fears and safety concerns, access to care, and cost-effectiveness.<sup>6,9</sup>

Based on the literature presented, there are many barriers to HPV prevention and screening in Latin America. The most prevalent barriers include the lack of HPV knowledge and education in many different Latin American populations. This lack of education is commonly seen in rural and low-income areas. Women with lower-socioeconomic status will find hurdles to care that others may never face, such as cost, transportation to clinics, and lower access to care. Other communities face cultural barriers and fear that HPV vaccinations may lead to the promiscuity of their young children. Other findings include fear of adverse effects, fear of needles, and lack of adherence to getting the second dose. Although many countries are making significant advances toward HPV prevention, others struggle to have solid medical infrastructure that lacks specialized medical providers, laboratories for testing, and accessible clinics. Above

all, immigrants all over Latin America struggle to receive public health care due to immigration status while fighting a double-edged sword to get citizenship in the countries they seek refuge in.

More research is needed on women's health and cervical cancer in low-income countries. This research is vital to help decrease the mortality rate of cervical cancer by increasing vaccine implementation and adherence. Educational programs on a national level.

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