



## Need for Primary Prevention of Carcinoma Cervix: Barriers for HPV Vaccination and Experience in Implementing HPV Vaccination at a Tertiary Care Teaching Hospital in South India

**Papa Dasari\***

Senior Professor, Department of OBGY, WCH, JIPMER, Puducherry, India

**\*Corresponding Author:** Papa Dasari, Senior Professor, Department of Obstetrics and Gynaecology, WCH, JIPMER, Puducherry, India.

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### Abstract

HPV vaccine, known generally as cancer vaccine has not been introduced in to the immunisation programme in India despite its implementation in more than 100 countries since 2009. It not only prevents the occurrence of carcinoma cervix but all other cancers such as oral, nasopharyngeal, anal and penile which are caused by HPV virus. The barriers for not implementing this vaccine are many such as unawareness of its benefits, myths regarding its side effects and lack of accountability on the part of health care administrators. The review presents the need for HPV vaccination and barriers for its implementation along with personal experience of its implementation in an Institute of National importance.

**Keywords:** Carcinoma Cervix; CIN; HPV Vaccination; Barriers; Myths

### Introduction

Human Papilloma Virus (HPV) causes six types of cancers in humans viz; carcinoma cervix, vagina, vulva, anus, penis and oropharynx. Of these, carcinoma cervix is the most common cancer that kills women in their 4<sup>th</sup> and 5<sup>th</sup> decade of life. It was proved beyond doubt that HPV is present in 92% of cervical cancers and the credit of this association goes to the Noble prize winner Harald Zur Hassan [1].

Prevention is the most important intervention for any disease and more so for cancer because of the mortality associated with it and its asymptomatic nature in early stages. Primary prevention of diseases is by vaccination and it applies for cancer too as HPV Vaccine is popularly known as cancer vaccine.

Though more than 100 countries have introduced HPV vaccination in to their immunisation schedule, India has not yet achieved this due to many barriers. Even in countries who

introduced the vaccine the uptake of vaccine is not optimum due to various barriers.

The aim of this article is to perform a narrative review of the barriers for practice of HPV vaccination in India and other countries and to share personal experience in introducing HPV vaccine in a tertiary care Institute in South India.

### Incidence of HPV associated cancers and mortality

In less developed countries, among the HPV associated cancers, carcinoma cervix is the leading cancer (93%). Anal and penile cancers constitute 2% each and vulval, vaginal cancers and oropharyngeal cancers are reported to occur in 1%. In developed countries, 65% of Cancer cervix, 13% of oropharyngeal cancers, 10% of anal cancers, 6% of vulval cancers, 35 penile cancer and 3% vaginal cancers are associated with HPV. The reported mortality rates were highest for carcinoma cervix 12.8 per 1,00,000 women followed by breast cancer which was 9.4 per 100000 [2,3].

### HPV burden and incidence of carcinoma cervix

The prevalence of HPV in women with normal cytology was reported as 11.4% for the World and 7.9% for women of Southern Asia and India. But the crude incidence rate of carcinoma cervix was high among Indian women 23.5% when compared to 21% and 15.8% for women of Southern Asia and World respectively. This risk remains high when age-standardised rates were also considered (27%, 25% and 15.2%: India, Southern Asia and World respectively). The cumulative risk of carcinoma cervix was estimated to be 2.8 for Indian women, 2.7 for women of Southern Asia and 1.8 for women of World [3,4].

### Age standardised mortality rates of carcinoma cervix

The 2018 estimates of age standardised mortality rates for Indian and African women with cervical cancer showed 17.5 per 1,00,000 per year when compared to less than 5.5 for women living in North America.

World estimates of 2018 reveal that 3,11,365 deaths occur annually due to carcinoma cervix and it is the second most common cause of mortality among women aged 15-44 years [5].

### Burden of the disease in developing nations

In developing countries, carcinoma cervix is the commonest of all cancers in women (34%). Yearly 1 among 32,000 are diagnosed with the disease and 74,000 die due to the disease. In India, 366.58 million females aged more than 15 years are at risk. Every year 1,34,420 are diagnosed with the disease and 72,825 die. In 2008, 5,29,409 new cases and 2,74,883 deaths were reported. It is estimated that cervical cancer will occur in approximately 1 in 53 Indian women during their lifetime compared with 1 in 100 women in more developed regions of the world [6,7].

The above facts highlight the need for disease prevention. The various options are health education regarding sexual/genital hygiene, prevention of childhood and adolescent marriages, adopting preventive strategies for sexual transmission of HPV like condom barrier and screening for pre-invasive cancer by Pap test or HPV-DNA test at regular specified intervals. In practice all these strategies do not materialize and compliance is poor. Vaccination is the definitive strategy for prevention of disease.

### Role of HPV Virus in the development of carcinoma cervix

There are more than 100 types of HPV viruses and the malignant process occurs only when infected with Oncogenic HPV. The most common Oncogenic viruses are 16, 18, 31 and 45 which account for 80% of carcinoma cervix and others are 33, 35, 39, 51, 52, 56, 58, 59, and 68. It has been estimated that Women over 30 years of age who are infected with high-risk HPV may be up to 116 times more likely to develop severe dysplasia than similar, uninfected women. It reaches a peak of at least 20 percent among women between the ages of 20 and 24 years of age, with a subsequent decline to approximately three percent among women over 30 years of age [8,9].

Initiation of malignant process: The virus upon coming in to contact with the epithelium of cervix, the protein capsid comes into contact with that basal cell and the HPV DNA enters the cell and leaves the capsid. The L1 gene is important because it produces the protein capsid that surrounds the DNA. The two most important anti-cancer genes or anti-onco genes are p53 and the retinoblastoma gene. E6 of HPV genome blocks these and cause —mutation and immortalisation of cell and then Cancer. The viral region consisting of E1, E2, E4, E5, E6, and E7, are involved in viral replication and oncogenesis.

### Need of HPV vaccine

In the World, 2,874 million women aged 15 years and more are at risk of developing cervical cancer. Every year 569,847 are diagnosed with cervical cancer and 311,365 died. More than 30,000 cancers linked to human papillomavirus (HPV) are diagnosed each year in the U.S., and most can be prevented by a vaccine. Vaccine can prevent 28,500 HPV-related cancer cases a year. Roughly 60% of female teens and 41.7% of male teens in the U.S. received at least one dose in 2014. Only 39.7% of the females and 21.6% of the males completed the three-dose series, according to the report. Hence it is the need of the hour to increase vaccination. Moreover 85% of people will get an HPV infection in their lifetime [10].

### Development of HPV vaccine

The vaccine was developed in 1980, by researchers Ian Frazer and Jian Zhou at Georgetown University Medical Center, the University of Rochester, the University of Queensland in Australia, and the U.S. National Cancer Institute respectively. They have been

accorded priority under U.S. patent law for the invention of the HPV vaccine's basis, the VLPs (viral like particles). The VLPs contain no viral DNA and hence they cannot infect cells, reproduce or cause disease.

The vaccines are developed from DNA-free virus-like particles (VLPs), synthesized by self-assembly of fusion proteins of the major capsid antigen L1. Gardasil is quadrivalent vaccine which was FDA approved in 2006 and Australia was the first country to implement it. Each 0.5 ml of Gardasil contains 20 mcg of HPV L1, 40 mcg of HPV 11 L1, 40 mcg of HPV 16 L1 and 20 mcg of HPV 18, L1 proteins with 225 mcg of aluminum as adjuvant (as Amorphous Aluminum Hydroxyphosphate Sulfate) It also has 9.56 mg of sodium chloride, 0.78 mg of L-histidine, 50 mcg of polysorbate 80, 35 mcg of sodium borate, <7 mcg yeast protein/dose, and water for injection.

Cervarix is a bivalent vaccine and was FDA approved in 2009. It contains highly purified virus-like particles (VLPs) of the major capsid L1 protein of HPV types 16 and 18.

Gardasil-9 (Nonavalent Vaccine) was approved in 2014 and it contains HPV 31/33/45/52/58, which are the most frequently detected types in invasive cervical cancer, after HPV 16 and HPV 18.

### **Vaccine recommendations**

The AICP recommends routine vaccination to be initiated at 11 to 12 years of age and till 26 years if not vaccinated earlier.

CDC recommended three-dose schedule at 0, 1-2 and 6 months. Three doses are recommended for immunocompromised persons (including those with HIV infection) aged 9 through 26 years. CDC declared the vaccine safety and effectiveness through a separate link.

The World Health Organization (WHO) recommends that girls ages 9 to 13 years receive 2 doses of the HPV vaccine (at 0, 6 months) to prevent infection with the virus types responsible for the majority of cervical cancer cases [11].

### **Efficacy of HPV vaccine**

CDC reports efficacy of HPV vaccines to be close 100% against HPV vaccine type related persistent infections, CIN2/3, adenocarcinoma in situ following a 3 dose schedule initially practiced but a dose schedule given at 6 to 12 months apart was

also good and proved to be non-inferior in later clinical trials [12]. Further an Indian study provided evidence for high efficacy of single dose of a HPV vaccine against persistent HPV 16/18 infection and the efficacy lasted for more than 10 years [13]. A study in US women which compared the efficacy of 1,2 and 3 doses of HPV 4, concluded that the efficacy was highest if the first dose was received  $\leq$  18 years of age [14]. Currently nonavalent vaccine efficacy is being replaced with HPV4. The proportion of additional cases potentially prevented by the nonavalent vaccine was 14.4%-23.8% for LSIL, and 19.0%-32.8% for HSIL. The benefit of the nonavalent vaccine compared to the quadrivalent vaccine was more than 80% for both low and high impact estimates for LSIL and more than 50% for both low and high impact estimates for HSIL [15].

### **Barriers for HPV vaccination**

Though AICP recommended and published the benefits of HPV vaccination for boys and young men but it is not being followed by the health care providers and also the demand from the beneficiaries for the vaccination is less. Despite the recommendations by CDC also, in United States, only 49.5% of females and 37.5% of males ages 13 through 17 have received all recommended HPV vaccine doses. This fell 80% below the target set forth by the Healthy people initiative 2020 [16,17].

A study comprising of two cross sectional surveys at a single air force Centre which included family physicians and staff of air force regarding their practices and male service members between 18-30 years as patients found that family physicians have adequate knowledge regarding the vaccination but they do not routinely offer HPV vaccination to males and lack of time was cited as the reason. The male service men did not have adequate knowledge regarding the benefits of the vaccine and forgetfulness of taking subsequent doses was also one of the reasons cited. On the whole only 27% completed the vaccine series [18].

A study undertaken under ACS (American Cancer Society) to identify the facilitators and barriers for implementation of HPV VACs programme in 130 clinical or school based centres found EER systems, lack of communication and information regarding completion of all 2 doses, training needs of the staff, deploying staff already committed to other work and lack of commitment provider on the part of the provider. Other barriers were patient

mis-information and vaccine stigma, cultural and language barriers, low health literacy and state registry issues [19]. Lack of provider recommendation is the major barrier encountered [16]. A systematic review which included 13 studies found lack of knowledge about HPV and the HPV vaccine, fear about the safety and efficacy of the HPV vaccine, fear about not being able to pay for the HPV vaccine, and discrimination attributed to the HPV vaccine [20].

**Experience in implementation and the barriers encountered**

HPV vaccine was introduced in JIPMER hospital as a part of adolescent reproductive health clinic in 2017 after appraising the need for the same to the Medical Superintendent, (Cardiologist) who readily sanctioned it to be given freely. Implementation

took place in 2018 after forming a team consisting of consultant Obstetrician and Gynaecologists, Nursing officers and the vaccine was stored in the department of Obstetrics and Gynaecology. The vaccine (Gardasil-manufactured by Merck) was administered weekly on every Saturday and subjects needed to preregister for the same and sign the Informed consent form (Figure 1). After taking history especially allergy to any drugs and vaccines in earlier life general physical examination was done. Informed consent was taken after explaining the common side effects and the need to stay for observation. Subjects were made to lie in supine position and pulse, BP was recorded and SpO<sub>2</sub> was checked with pulse oximeter. The vaccine was administered intramuscularly by the Gynaecologist on the upper outer quadrant of thigh under aseptic precautions (Figure 2).

**DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY**  
 JAWAHARLAL INSTITUTE OF POSTGRADUATE MEDICAL EDUCATION AND RESEARCH (Institute of National Importance under Ministry of Health and Family Welfare, Government of India) DHANVAITARI NAGAR, PUDUCHERRY - 605 006

**Human Papillomavirus (HPV) Vaccination Consent form**

**DETAILS**

NO: \_\_\_\_\_

Surname: \_\_\_\_\_ Given names: \_\_\_\_\_ Gender:  Female  Male

Date of birth: \_\_\_\_\_

Address: \_\_\_\_\_

Postcode: \_\_\_\_\_

Parent/legal guardian full name: \_\_\_\_\_

Tel: \_\_\_\_\_ Mobile phone: \_\_\_\_\_

Relationship with the vaccine recipient:  Parent  Legal guardian

**THE VACCINATION CHECK LIST**

Has the vaccine recipient:

1. Ever had severe reaction following a vaccine?  
 No  Yes
2. Ever had severe allergies?  
 No  Yes
3. Ever had an allergy to any component of the HPV vaccine?  
 No  Yes
4. Is unwell on the day of immunisation and has a fever of 38.5°C (101.3°F)  
 No  Yes
5. Is the vaccine recipient pregnant?  
 No  Yes

HPV Vaccine can prevent most cases of cervical cancer in females, if it is given before exposure to the vaccine virus. In addition, it can prevent vaginal, vulvar cancer and genital warts in females.

HPV vaccine is given as 2(9-13 yrs)/ 3-dose (>14 yrs)

1<sup>st</sup> Dose: Now  
 2<sup>nd</sup> Dose: 2 months after Dose 1  
 3<sup>rd</sup> Dose: 6 months after Dose 1

Most side effects are minor, last short time and do not lead to any long term problem.  
 Possible side effects may include soreness where inj. was given, mild fever, feeling unwell, headache and fainting shortly after vaccination.  
 More serious side effects are rare and include severe allergic reactions.

**CONSENT FOR VACCINATION**

YES I have understood the information given to me about vaccination, including risks and side effects. I understand that I am giving consent for HPV vaccine to be administered over six months. I have been given the opportunity to discuss the risks and benefits of vaccination with an immunization provider. I understand that consent can be withdrawn at any time before vaccination takes place.

I give my consent for my child to receive the full course of Human Papillomavirus vaccine

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

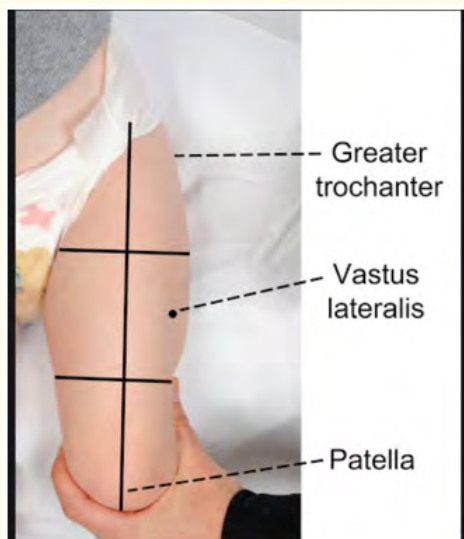
Patient/parent/legal guardian

**CARE AFTER VACCINATION**

Sitting or lying down for about 15 minutes after a vaccination can help prevent fainting and injuries caused by falls. For redness or swelling at injection site, apply a cold compress. If any reaction occurs that you consider serious or unexpected, seek medical advice.

|                               | DOSE 1 | DOSE 2 | DOSE 3 |
|-------------------------------|--------|--------|--------|
| DATE OF VACCINATION           |        |        |        |
| BATCH NO                      |        |        |        |
| EXPIRY DATE                   |        |        |        |
| VACCINATOR'S SIGNATURE /STAMP |        |        |        |

**Figure 1:** Consent form for HPV Vaccination.



**Figure 2:** Site for administration of HPV vaccine.

The subjects were made to lie supine for 20 minutes and after checking the vitals they were sent with instructions regarding the report of side-effects. Initially the vaccine was supplied as PFS but later it was in the vial and mixing needed to be done as it was in the powder form. A total of 55 subjects received the vaccine voluntarily in 2018 and these were resident doctors (30), medical students (17), Nurses (4) and adolescents of general public (4). Coverage of second dose was 94.5% and third dose was 85.5%. However, all subjects received all 3 doses at their own expense (6.5% for second dose and 14.5% for third dose) as the vaccine was not readily available through our Pharmacy. Table 1 shows the age distribution of the volunteers and their designation. In 2018 to begin with 30 doctors (Residents of Obstetrics and Gynaecology) volunteered to take the vaccine followed by MBBS students (17) and four nurses.

In 2019, 14 nurses, 12 doctors and 12 students opted to get immunised. This difference is because of awareness of availability of the vaccine among different categories of volunteers. The age group was mainly adults (64%) as the awareness to general public was not taken up by the Institute.

In 2019, 45 subjects registered and the provision of second dose was only to 57.7% and third dose 64.4% but all completed their vaccination at their own expense. Table 2 and 3 show the details of the provision of the 3 doses and number of doses of self-purchase. This shows that their awareness and dedication towards the preventive aspect of this deadly disease. No side effects attributable to vaccine were reported though one person reported diarrhoea of few episodes which lasted for a day on the same day of injection.

| Characteristic   | 2018<br>N = 55 | 2019<br>N = 45 | Total<br>N = 100 |
|--|----------------|----------------|------------------|
| Age in years   |                |                |                  |
| 9-14   | 2              | 9              | 11               |
| 15-20  | 6              | 19             | 25               |
| 21-25  | 33             | 15             | 48               |
| 26-30  | 14             | 2              | 16               |
| Designation  |                |                |                  |
| Doctors  | 30             | 12             | 42               |
| Nurses   | 4              | 14             | 18               |
| Students(MBBS)   | 17             | 12             | 29               |
| General OPD<br>(Adolescent reproductive health clinic) | 4              | 7              | 11               |

**Table 1:** Characteristics of the Population received HPV vaccination.

| Population   | I <sup>st</sup> dose provided<br>N = 55 | II <sup>nd</sup> dose Provided<br>N = 52 | III <sup>rd</sup> dose Provided<br>N = 47 | Completed all doses | Self-purchase of doses |
|--|---|--|---|---------------------|------------------------|
| Doctors  | 30                                      | 29                                       | 26  | 30                  | 5                      |
| Nurses   | 4                                       | 4  | 4   | 4                   | -                      |
| Students (MBBS)  | 17                                      | 15                                       | 14  | 17                  | 5                      |
| General OPD<br>(Adolescent reproductive health clinic) | 4                                       | 4  | 3   | 4                   | 1                      |
| Total  | 55                                      | 52(94.5%)                                | 47(85.5%)                                 | 55(100%)            | 11                     |

**Table 2:** HPV Vaccine Doses taken (Gardasil) (2018).

| Population                           | I <sup>st</sup> Dose Provided<br>N = 45 | II <sup>nd</sup> Dose Provided<br>N = 26 | III <sup>rd</sup> dose Provided<br>N = 29 | Completed all doses | Self-purchase of doses |
|--------------------------------------|---|--|---|---------------------|------------------------|
| Doctors                              | 12                                      | 6  | 8   | 12                  | 6                      |
| Nurses                               | 14                                      | 8  | 8   | 14                  | 12                     |
| Students (MBBS)                      | 12                                      | 8  | 8   | 12                  | 8                      |
| General OPD Adolescent health clinic | 7                                       | 4  | 5   | 7                   | 5                      |
| Total                                | 45                                      | 26(57.7%)                                | 29((64.4%)                                | 45(100%)            | 31                     |

**Table 3:** HPV Vaccine doses taken (Gardasil) (2019).

The vaccination programme came to stand still in the later part of 2019 with the superannuation of the Medical Superintendent who permitted and with the arrival of a new Medical Superintendent who stopped the supply of vaccine citing reasons of court case registered in the trial in Gujarat and Andhra Pradesh which was already a solved issue. Despite efforts of providing the evidence for HPV vaccine safety to the new chair, the vaccine was not provided, further all the faculty of Obstetrics and Gynaecology department received emails from the new chair that it is unsafe citing the same old Vaccine trial of Gujarat and Khammam. Permissions to put up the HPV vaccination programme on the Institutes website for the Public and its provision through Adolescent Reproductive Health clinic which runs on every Saturday were also denied. Discussions with the new Director also did not yield positive results as the vaccine is costly and his opinion was each individual should buy it and take. Many students who came forward requesting HPV vaccine were turned away.

The barriers identified here are two. One is sanctioning authorities not accepting the Vaccine’s safety despite evidence and giving importance to reports of conflicts available on the internet. Second is the issue of cost for providing it free for the public.

**Discussion**

Programs had average performance coverage of around 67% for the first dose and 53% for the final dose of HPV. LMICs performed on average better than high- income countries for the first dose, but worse for the last dose due to higher dropout. Only 5 (6%) countries achieved coverages with the final dose of more than 90%, 22 countries (21%) achieved coverages of 75% or higher while 35 (40%) had a final dose coverage of 50% or less. When expressed

as world population coverage (i.e., weighted by population size), global coverage of the final HPV dose for 2019 is estimated at 15% [21,22].

**Overcoming barriers for HPV vaccination**

Controversies regarding the side -effects of HPV vaccine solved by WHO should be widely publicised. Adverse effects of autoimmune, neurological and venous thromboembolic events were studied in a large cohort (Study in Sweden and Denmark) which found no association between HPV Vaccine and these disorders [23]. Complex regional pain syndrome (CRPS) and Postural Orthostatic Tachycardia syndrome (POTS) attributed to HPV Vaccine was resolved by European study [24]. Safety profile was already established through provisions of sites/links where the adverse effects can be deposited viz: Vaccine Adverse Event Reporting System (VAERS) -Public Health System -CDC and FDA,Vaccine Safety Data link (VSD)—CDC- Health Organisations and Clinical Immunization Safety Assessment (CISA) Project -CDC & Medical Research. Post-licensure safety monitoring from June 2006 through March 2013 did not report any new or unusual patterns of adverse events to suggest a HPV vaccine safety concern. Syncope (fainting) is the most common side-effect observed. To decrease the risk of falls and other injuries that might follow syncope, CDC’s Advisory Committee on Immunization Practices (ACIP) recommends that clinicians consider observing patients for 15 minutes after vaccination [16].

Addressing the myths associated with HPV vaccine is very important. HPV Vaccine rates dropped in Japan in 2017 following an alleged fraudulent mouse study. Riko Muranaka of Kyoto University uncovered the pseudoscience and was awarded the prestigious John Maddox prizefor the same [25].

First and foremost, healthcare providers (HCPs) must make a strong recommendation to vaccinate patients and these recommendations must become routine and this should include vaccination for males as the HPV is sexually transmitted. Though the vaccine is licenced in India recommendations for inclusion in to the immunisation schedule is missing all these years and now the Govt is at its best to implement it [26].

HPV vaccination rates improve significantly when vaccine administration occurs at designated, well-organized sites such as school-based vaccination programmes. Furthermore, HPV vaccination should be a high school requirement and offered in the standard adolescent vaccine panel as a bundle with Tdap and MenACWY vaccines in order to promote maximum adherence. The HPV vaccine is a vaccine against cancer and should be aggressively marketed as such. As healthcare providers, we need to make every effort to overcome barriers, real or perceived, to protect our population from potential morbidity and mortality associated with this virus [16].

According to the CDC, if health care providers increase HPV vaccination rates in eligible recipients (12 year of age) to 80%, it is estimated that an additional 53,000 cases of cervical cancer could be prevented during their lifetime. Furthermore, for every year that the vaccination rate does not increase, an additional 4400 women will develop cervical cancer [16]. This fact should be displayed in all health care centres along with the information of safety regarding HPV vaccine.

More effective approach and mechanisms to improve the benefits of the knowledge regarding vaccine and its uptake are to be devised by Health educators, Public health proponents and vaccine advocates. Health education programmes conducted in Schools contribute to increase in knowledge of the parents and school teachers and remove the myths. On such study which was undertaken in 2013-2014 has improved the knowledge regarding all aspects of carcinoma cervix and HPV vaccination and more than 90% of the mothers wanted vaccinate their daughters [27].

Addressing the problems and solutions to reduce mortality from carcinoma cervix David GK suggested 3 solutions for implementation of HPV Vaccination viz: 1, continued reduction in cost, 2. Government health programme adoption 3. School based

programmes [28]. To overcome the barriers for HPV Vaccine in rural areas a multi component peer based approach is suggested by Finlay P and colleagues. This includes 1. Peer-based education. 2. School-based vaccination and awareness. 3. Parent or guardian involvement. 4. Stakeholder engagement [29].

CDC provides global technical assistance for implementation and evaluation of HPV vaccination pilot projects and programs and laboratory-related HPV activities to assess HPV vaccines. These activities contribute to the Global Health Security Agenda action packages to improve immunization, surveillance, and the public health workforce globally [30]. Medical Institutes should take this opportunity and participate in these activities.

To address the cost issue, a single dose policy may be formulated and implemented as the efficacy in terms of long lasting immunity up to 7 years was reported from a multicentric randomised controlled Indian study in 2018 [31]. Recently a modelling study which used HPV transmission model (EpiMetHeos) to Indian data adopted thresholds to define cervical cancer elimination: an age-standardised incidence rate of less than 4 cases per 100 000 woman-years, and standardised lifetime risk of less than 250 cases per 100 000 women born. The research concluded that scaling up cervical cancer prevention through single-dose HPV vaccination could substantially reduce cervical cancer burden in India [32].

In India, the HPV vaccine is not a part of the national program and is available in the private sector for ₹2,000 to ₹3,000 for a dose. Dr. Sowmya Swaminathan, ICMR 2015, as the Secretary of the National Technical Advisory Group on Immunisation commented that “The HPV vaccine is offered in the private sector and people who can afford it are getting it. But the poor who are more vulnerable are not getting it”. The introduction of HPV vaccination as part of the Universal Immunisation Programme, is being considered [33]. This truth calls for provision of free HPV Vaccine in India.

## Conclusion

There is adequate evidence regarding the need, efficacy and safety of HPV Vaccine in prevention of carcinoma cervix. The recommendations for HPV vaccination are given by WHO, ACIP, CDC and many countries have implemented the same in to the

immunisation schedule but the barriers in India seem to be lack of implementation at the health care provider level. The myths still need to be addressed to remove the barriers for effective implementation of HPV vaccine. School based programmes can increase the uptake of the vaccine.

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