



# Reframing the HPV Vaccine as Cervical Cancer Prevention

## KEY TAKEAWAYS

**KEY TAKEAWAY 1:** Parents often cite concerns about sexual promiscuity as a key barrier to vaccinating their daughters. However, limited awareness of HPV and its association with cervical cancer are also crucial barriers to consider, specifically in Africa, Southeast Asia, and South America.

**KEY TAKEAWAY 2:** Framing the HPV vaccine alongside sexual and reproductive health has mixed effects among parents who may fear increased sexual activity among their adolescent daughters. Framing the vaccine as cervical cancer prevention approach was widely accepted, but long-term impacts on vaccine uptake are still uncertain.

## BACKGROUND

**Human papillomavirus (HPV)** is one of the most common sexually transmitted infections globally, with country-specific prevalence estimates ranging from 1.6% to 41.9%.<sup>1,2</sup> HPV is causally linked with several types of cancers, including nearly **570,000 cases of cervical carcinomas each year**.<sup>3,4</sup> As of 2023, cervical cancer is the fourth most prevalent type of cancer among women globally and the **leading cause of death among women in sub-Saharan Africa**.<sup>5,6</sup> HPV infections, and subsequent sequelae, are preventable through prophylactic vaccines first made available in 2006.<sup>7</sup> HPV vaccines can be given as early as 9 years of age, although country-specific immunization programs broadly target adolescent girls between 9 and 14 years of age.<sup>7,8</sup>

The age at delivery is an important consideration for successful implementation of the vaccine. **HPV acquisition risk is greatest around sexual debut**.<sup>9-19</sup> In a 2020 study, girls who were HPV vaccinated after sexual debut were more than 2.6 times more likely to report an HPV diagnosis than their peers vaccinated before sexual debut.<sup>9</sup> Previous epidemiological studies have estimated the cumulative incidence of HPV within 3 years of sexual debut to range from 34% - 62%, underscoring the **importance of vaccinating young girls before sexual debut**.<sup>12-16</sup> However, several barriers to vaccinating young girls persist, including parental concerns of sexual promiscuity, cost, vaccine availability, and misconceptions/lack of awareness about the HPV-cervical cancer association.<sup>20,21</sup> Consideration of these factors and the **repackaging of the HPV vaccine as a cervical cancer prevention method**, rather than as a sexual and reproductive health prevention method, has been considered to improve poor vaccination coverage persisting in most countries that have introduced the vaccine into national immunization programs.<sup>22,23</sup> In this report, we will discuss four key research questions that are vital to improving HPV vaccination uptake among adolescent girls to subsequently reduce the burden of cervical cancer, globally.

## RESEARCH APPROACH

### PRIMARY RESEARCH OBJECTIVES:

- 1 Is there evidence confirming/refuting fears that HPV vaccination will lead to female adolescent sexual activity, thus lowering parental acceptance around the vaccine?
- 2 Is there any evidence indicating that once the HPV vaccine is given to girls, sexual activity is then increased?
- 3 Is there any evidence that suggests/refutes that HPV vaccination information, when packaged with information on sexual/reproductive health topics, results in parental reluctance to permit HPV vaccination?
- 4 Are there more or less favorable reactions by parents, communities, or ministries of health in packaging the HPV vaccine within sexual health vs cancer health?

### DEMOGRAPHIC SCOPE

Young Girls 9 – 14 Years



Parents of Adolescent Girls 9-14 Years



Medical Providers, Community Leaders, & Other Stakeholders



### PRIORITY GEOGRAPHIES



Africa

Southeast Asia










South America



# PARENTAL FEARS OF HPV VACCINATION

## KEY TAKEAWAYS

- 1 Parental concerns about the HPV vaccine leading to increased sexual activity and earlier sexual debut in adolescent daughters are widespread and associated with decreased parental willingness to vaccinate.
- 2 Differences in the perceived importance of changes in sexual behaviors among adolescent daughters by parents or guardians were observed across geographic regions, religious affiliations, and rural versus urban settings.
- 3 In Africa, Southeast Asia, and South America, other prominent parental concerns, such as vaccine cost, availability, limited HPV/cervical cancer health information, and misconceptions about vaccine side effects, may carry more weight to parental unwillingness to vaccinate than fears over increased sexual behaviors. This should be considered when marketing the HPV vaccine across diverse geographies.

GEOGRAPHIC SCOPE	RELEVANT PUBLICATIONS (N = 36)
 Ethiopia, Kenya, Nigeria, Tanzania, Uganda, Zambia  Denmark, France, Netherlands, Sweden, United Kingdom  Argentina, Brazil, Chile, Peru, Colombia  China, India, Hong Kong  United States	 Articles published between <b>2004 - 2023</b> Study designs include: <ul style="list-style-type: none"><li>• Cross-sectional (n = 17)</li><li>• Qualitative (n = 14)</li><li>• Systematic Review (n = 3)</li><li>• Intervention (n = 1)</li><li>• Case-control (n = 1)</li></ul> 

### **Qualitative studies suggest that low uptake of the HPV vaccine among young girls is linked to parental fears that the vaccine will lead to increased sexual activity.**<sup>21,24-36</sup>

In qualitative studies<sup>24-31</sup>, parents believed the HPV vaccine encourages sex and is a rite of passage that provides implicit consent to having earlier sex:

*"...[A]s a parent, you don't want to think of your 11-year-old being sexually active. As a mom you think, okay, if you give them this shot, is that in their mind then a rite of passage to, 'Oh, now I'm free from this sexually transmitted disease, so now it's okay to have sex.'?"<sup>25</sup>*

Parents also expressed concerns that the HPV vaccine was associated with teenage pregnancy, decreased condom use, and having multiple sexual partners:<sup>21,28,32-34</sup>

*"I don't want my daughter to have early sexual intercourse. She is too young to be pregnant. You can't put in their head that vaccine will protect them. Then they'll have sexual intercourse without condoms and then if girls get pregnant at 15, what do we do?"<sup>28</sup>*

*"Her dad didn't want to authorize it because he said it encourages having sexual relations with anyone. I explained to him that it was a vaccine to protect her against cervical cancer, but he didn't want to sign. He was also afraid something might happen to her."<sup>32</sup>*

Despite issues of promiscuity being of concern among parents, other pertinent parental concerns included adverse health outcomes of the vaccine, such as infertility among their adolescent daughters:<sup>28,34-36</sup>

*"She [a mother of a student] was telling me that it is going to make our girls infertile, or maybe they will become sexually active, she said 'me I refused my child to go for it', but I didn't ask anything more about it, so I left it at that..." - Teacher<sup>34</sup>*



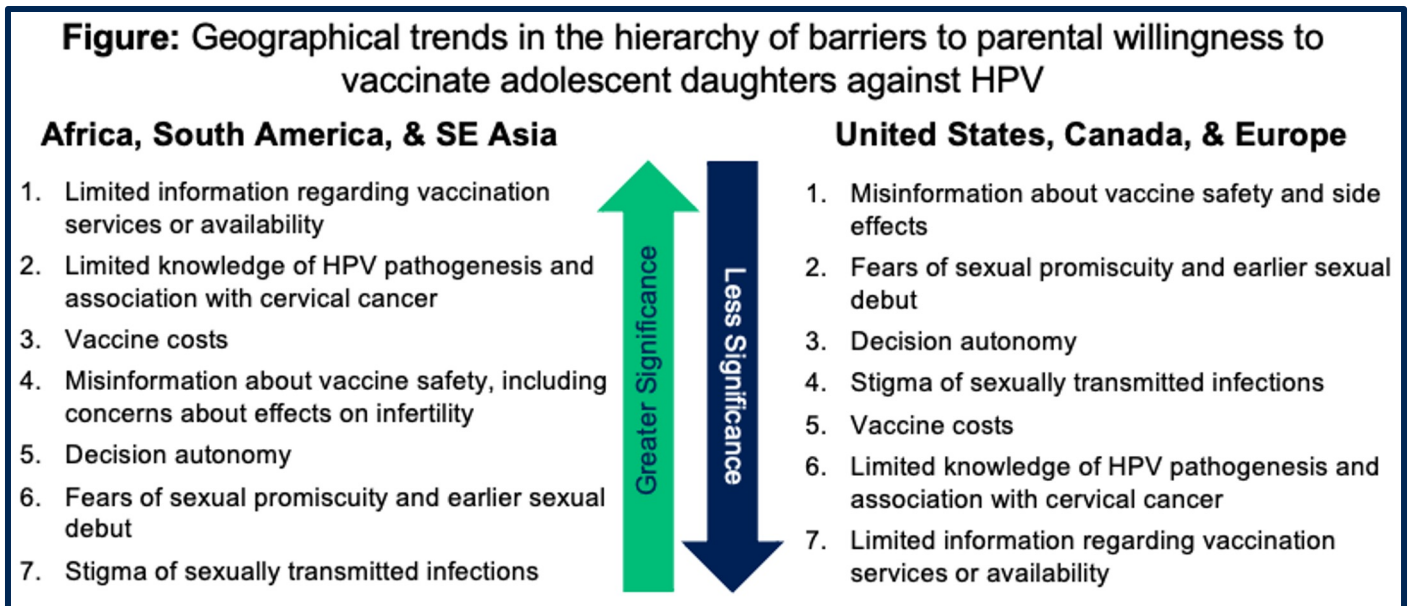
**Quantitative studies demonstrated that parental concerns about early onset of sexual activity among adolescent daughters significantly reduced the uptake of the HPV vaccine.<sup>37-57</sup>**

Up to 45% of parents opposed the HPV vaccine over concerns that it would promote risky sexual behaviors.<sup>37,39,41-48,50,51</sup> Declining parents believed the HPV vaccination could decrease condom use (23%) and increase the number of sexual partners (15%) among their adolescent daughters.<sup>40</sup> Several studies observed differences in perceived risk of sexual promiscuity among parents from different geographic or demographic backgrounds.<sup>38,49</sup> In one study from India, it was observed that Muslims were more inclined than Hindus to believe that HPV vaccination might lead to increased sexual activity among girls.<sup>49</sup> Additionally, parents residing in rural areas were more prone than those in urban areas to hold the belief that HPV vaccination could promote sexual activity among young girls.<sup>38</sup> These findings highlight widespread parental fears of the HPV vaccine’s impact on sexual debut across different geographical contexts, underscoring the necessity for tailored interventions to increase uptake and coverage of the HPV vaccine among adolescents. As summarized later in this report, the fears of HPV vaccination related to promiscuity have been debunked in the literature as misconceptions. Therefore, teenagers, parents, and community members would still benefit from continued sensitization and education to correct long-standing myths and preconceived notions surrounding vaccine benefit and harms.



**The importance of sexual promiscuity as a barrier to vaccination among parents is not weighted equally across the world.**








Several barriers to parental acceptance of the HPV vaccine, apart from concerns of increased sexual activity, need to be considered for HPV uptake among adolescent girls. Compared to literature from the United States, Canada, and Europe, studies in Africa, Southeast Asia, and South America more frequently cited parents prioritizing issues of vaccine costs, availability, lack of HPV and cervical cancer health information, stigma, and concerns of vaccine safety and impacts on fertility when considering whether to vaccinate their adolescent daughters.<sup>20,21,28,52</sup> In the United States, Canada, and Europe, access to the HPV vaccine and limited knowledge of HPV pathogenesis and associations with cervical cancer were less frequently cited than fears of sexual promiscuity or misinformation about vaccine safety and side effects.<sup>30,39,41,42</sup> The figure below summarizes the hierarchical trends of perceived barriers among parents of adolescent girls by geography enrolled across relevant qualitative and quantitative studies. It is important to note these differences by geographical location as to effectively inform how interventions are prioritized and implemented to improve HPV vaccination uptake.



# HPV VACCINATION DOES NOT CHANGE SEXUAL ACTIVITY AMONG ADOLESCENT GIRLS

## KEY TAKEAWAYS

- 1 Epidemiological studies consistently refute parental concerns that HPV vaccination is associated with increased sexual activity and reduced age at sexual debut among adolescent girls.
- 2 Relevant studies frequently originate from North America, Europe, and Australia, limiting generalizability to other geographies with less robust rollout of the HPV vaccine in national immunization programs.
- 3 More than 60% of studies on this topic were published prior to 2016, reflecting a consensus among the research community that HPV vaccination is not associated with increased sexual risk behaviors.

GEOGRAPHIC SCOPE	RELEVANT PUBLICATIONS (N = 28)
 Denmark, Spain, Netherlands, Sweden, Norway, France, United Kingdom  Colombia, Brazil  Uganda  Australia  Japan, China  United States, Canada	 Articles published between <b>2012 - 2022</b> Study designs include: <ul style="list-style-type: none"> <li>• Cross-sectional (n = 20)</li> <li>• Cohort (n = 4)</li> <li>• Quasi-experimental (n = 2)</li> <li>• Experimental Trial (n = 1)</li> <li>• Ecological Study (n = 1)</li> </ul>

Parental concerns that HPV vaccination will promote early sexual debut and promiscuous sexual behaviors among adolescent girls are long-standing and rooted in deep social and cultural norms and personal perceptions of risk. The importance of this barrier on parental decisions to vaccinate their daughters varies by geography and is well-documented in the literature. Between 2012 and the present, 28 peer-reviewed publications from 15 countries utilized cross-sectional or longitudinal designs to observe the association between HPV vaccination and subsequent changes to either risky or protective sexual behaviors among girls.<sup>58-85</sup>

### **26 epidemiological studies consistently reported no statistically significant associations between HPV vaccination and increased sexual activity among adolescent girls.**<sup>58-83</sup>

Most studies were cross-sectional (n=18), comparing self-reported sexual behaviors of girls either pre-post vaccination or among vaccinated and unvaccinated girls within the same age group.<sup>58-60,62-64,66,68-77,79</sup> These studies examined factors such as age at sexual debut, number of consistent or casual sexual partners, condom use, acquisition of other infections, abortions, or engagement in other risky sexual behaviors. An additional 8 longitudinal studies observed non-significant changes to similar behavioral factors over time, further supporting the evidence disproving concerns of early sexual debut and promiscuity among HPV vaccinated girls.<sup>61,65,67,78,80-83</sup>

### **5 studies observed increased frequency of risky sexual behaviors or earlier initiation of sexual debut after vaccination among adolescent girls.**<sup>58,59,64,66,67</sup>

In two cross-sectional studies from 2017 and 2019 in Uganda and Denmark, respectively, researchers observed that HPV-vaccinated girls were significantly younger at the age of sexual debut compared to unvaccinated girls of the same age (15.5 years versus 16.1 years).<sup>58,64</sup> Several studies also found that vaccinated girls were more likely to have multiple sexual partners, engage in sexual activity, and report less frequent condom use.<sup>59,64,66,67</sup> Among all studies reporting an association with risky sexual behaviors or earlier age at sexual debut, only one study utilized a longitudinal design, limiting the opportunity to address the causality of findings.<sup>67</sup>





### **10 studies observed increased frequency of protective sexual behaviors or delays in sexual debut after vaccination among adolescent girls.**<sup>59,65,67,68,71,72,75,82,84,85</sup>

Studies from Colombia, the United States, Canada, Netherlands, and the Nordic Region of Europe found vaccinated girls were more likely to use condoms and other forms of modern contraceptives at sexual debut or the latest sexual encounter when compared to non-vaccinated peers.<sup>59,67,68,71,72,82,84,85</sup> A 2014 cross-sectional study from Colombia also found that HPV vaccination was associated with higher routine Pap smear screening.<sup>59</sup> Additional protective behaviors, including fewer lifetime sexual partners and delay of sexual debut, were significantly associated with HPV vaccination in select studies among adolescent girls.<sup>65,85</sup>

# HPV VACCINATION AS A SEXUAL & REPRODUCTIVE HEALTH TOPIC

## KEY TAKEAWAYS

- 1 Only one study assessed parents' views on children's rights to understanding sexual and reproductive health. Nearly 80% of parents in this Kenyan study believed 10-year-olds should receive sexual education, and 83.3% were willing to vaccinate their child against HPV.
- 2 Eight studies across sub-Saharan Africa and Southeast Asia found that parents of girls aged 9-14 had generally low knowledge about HPV and the HPV vaccine. However, willingness to vaccinate daughters remained high across these populations.
- 3 Studies assessing parental knowledge of HPV and willingness to vaccinate daughters aged 9-19 (n=3) or both male and female children (n=8) found similarly low levels of knowledge about HPV as an STI but persistent willingness to vaccinate.

GEOGRAPHIC SCOPE	RELEVANT PUBLICATIONS (N = 19)
 Cameroon, Nigeria, Ethiopia, Kenya, South Africa	 Articles published between <b>2010 - 2023</b> Study designs include: <ul style="list-style-type: none"> <li>● Cross-sectional (n = 13)</li> <li>● Qualitative (n = 2)</li> <li>● Systematic Review (n=2)</li> <li>● Randomized Trial (n = 1)</li> <li>● Discrete Choice Experiment (n = 1)</li> </ul>
 Indonesia, Malaysia, Thailand, Vietnam	
 United States	

Overall, the literature demonstrates that HPV knowledge among parents is generally low, but willingness to vaccinate children, particularly daughters aged 9-14 years, remains high.<sup>23,43,47,86-101</sup> Increasing HPV knowledge was associated with increased parental willingness to vaccinate across several studies. While increasing parental HPV knowledge is not sufficient to ensure high vaccine uptake among young girls, it is a key component of HPV vaccination campaigns.

### Parents of Daughters (9-14 Years)




In the literature, it remains ambiguous whether knowledge of HPV as an STI is directly associated with increased parental willingness to vaccinate daughters. Three studies from Africa found that more parents were willing to vaccinate their daughters than those who knew HPV was a sexually transmitted disease.<sup>87,94,98</sup> In contrast, one study found ~50% of parents had moderate knowledge of HPV as an STI, but only 40% indicated favorable attitudes about vaccinating their daughters.<sup>89</sup> A qualitative study from Cameroon indicated that knowledge of HPV vaccines was low, but most concerns were around access, side effects, and government mistrust, such as beliefs that the vaccine was intended to limit lifespan or fertility of certain subpopulations.<sup>97</sup> One study found that, following an education intervention, more parents were aware that HPV was sexually transmitted (44 percentage point increase) and willingness to vaccinate daughters also increased (14 percentage point increase; final proportion = 93%).<sup>91</sup>


### Parents of Children (Male & Female, 9-14 Years & Adolescents)

Although several studies included parents of both male and female children, parents had similarly low knowledge of HPV, yet relatively high willingness to vaccinate their children. In Nigeria, 83% of parents thought HPV vaccination should be given to girls aged 9-13 years.<sup>47</sup> A second Nigerian study found that more parents were willing to vaccinate than the number that knew HPV was sexually transmitted.<sup>88</sup> Furthermore, high HPV knowledge, including awareness of HPV as a sexually transmitted infection, was associated with 16-fold greater odds of vaccine acceptance among parents.<sup>92</sup> Only one study assessed parents' attitudes towards children understanding their sexual and reproductive rights; Kenyan parents were willing to vaccinate children at high levels (~80%) while 83% of parents agreed that 10-year-olds should be given sex education.<sup>43</sup> In contrast, two studies (Nigeria and South Africa) found higher levels of knowledge among parents that HPV is an STI and lower willingness to vaccinate children or lower uptake of the vaccine.<sup>99,101</sup>

## KEY TAKEAWAYS

- 1 Four studies compared cervical cancer prevention messaging to other HPV vaccination messaging approaches. Findings were mixed, with two studies observing no significant difference in parental intent or willingness to vaccinate their daughters among those receiving cervical cancer prevention messaging versus other messaging strategies. In contrast, two studies found a statistically significant increase in intent/willingness to vaccinate among parents presented with cervical cancer prevention messaging.
- 2 Caregivers with knowledge that HPV vaccination prevents cervical cancer were more likely to indicate willingness to vaccinate their daughters.
- 3 Cervical cancer prevention was identified by caregivers as the best reason given by providers for HPV vaccination in one US-based study.
- 4 Most studies reported intent or willingness to vaccinate as the primary outcome, which may not translate into long-term vaccine uptake as shown in several intervention-based studies.

GEOGRAPHIC SCOPE	RELEVANT PUBLICATIONS (N = 28)
 Ethiopia, Kenya, Tanzania, Uganda  Indonesia, Japan, Malaysia  Argentina, Brazil  Poland  United States	 Articles published between <b>2009 - 2023</b> Study designs include: <ul style="list-style-type: none"> <li>• Cross-sectional (n = 11)</li> <li>• Randomized Trial (n = 4)</li> <li>• Intervention (n = 2)</li> <li>• Qualitative (n = 1)</li> <li>• Systematic Review (n = 1)</li> </ul>

 **While findings from interventional studies are inconclusive at present, it appears that providing parents/caregivers with information about HPV and cervical cancer does increase willingness to vaccinate compared to sexual and reproductive health framing alone. However, it is uncertain whether an increase in willingness to vaccinate translates to vaccine uptake.**

Six studies directly compared the impact of cancer health messaging to sexual and reproductive health messaging on HPV vaccination acceptance among parents of adolescent girls, with all but one conducted in the United States.<sup>22,23,102-105</sup> While one study found that parents viewed cancer prevention as the best reason given by providers for HPV vaccination, the results from trials comparing messaging approaches are mixed.<sup>102</sup> One study from Japan compared parental willingness to vaccinate adolescent daughters after viewing either a short film with a cervical cancer survivor who narrated her story or a slideshow with basic information about the HPV vaccine that briefly mentioned cervical cancer prevention.<sup>22</sup> Researchers found an increased willingness to vaccinate daughters among caregivers who viewed the film. However, no significant difference in vaccination rates between those who saw the film and those who viewed the slides was found after 3 months (8.2% vs. 7.9%). In another study, parents were randomly assigned to view short video messages on one of seven topics about HPV.<sup>103</sup> Confidence in the HPV vaccine among parents whose children had not yet received the HPV vaccine was highest among participants who were exposed to messages about cervical cancer prevention.

In a 2009 study by Leader et al., individuals were assigned one of three framing paragraphs to read: one that focused on cervical cancer prevention, one that focused on cervical cancer and STI prevention, and one that focused on cervical cancer and STI and the possibility that it may lead to increased sexual promiscuity.<sup>23</sup> There was no statistical difference in intent to vaccinate daughters found between intervention groups. Finally, a 2018 study also found no significant difference in intent to vaccinate daughters among those who received either a cervical cancer prevention message, a US CDC message, or no message about HPV vaccination.<sup>104</sup>

# REFRAMING HPV VACCINATION AS CERVICAL CANCER PREVENTION (CONT.)

 There is existing literature from observational studies evaluating how health literacy on cervical cancer and the HPV vaccine's ability to prevent cervical cancer subsequently improves parental willingness to vaccinate daughters.<sup>20,45,50,52,91,94,106-112</sup>

A 2023 systematic review cited 10 studies from countries in sub-Saharan Africa that reported correct knowledge of HPV, the HPV vaccine, and the consequences of cervical cancer as the most important facilitators of HPV vaccination uptake and willingness to get vaccinated.<sup>20</sup> Additionally, limited knowledge of HPV's role in cervical cancer development was found to be a barrier to HPV vaccination in six articles.<sup>20</sup> Recent studies from Ethiopia, Tanzania, Indonesia, and Argentina reported significant odds of greater willingness or intent to vaccinate adolescent daughters among parents with knowledge of HPV vaccine's impact on cervical cancer prevention.<sup>45,91,94,106,107</sup> Studies reporting impact on HPV vaccine uptake as a primary outcome are less common.<sup>52,110</sup> A study from Poland found that parents who agree with the statement "HPV vaccination protects against cancer" were more likely to have daughters who had received the vaccine.<sup>108</sup> A Brazilian study of non-compliance with the HPV vaccination schedule found a lower, but non-significant, association between missing either the first or second recommended HPV vaccine with lack of knowledge that the vaccine is effective in preventing cervical cancer.<sup>109</sup> While most studies have focused on caregiver/parent knowledge, a 2023 study in Lira City, Uganda, surveyed girls aged 9 – 14 years to assess factors associated with HPV vaccine uptake.<sup>110</sup> They found that the odds of being vaccinated among girls who were taught about cervical cancer in school were much higher when compared with peers who indicated they were not taught about cervical cancer in school.

## MOVING FORWARD: OPPORTUNITIES & CONSIDERATIONS



Globally, HPV and cervical cancer health literacy among parents of girls aged 9-14 years is poor and investment in expanding health education campaigns would dispel several barriers to vaccine acceptance, including concerns of infertility, sexual promiscuity, and necessity.



Future research should prioritize expanding findings in Africa, SE Asia, and South America to better understand geographic-specific barriers and facilitators to vaccinate that may not be reflected in the current body of literature from the United States, Canada, and Europe.



As many barriers to vaccination exist among parents of adolescent girls, HPV vaccine marketing should not be siloed, but rather include culturally-specific information about HPV pathogenesis, associations with cervical cancer, costs, and dispel common misconceptions.



Additional intervention-based studies are needed to understand how delivery of cervical cancer information to parents, caregivers, and other community members impacts long-term changes to vaccination uptake among girls 9 - 14 years of age.

### PROJECT TEAM

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