**­­**

**HPV resource package**

Part 1: Questions and answers

Contents

[Questions parents ask 2](#_Toc488755527)

[What is HPV? 2](#_Toc488755528)

[How does a person get HPV? 2](#_Toc488755529)

[How common is HPV? 2](#_Toc488755530)

[Is the human papillomavirus (HPV) dangerous? 2](#_Toc488755531)

[What does the HPV vaccine do? 2](#_Toc488755532)

[What is in the HPV vaccine? 2](#_Toc488755533)

[Why get the HPV vaccine? 2](#_Toc488755534)

[Is the vaccine effective for someone who is already sexually active? 2](#_Toc488755535)

[What causes cervical cancer? 2](#_Toc488755536)

[Is it possible to avoid getting HPV? 2](#_Toc488755537)

[Is vaccination the only way to prevent HPV infection and cervical cancer? 2](#_Toc488755538)

[Is it possible to get tested for HPV and cervical cancer? 2](#_Toc488755539)

[How common is cervical cancer among those who don’t get vaccinated? 2](#_Toc488755540)

[Do HPV vaccines work? 2](#_Toc488755541)

[Is there more than one HPV vaccine, and what is the difference between them? 2](#_Toc488755542)

[Which HPV types does the vaccine protect against? 2](#_Toc488755543)

[Why get vaccinated if the vaccine only covers some of the circulating HPV types? 2](#_Toc488755544)

[Who produces the vaccine and where is the vaccine manufactured? 2](#_Toc488755545)

[How long has the HPV vaccine been in use? 2](#_Toc488755546)

[How many people have received the HPV vaccine? 2](#_Toc488755547)

[Is the vaccine safe? 2](#_Toc488755548)

[How can I be sure this a high-quality vaccine? 2](#_Toc488755549)

[How can I be sure the vaccine has not expired? 2](#_Toc488755550)

[What are the long-term consequences of the vaccine? 2](#_Toc488755551)

[Does the vaccine have any side effects and, if so, what are they? 2](#_Toc488755552)

[How many people experience side effects? 2](#_Toc488755553)

[Can HPV vaccination cause an allergic reaction? 2](#_Toc488755554)

[How can I be sure that my child will not experience any serious side effects? 2](#_Toc488755555)

[Is a health check needed before getting the vaccine? 2](#_Toc488755556)

[Is a health check needed after immunization? 2](#_Toc488755557)

[Who should get the HPV vaccine? 2](#_Toc488755558)

[Why is the vaccine often only given to girls? 2](#_Toc488755559)

[Should boys also be vaccinated if they have access to the vaccine? 2](#_Toc488755560)

[When should my child get vaccinated? 2](#_Toc488755561)

[Would it be better to wait until my daughter is older? 2](#_Toc488755562)

[What will happen if my daughter/son is not vaccinated? 2](#_Toc488755563)

[I did not have the vaccine, and I do not have cervical cancer. Why should my daughter be vaccinated? 2](#_Toc488755564)

[Will the vaccine have a negative influence on my daughter’s sexual behaviour or choices later in life? 2](#_Toc488755565)

[Do girls become infertile from the HPV vaccine? 2](#_Toc488755566)

[Can I choose not to have my daughter vaccinated? 2](#_Toc488755567)

[Questions girls ask 2](#_Toc488755568)

[Why should I be vaccinated against HPV? 2](#_Toc488755569)

[How can I be sure the vaccine works? 2](#_Toc488755570)

[What will happen if I don’t get vaccinated? 2](#_Toc488755571)

[Can I get cancer from the vaccine? 2](#_Toc488755572)

[Will the vaccine affect future pregnancies or my chances of getting pregnant? 2](#_Toc488755573)

[Does it hurt to get the vaccine? 2](#_Toc488755574)

[What part of my body will I get the injection in? 2](#_Toc488755575)

[My skin is red and sore where I got the shot. Is this normal? 2](#_Toc488755576)

[No one in my family has had cervical cancer. Is it still relevant for me to get the vaccine? 2](#_Toc488755577)

[How does the vaccine work? 2](#_Toc488755578)

[I am older than 14. Is it still worth getting vaccinated? 2](#_Toc488755579)

[I am in a steady relationship and only have one sexual partner. Does it still make sense to get vaccinated? 2](#_Toc488755580)

[I had an HPV infection but my latest PAP test was clean. Am I now immune to HPV? 2](#_Toc488755581)

[I have a chronic health condition. Can I still get vaccinated? 2](#_Toc488755582)

[Should I take an anti-histamine before getting vaccinated? 2](#_Toc488755583)

[Questions health care providers, journalists and policymakers ask 2](#_Toc488755584)

[Is HPV vaccination still in an experimental stage? 2](#_Toc488755585)

[Does the available evidence justify the introduction of this vaccine into routine immunization? 2](#_Toc488755586)

[Which countries have already introduced the vaccine? 2](#_Toc488755587)

[Has the introduction of HPV been a success? 2](#_Toc488755588)

[What impact has the HPV vaccine had so far? 2](#_Toc488755589)

[Is there any proof that the vaccine reduces incidence of cervical cancer? 2](#_Toc488755590)

[Is there any evidence that the benefit of getting the vaccine is higher than the risk of potential negative side effects? 2](#_Toc488755591)

[Can HPV vaccination cause Postural Orthostatic Tachycardia Syndrome (POTS)? Is there any evidence available to support or disprove a possible link between HPV vaccination and POTS? 2](#_Toc488755592)

[Does vaccination cause autism? 2](#_Toc488755593)

[Can the vaccine affect fertility? 2](#_Toc488755594)

[Why do different countries give the vaccine to girls at different ages? 2](#_Toc488755595)

[Why are boys not given the vaccine in most countries? 2](#_Toc488755596)

[Why have some countries added HPV vaccination to their routine immunization schedules? 2](#_Toc488755597)

[Why is HPV vaccine offered free of charge only to a specific age group of girls? 2](#_Toc488755598)

[Why is the vaccine being introduced now? 2](#_Toc488755599)

[Why is only the quadrivalent vaccine offered in my country? Why not one that covers more HPV types? 2](#_Toc488755600)

[Why is the vaccine not offered to children under nine? 2](#_Toc488755601)

[How long is the vaccine effective? 2](#_Toc488755602)

[Is regular cervical cancer screening still necessary for women who have received the vaccine? 2](#_Toc488755603)

# Questions parents ask

## What is HPV?

HPV stands for human papillomavirus. This is a group of viruses that infect the skin or various mucous membranes (such as in the mouth or cervix). The majority of infections are not harmful, but the most common types of HPV can cause genital warts, cervical cancer and other diseases.

HPV is very common: about 80% of people will be infected with one or more types of the virus at some time in their lives.

## How does a person get HPV?

HPV is spread through direct, skin-to-skin, contact with an infected area. About 30 types of HPV are transmitted through sexual activity (out of a total of more than 200 types). This can be any intimate contact with an infected area, such as during sexual intercourse or genital touching.

In rare cases the virus can be transmitted during childbirth from an infected mother to her newborn. This type of transmission can lead to a rare but serious disease of infants called Recurrent Respiratory Papillomatosis (RRP).

HPV is not hereditary: a person’s risk of becoming infected with the HPV virus or developing HPV-related diseases is not influenced by their genes or family history of the disease.[[1]](#footnote-1)

## How common is HPV?

HPV is the most common sexually transmitted disease. About 80% of men and women will become infected at some point in their lives, and it is especially common among sexually active men and women up to age 25.

## Is the human papillomavirus (HPV) dangerous?

Yes, the virus can be dangerous.

12 HPV types are known to cause cancer. Each of these types is easy to contract and pass on to others. In most cases the infection does not cause any symptoms, so the person does not know he or she is infected. The infection usually lasts 1-2 years. However at least 1 out of 100 infections does not go away and if the infected area is not detected and removed on time it can slowly develop into cancer.

Cervical cancer is the most common type of cancer caused by HPV, and the fifth most common cancer in women in the WHO European Region. Early detection and treatment of precancer abnormalities through improved screening programmes help to prevent cervical cancer in women, but more than 28 000 women still die from the disease every year in the European Region.

Some HPV types can also lead to cancer of the anus, vulva, vagina, penis or throat. Other HPV types cause 90% of genital warts, a painful and difficult-to-treat condition affecting both men and women.

## What does the HPV vaccine do?

The HPV vaccine contains particles that mimic the most common types of the virus. These particles are not live virus and cannot cause infection, but when the vaccine is injected into a person’s body, his or her immune system responds as if it was the actual virus. By building antibodies against these particles, the body builds a defense system that will fight off the real virus if it ever appears. This system works so well that the vaccine is nearly 100% effective in preventing any future infections with the same types of HPV.

See also the video “How the HPV vaccine works”: https://www.youtube.com/watch?v=qF7pBzU4D20&t=4s

## What is in the HPV vaccine?

Vaccines are made up of virus-like particles that contain the protein coat of the virus, without any of the genetic materials from the virus itself. By resembling the virus, the vaccine stimulates the immune system to produce protective antibodies against HPV.

To be as effective as possible, the vaccine also contains tiny amounts of adjuvants (substances that help enhance the body’s immune response). These include mineral salts, water and materials such as aluminum sulfate (alum) – a substance we are already regularly exposed to through the air, food and cosmetics such as deodorants.

Contrary to some rumours, currently available HPV vaccines do not contain Thiomersal (an authorized and harmless preservative used in some other vaccines), nor any other form of mercury.

## Why get the HPV vaccine?

Vaccination offers the best possible protection against serious diseases, including cervical cancer. Each vaccinated person also helps others by stopping the spread of the virus.

HPV is so common that about 80% of unvaccinated men and women will be infected at some time in their lives. Sexually transmitted HPV is especially widespread among young people up to age 25. A person who is vaccinated before becoming sexually active will be protected from the most common and dangerous types of the virus, and will not go on to spread the virus to others.

Cervical cancer is the most common disease caused by HPV. Over 67 000 women were diagnosed with cervical cancer and 28 000 died from the disease in the WHO European Region in 2012.[[2]](#footnote-2) In that same year, about 266 000 women died of cervical cancer worldwide, accounting for 8% of all female cancer deaths. Unlike most cancers, cervical cancer is more likely to develop among young women aged 20–45 than among older women.

Vaccination protects young girls against human papillomaviruses that cause up to 95% of cervical cancers at any age. However, regular cervical cancer screening is very important – for both vaccinated and unvaccinated women - because HPV vaccines prevent the majority of cervical cancers but not all of them. In combination, vaccination and cervical cancer screening programmes provide reliable protection against cervical cancer.

HPV is also linked to cancer of the vulva, penis, anus, head and neck and to genital warts.

It is always better to prevent an HPV infection than to try and treat the diseases it can cause.

## Is the vaccine effective for someone who is already sexually active?

This is possible, but effectiveness will depend on his or her past exposure to the virus.

HPV vaccines target the most common and dangerous types of the virus. The protection provided by the vaccine is strongest for the HPV types that a person has not yet been exposed to. In general, people contract one or more types of the virus soon after becoming sexually active. So to benefit fully from the vaccine, it is best to be vaccinated before initiating sexual activity.

## What causes cervical cancer?

Virtually all cervical cancer cases start with an HPV infection.

HPV is a very common, sexually transmitted virus that can infect skin and mucosal tissues, including the lining of the cervix in women. Most cervical infections clear up on their own within 1-2 years, but up to 1 in 10 infections does not and instead may develop into a cluster of abnormal cells called a pre-cancerous lesion. At this stage, the woman may have no symptoms and not even know she is infected, but if the lesion is not detected and removed it can slowly develop over years or even decades into cervical cancer.[[3]](#footnote-3)

## Is it possible to avoid getting HPV?

HPV is transferred through intimate contact, so the only sure way to avoid HPV infection is to never engage in sexual activity. Even if a person has only one sexual partner, that person could already be infected without knowing it because the virus often has no symptoms.

Using condoms and other barrier contraception methods can reduce the risk of HPV transmission. But these methods are only partially effective, because they may not cover all areas of infected skin.

The best strategy is vaccination, if possible before becoming sexually active, in combination with periodic screening for cervical cancer for women. The HPV vaccine will not protect against all types of HPV, but depending on which HPV vaccine is used, it will protect against the types that cause 71-90% of cervical cancer cases, and up to 90% of genital warts.

## Is vaccination the only way to prevent HPV infection and cervical cancer?

HPV vaccination, combined with regular screening, is the best strategy to avoid developing cervical cancer.

Everyone who is sexually active has a high risk of becoming infected with HPV. Some methods of barrier contraception (such as condoms) can help avoid infection, but they are not 100% effective because they may not cover all areas of infected skin.

HPV vaccination protects against the types of the virus that cause up to 90% of cervical cancer cases. In addition all women, including those who have been vaccinated, should be screened regularly. Screening can detect pre-cancerous or cancerous growths caused by HPV so they can be removed as early as possible.

## Is it possible to get tested for HPV and cervical cancer?

Yes, regular testing is possible and very important.

There are three different methods of screening for HPV and cervical cancer:

* The HPV test is used to detect types of HPV that may cause cancer.
* The widely used PAP test is used to detect abnormal cell growth (precancerous or cancerous lesions).
* Visual inspection of the cervix may also be used to detect visible lesions.

These tests, combined with effective treatment of any precancerous cells they detect can prevent many women from developing and potentially dying from cervical cancer.

Unfortunately, screening programmes cannot detect or prevent all cases of cervical cancer. Even countries with an effective cervical cancer screening programme have significant numbers of cervical cancer deaths.

This is why *vaccination in combination with regular screening* offer the most effective way for women to protect themselves against cervical cancer.

## How common is cervical cancer among those who don’t get vaccinated?

Cervical cancer is the fourth most common cancer in women worldwide, and the fifth most common in the WHO European Region. Over 67 000 new cases and 28 000 deaths caused by cervical cancer were reported in the WHO European Region in 2012.[[4]](#footnote-4)

## Do HPV vaccines work?

Yes.

HPV vaccination is having a clear impact in reducing the spread of HPV. The immediate signs of this are reductions in the number of women with cervical lesions and a dramatic drop in the number of men and women suffering from genital warts. Whenever HPV transmission is reduced, this will be followed over a period of several years or decades by a drop in cases of cervical and other HPV-related cancers.

Rapid reductions up to 90% in HPV infections and genital words in teenage girls and young women have been demonstrated by studies conducted in Australia, Belgium, Germany, Sweden, United Kingdom, United States and New Zealand.

## Is there more than one HPV vaccine, and what is the difference between them?

Three different HPV vaccines are currently in use:

* ***Gardasil***, made by Merck Sharp & Dohme (sometimes called MSD or Merck) and licensed for use in 2006, protects against 4 types of HPV.
* ***Cervarix***, made by GlaxoSmithKline (sometimes called GSK) and licensed in 2007 protects against 2 types of HPV.
* ***Gardasil 9***, made by MSD and licensed in 2014, protects against 9 types of HPV.

Each country’s national regulatory authority decides which vaccines will be available in that country. All three vaccines are highly efficacious in preventing cervical cancer and most other HPV-related types of cancer, as long as the recommended number of doses is taken. The two Gardasil vaccines also prevent genital warts.

If more than one type of HPV vaccine is available in your country, you can discuss with your health care provider which vaccine is the best option for you or your child. Immunization experts do not recommend getting more than one series of HPV vaccines.

## Which HPV types does the vaccine protect against?

There are many types of HPV - more than 200 have been discovered so far. The three available vaccines target the most common and dangerous types of the virus. The vaccines are classified as bivalent (protecting against 2 HPV types), quadrivalent (protecting against 4 HPV types) and nonavalent (protecting against 9 HPV types).

The following table shows which HPV types each of the vaccines protects against.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name of vaccine | Valency | HPV subtypes in the vaccine | Proportion cervical cancer cases caused by these types | Proportion of genital warts caused by these types |
| Cervarix | bivalent | 16,18 | 71% | No |
| Gardasil | quadrivalent | 6, 11,  16,18 | 71% | 90% |
| Gardasil 9 | nonavalent | 6, 11,  16,18,  31, 33, 45, 52, 58 | 90% | 90% |
|  |  |  |  |  |

About 30 separate types of HPV are sexually transmitted. Some are considered high risk for developing into cancers. Other types that are considered low risk for cancer are responsible for genital warts. All three vaccines protect against HPV types 16 and 18, which cause about 71% of cervical cancer cases and most other HPV-related cancers. Gardasil and Gardasil 9 also protect against types 6 and 11, which cause 90% of genital warts. Gardasil 9 also protects against an additional five types (31, 33, 45, 52, 58), which together with types 16 and 18 cause 90% of cervical cancer cases. [[5]](#footnote-5)

In addition, HPV vaccines provide some cross-protection against types not included in the vaccines.

## Why get vaccinated if the vaccine only covers some of the circulating HPV types?

HPV vaccines protect against the HPV types which are most common and most likely to cause cancer and genital warts. They also provide some cross-protection against types they do not contain.

Cervarix protects against the two types (16 and 18) which cause 71% of cervical cancer globally. Gardasil (quadrivalent) protects against these same types, as well as two types which cause up to 90% of genital warts. Gardasil 9 protects against these four and in addition against another five types, which increases its protection to 90% of types that cause either genital warts or cervical cancer.

## Who produces the vaccine and where is the vaccine manufactured?

Gardasil and Gardasil 9 vaccines are manufactured by Merck Sharp & Dohme (sometimes called MSD or Merck), whose corporate headquarters are located in the United States. Cervarix is manufactured by a company called GlaxoSmithKline, whose headquarters are in the United Kingdom.

These companies have manufacturing facilities in many countries worldwide, where the vaccines are produced. All factories that produce HPV vaccines are regularly inspected by national and international authorities, including WHO.

## How long has the HPV vaccine been in use?

HPV vaccines have been available since 2006.

The quadrivalent HPV vaccine (against 4 HPV types) was introduced in 2006, the bivalent (against 2 types) in 2007 and the nonavelent (against 9 types) in 2014.

## How many people have received the HPV vaccine?

Since 2006, when the vaccine was first introduced, over 100 million people have been vaccinated with over 270 million doses of HPV vaccines around the world.[[6]](#footnote-6) HPV vaccination is part of the routine immunization schedule in 71 countries so far.

## Is the vaccine safe?

Yes, all three HPV vaccines are among the safest and most effective vaccines ever licensed.

Each HPV vaccine was thoroughly tested for safety and effectiveness in clinical trials before being introduced to the general public. Monitoring has also continued since the vaccines were introduced; and after 270 million doses of HPV vaccines administered in 71 countries so far, the vaccines continue to have very good safety profiles.

The Global Advisory Committee for Vaccine Safety (GACVS) regularly reviews the scientific evidence on the safety of HPV vaccines provided by studies conducted around the world. Any serious event following immunization that could potentially be associated with the vaccine is investigated and the Committee looks at how often they occurred before and after introduction of the vaccine. In January 2016, the Committee concluded that there was no evidence to support any serious safety concerns related to the use of these vaccines. The European Medicines Agency also conducted an independent assessment and concluded that the vaccines are safe and effective.

Video: How vaccines work   
https://www.youtube.com/watch?v=qF7pBzU4D20&t=4s

World\_Health\_Organization. Global Advisory Committee on Vaccine Safety, 2-3 December 2015. Weekly epidemiological record. 2016;91(3):21-32.

WHO Position Paper on HPV immunization (WER, 2017)   
http://www.who.int/immunization/policy/position\_papers/hpv/en/

European\_Medicines\_Agency. Assessment report EMA/762033/2015 Human papillomavirus (HPV) vaccines. <http://www.ema.europa.eu/docs/en_GB/document_library/Referrals_document/HPV_vaccines_20/Opinion_provided_by_Committee_for_Medicinal_Products_for_Human_Use/WC500197129.pdf>.

## How can I be sure this a high-quality vaccine?

WHO, the European Medicines Agency, national regulatory authorities and many others take the safety of vaccines very seriously. Rigorous systems have been put in place to ensure the quality and safety of vaccines during all steps of testing, production, transportation and administration. These systems also ensure that any potential safety issue is reported and properly investigated.

Before any HPV vaccine is licensed, it is tested in clinical trials that carefully look for side effects. In clinical trials the vaccine is given to thousands of volunteers, and the outcomes for this group are compared to the outcomes for a group of people who did not receive the vaccine.

After a vaccine is shown to be safe and effective, the WHO “pre-qualifies” the vaccine’s manufacturer and its factories. WHO and national regulatory authorities inspect the manufacturing facilities and process, and test the consistency of vaccine batches to ensure that each batch is the same. Reassessments are carried out at regular intervals, and WHO follows up on any reported inconsistencies.

The high manufacturing and quality standards are the same in every country where HPV vaccines are produced.

## How can I be sure the vaccine has not expired?

The expiry date of each vial of vaccine is printed on the label. Parents, caregivers or patients can ask their doctor to show them the label. Health care facilities have systems to make sure that all medicines, including vaccines, have not passed the expiry date and are safe to use.

## What are the long-term consequences of the vaccine?

10 years have passed since the first countries introduced routine immunization of girls against HPV. Protection against the virus is still strong among those who were vaccinated 10 years ago, and shows no signs of waning.

Scandinavian countries and the United States periodically examine their computerized medical records of millions of people who have received the vaccine, to see if there are any unexpected negative health outcomes among women who have received HPV vaccines. They have not found any long-term negative consequences. [[7]](#footnote-7)

## Does the vaccine have any side effects and, if so, what are they?

Like other vaccines and medicines, the HPV vaccine often produces mild side effects, such as redness, swelling or soreness in the arm where the injection is given. Some people also experience headache, mild fever, aches in joints or muscles or temporary nausea. These side effects usually last less than a day and are not dangerous.

Occasionally, a person may faint when given a vaccine or other injection. This is more common when many young people are vaccinated as a group, such as in a school setting. This reaction is thought to be due to stress and anxiety, not to the vaccine itself.

About one in a million people who receive a vaccine of any kind will experience an allergic reaction (such as anaphylactic shock). Therefore, as a precaution a person receiving the vaccine should stay sitting or lie down for 15 minutes afterwards. If they feel light headed or have any changes in hearing or vision right after vaccination they should tell the health care provider.

Unfortunately rumors linking HPV vaccination to severe side effects or chronic health problems circulate on social media and among teenagers. Extensive studies and ongoing safety monitoring of the over 270 million doses administered so far throughout the world do not support any such links.

## How many people experience side effects?

Reactions in the arm where the vaccine was given:

* + Pain is felt by about 8 in 10 people.
  + Redness or swelling is experienced by about 1 in 4 people.

Headache: About 1 in 3 people will develop a headache.

Fever:

* + Mild fever (100° F/38° C) is experienced by about 1 in 10 people.
  + Moderate fever (102° F/39° C) is experienced by about 1 in 65 people.

These mild side effects usually last a few hours to one day.

About one in a million people who receive a vaccine of any kind will experience a strong allergic reaction (such as anaphylactic shock). For this reason, health care providers should ask about allergies before giving a vaccine and the person vaccinated should stay seated in the clinic for 15 minutes afterwards for observation.

## Can HPV vaccination cause an allergic reaction?

Yes, but only for people with very specific allergies.

All medicines and vaccines (and some foods and insect bites) can cause allergic reactions, but allergic reactions to vaccines are very rare. The most serious allergic reaction, called anaphylactic shock, occurs in about one in a million people who receive a vaccine of any kind.

Some people may have allergic reactions to ingredients within the vaccine. For example, one component of Gardasil vaccines is yeast, so people with a yeast allergy should tell their health care worker before receiving the vaccine. The Cervarix vaccine has contact with latex, so it should not be given to anyone with an acute allergy to latex.[[8]](#footnote-8)

To prevent allergic reactions, patients and their caregivers should tell doctors about any existing allergies before receiving any vaccine. Health care providers should ask about allergies before giving a vaccine and the person vaccinated should stay seated in the clinic for 15 minutes afterwards for observation.

## How can I be sure that my child will not experience any serious side effects?

It is very unlikely that your child will experience any serious side effects or anxiety-related reactions to HPV vaccination.

But there are several things a parent can do to help ensure that vaccination goes well for his or her child.

* Tell the clinic if your child has an allergy to yeast or latex before the vaccine is given.
* Make sure your child stays seated for 15 minutes in the clinic after receiving the vaccine, so the clinic staff can observe him or her and respond to any serious allergic reactions.
* After vaccination, you can expect the usual side effects (redness or soreness at the injection site) as well as possible fever or body aches. Reassure your child that these side effects are common and not dangerous.
* If anything unexpected occurs, report it to the doctor. All such reports will be taken seriously and investigated to see if the observed change is related to the vaccination or may have another cause.
* Finally, stay positive. Reassure your child that protection from cervical cancer is more important than the momentary discomfort of an injection.

## Is a health check needed before getting the vaccine?

No, a health check is not necessary.

There is no need for a person without existing health issues to get a health check before getting the vaccine. However, be sure to discuss with your health provider whether getting the vaccine is advised if you:

* are scheduled to receive your second dose of an HPV vaccine but had an allergic reaction after receiving the first dose;
* are allergic to yeast or have other severe allergies.

The vaccine has not been tested among pregnant women, so they should delay getting vaccinated or finalizing their vaccination schedule until after the pregnancy.

## Is a health check needed after immunization?

No, there is no need for a health check after immunization.

However, women who receive the vaccine should still participate in routine cervical cancer screening as recommended in their country. This is because HPV vaccines can prevent most, but not all HPV types that can lead to cervical cancer. Also, a person who receives the vaccine after becoming sexually active may have already become infected with one or more types contained in the vaccines.

## Who should get the HPV vaccine?

WHO recommends as a priority the vaccination of girls at the age of 9 to 14 years. When the vaccine is first introduced in a country, it is recommend that all girls aged 9-14 be offered the vaccine, and if feasible all those up to 18 years of age. Most countries share this recommendation, but some recommend vaccination of all girls and young women up to the age of 26. Some countries also recommend the immunization of boys and young men. People who are older than the recommended age in their country and already sexually active may still get the vaccine. This will protect them against HPV types they have not yet come in contact with.

## Why is the vaccine often only given to girls?

Cervical cancer is the most common disease caused by HPV. Protecting women from this potentially fatal disease is therefore the main aim of HPV vaccination programmes. WHO and national authorities in most countries recommend that vaccination against HPV be offered to girls and women as the first priority. Protecting women from HPV also indirectly protects their partners, and this community protection or ‘herd immunity’ has shown to be very effective in impeding the spread of the virus.

Each country makes its own decision about who should be given the HPV vaccine, based on the national disease burden and available funding. If they have enough capacity and funding, a country may decide to expand coverage to girls older than 14 and to boys. So far, 11 countries, including Austria, Switzerland and parts of Italy offer the vaccine to both boys and girls.

## Should boys also be vaccinated if they have access to the vaccine?

Although cervical cancer is the most common disease caused by HPV, boys can also benefit from receiving the vaccine.

HPV infection can cause several types of cancer and genital warts in men, and men are just as likely as women to become infected with HPV soon after they begin sexual activity. The highest prevalence of HPV infection is among HIV-positive men who have sex with men. All three HPV vaccines work just as well in men as in women, and vaccinating men will help protect their partners as well. [[9]](#footnote-9)

## When should my child get vaccinated?

The best time for a child to be vaccinated is from 9 to 14 years of age. The vaccine gives the strongest immune response at that age, and it is most effective if given before a person becomes sexually active.

The vaccine has not been tested and is not licensed for children under 9.

## Would it be better to wait until my daughter is older?

No.

There is no reason to wait until your daughter is older than the recommended 9–14 years of age to get the vaccine. The HPV vaccine produces a stronger immune response at this age than later in life and it is most effective if given before a person comes in contact with the targeted HPV types. Also only 2 doses are needed at that age. HPV is most prevalent among people younger than 25 of age, so many become infected within just a few years of starting sexual activity. This is true even for people who have only one sexual partner.

If a girl does not start the 2-dose series of HPV vaccination before turning 15, she will need a third dose to ensure she is fully protected. This is because the immune response is best at the recommended age.

## What will happen if my daughter/son is not vaccinated?

Anyone who is not vaccinated has a high risk of becoming infected with HPV and passing the virus on to others. HPV infections can cause genital warts or lead to several types of cancer.

Over 80% of people who are not vaccinated before they become sexually active will become infected with at least one type of HPV in their lifetime. The most common infection for women occurs in the cervix. Most of these infections (about 90%) clear up on their own, but those that do not can develop into pre-cancerous lesions and over time lead to cervical cancer. HPV infections outside the cervix can develop into cancer of the vagina or vulva. Infections in men can develop into cancer of the penis, anus or throat. Certain types of HPV cause genital warts among both men and women.

It is vitally important for both vaccinated and unvaccinated women to obtain regular cervical cancer screening so that any pre-cancerous lesions can be detected and removed before they can develop into cancer.

## I did not have the vaccine, and I do not have cervical cancer. Why should my daughter be vaccinated?

There is no link between family history and risk of developing cervical cancer.

If no one in your family has had cervical cancer this does not mean that your child has a lower risk of developing the disease. Most sexually active people (about 80%) will become infected with one or more HPV types in their lifetimes, and genes do not affect who will go on to develop HPV-related diseases. WHO recommends that all girls be vaccinated against HPV and that all women be routinely screened to prevent cervical cancer from developing.

## Will the vaccine have a negative influence on my daughter’s sexual behaviour or choices later in life?

No, there is no evidence that the vaccine will impact future behaviour.

Some parents worry that giving their children the HPV vaccine may lead them to have sex sooner or to have more partners, but there is no evidence supporting this. Studies show that girls who have received the HPV vaccine do not start having sex sooner and do not have more sexual partners than girls who do not get the vaccine.[[10]](#footnote-10) Giving a child the HPV vaccine reduces or eliminates the risk of cervical and other cancers, cervical lesions, and genital warts and is a positive step to improve your child’s future health and wellbeing.

## Do girls become infertile from the HPV vaccine?

No.

HPV vaccination does not affect a girl’s risk of getting pregnant or in any way impact future pregnancies. It also does not affect the fertility of boys or men. Vaccination is an important first step to prevent the long-term consequences of HPV infection, which can include cervical cancer, infertility or even death.

## Can I choose not to have my daughter vaccinated?

Most countries allow children and parents to refuse HPV immunization. People should understand that by choosing not to vaccinate, they are exposing their daughter/son to the risk of developing cancers of the cervix, vagina, vulva, anus, penis, throat, head or neck as well as genital warts.

# Questions girls ask

## Why should I be vaccinated against HPV?

HPV vaccines are safe and effective in protecting girls and boys from a dangerous virus.

* HPV is the most common sexually transmitted infection in the world. Almost 80% of sexually active people will get infected with one or more HPV types in their lifetime.
* HPV infection can lead to several types of cancer and genital warts.
* Cervical cancer is the most common type of cancer caused by HPV, and it is the fourth most common cancer in women worldwide.
* Vaccination against HPV greatly reduces your risk of getting HPV infections and the serious diseases HPV can cause.
* By getting the vaccine, you will protect not only yourself, but also your current or future partner from HPV infection.
* HPV vaccines are proven safe and effective.

## How can I be sure the vaccine works?

The HPV vaccine is one of the most effective vaccines ever developed. Studies show that nearly 100% of individuals vaccinated with the HPV vaccine develop enough antibodies to protect themselves against the HPV types present in the vaccine.

## What will happen if I don’t get vaccinated?

Nearly all unvaccinated girls and boys will become infected with HPV at some point in their lives and some will go on to develop HPV-related diseases.

About 80% of people who have not had the HPV vaccine before they become sexually active will become infected with at least one type of HPV, even if they have only one sexual partner in their lifetime. Most infections (about 90%) clear up on their own. But there are many types of HPV, so people who recover from one infection can get infected with other HPV types in the future.

If an HPV infection does not clear up, it can develop into a pre-cancerous lesion (cluster of abnormal cells) and eventually, after years or even decades, the lesion can develop into cancer. The most common HPV-related disease is cervical cancer, but the virus can also cause cancer of the cervix, vulva, penis, anus, throat and neck as well as genital warts.

## Can I get cancer from the vaccine?

No.

Vaccination against HPV ***cannot*** ***cause*** cancer, but it can ***prevent*** certain cancers by preventing infection with the types of HPV responsible for them. The vaccine contains particles that mimic HPV, but they are not live virus and cannot cause infection.

## Will the vaccine affect future pregnancies or my chances of getting pregnant?

No.

HPV vaccination will not affect your chances of getting pregnant or in any way impact future pregnancies.

*Not* getting the vaccine will put your future at greater risk. Almost all sexually active people (approximately 80%) will become infected with one or more HPV types and some will go on to develop an HPV-related cancer.

Cervical cancer, the most common HPV-related disease for women, can be fatal or lead to long-term health problems such as infertility.

## Does it hurt to get the vaccine?

Injection with the HPV vaccine feels like any other shot, and the arm used for the injection may feel sore for a day or so.

## What part of my body will I get the injection in?

The injection is given in the upper, outer part of the arm. This is where most common vaccines are given.

## My skin is red and sore where I got the shot. Is this normal?

Yes.   
Redness, swelling and arm pain are common side effects of the HPV vaccine, as well as of many other vaccines. This should go away within a few hours to a day. If the pain or redness persists or you notice any other symptoms that are out of the ordinary, report this to your nurse or doctor.

## No one in my family has had cervical cancer. Is it still relevant for me to get the vaccine?

Yes.   
The risk of developing HPV-related cancers is not linked to a person’s genes, so your risk of getting cervical cancer are the same as anyone else’s, even if you have no family history of the disease.

## How does the vaccine work?

The vaccine helps the body develop immunity to HPV by imitating an HPV infection. When the vaccine is injected into your arm, your immune system responds as if this was the real virus and makes antibodies to fight it off. Once these antibodies are produced, they stay in the body for years or even decades and are ready to fight off any future infection with the real HPV virus.

## I am older than 14. Is it still worth getting vaccinated?

|  |
| --- |
| Yes, it is probably still worth getting vaccinated, but how well the vaccine works for you will depend on your age and sexual history.  Your body’s immune response to the vaccine will be strongest if you get the vaccine at the recommended age; and it is best to be vaccinated against HPV before becoming sexually active to be sure that you have not already been exposed to any of the HPV types targeted by the vaccine. However, |

the vaccine has been shown to be safe and effective in people up to the age of 45 for any targeted HPV types that they were not exposed to before getting the vaccine.[[11]](#footnote-11)

For this reason, some countries offer the vaccine to individuals beyond the recommended age. Keep in mind that if you get the first dose of HPV vaccine after the age of 15, you will need three doses rather than two to ensure that you are fully protected.

## I am in a steady relationship and only have one sexual partner. Does it still make sense to get vaccinated?

Yes.

Even people with only one sexual partner have high rates of HPV infection. While you may only have (or plan to have) one sexual partner, he or she may have had other sexual partners before you or during your relationship. Either of you may also have other partners in the future. Vaccination will protect both of you from becoming infected and passing the virus on to others.[[12]](#footnote-12)

## I had an HPV infection but my latest PAP test was clean. Am I now immune to HPV?

No. If you have recovered from an HPV infection, you are unlikely to become infected with the same HPV type again. But there are many types of HPV and immunity against one type does not protect you from contracting the others.

## I have a chronic health condition. Can I still get vaccinated?

In most cases, yes.   
However you should discuss the risks and benefits of vaccination with your health care provider.

## Should I take an anti-histamine before getting vaccinated?

No.   
Taking an anti-histamine before receiving the HPV vaccine is not recommended.

Before vaccinating, health care providers should ask their patients if they have ever had an allergic reaction to any vaccine or have any other allergies. Allergies to vaccines are rare but some vaccines contain substances or have been in contact with substances that people are allergic to. Gardasil and Gardasil 9 are made in yeast and it is possible that people with yeast allergies may have an allergic reaction. The Cervarix vaccine has contact with latex during the production process, so it should not be given to anyone with an allergy to latex.

# Questions health care providers, journalists and policymakers ask

## Is HPV vaccination still in an experimental stage?

No.

The three available HPV vaccines are not experimental vaccines. Each was tested in extensive clinical trials before being licensed. The first HPV vaccine was licensed in 2006, and since then more than 270 million doses of HPV vaccines have been distributed in 71 countries.

## Does the available evidence justify the introduction of this vaccine into routine immunization?

Yes.   
WHO, professional societies, and the health ministries in 71 countries supported by independent expert groups on immunization have examined the evidence on effectiveness, cost-effectiveness and safety of HPV vaccination and have concluded that routine introduction of an HPV vaccine is justified and strongly recommended.[[13]](#footnote-13)

Which countries have already introduced the vaccine?

Over 100 countries have licensed one or more HPV vaccines, and as of 31 March 2017, globally 71 countries (including 33 countries in the WHO European Region) have added HPV vaccination to their national immunization programme for girls, and 11 countries also for boys.[[14]](#footnote-14)

## Has the introduction of HPV been a success?

Yes. Countries with high uptake of HPV vaccines are seeing a clear decline in the rate of HPV infection and cervical abnormalities; a resulting drop in cervical cancer is expected to become visible in the next few years. The same countries are also seeing a dramatic, over 90%, decrease in the prevalence of genital warts.[[15]](#footnote-15)

What impact has the HPV vaccine had so far?

HPV vaccination is having a clear impact in reducing the spread of HPV. The immediate signs of this are reductions in the number of women with cervical lesions and a dramatic drop in the number of men and women suffering from genital warts. Whenever HPV transmission is reduced, this will be followed over a period of several years or decades by a drop in cases of cervical and other HPV-related cancers.

Studies conducted so far demonstrate that the vaccine is very effective. Rapid reductions up to 90% in HPV infections and genital words in teenage girls and young women were demonstrated in Australia, Belgium, Germany, Sweden, United Kingdom, United States and New Zealand. Subsequently, as vaccinated cohorts began cervical screening, reductions in cervical abnormalities became apparent. For example in Australia and Denmark where HPV vaccine was introduced early and programmes achieved high coverage, studies showed reductions of 80% for high-grade cervical abnormalities, which are likely to lead to cancer if left untreated.

## Is there any proof that the vaccine reduces incidence of cervical cancer?

After 10 years of use and over 270 million doses administered, there is now ample proof that HPV vaccination is very effective in preventing the chronic infections that can lead to cervical cancer. A reduction in cervical cancer cases is expected within the next few years, as the first group of girls who were vaccinated as young teenagers reach the age during which cervical cancer begins to appear.

## Is there any evidence that the benefit of getting the vaccine is higher than the risk of potential negative side effects?

Yes.   
The benefits of HPV vaccination are far greater than the very minimal risks. The benefits include nearly 100% prevention of infection with the HPV types that cause 71-90% of cervical and other HPV-related cancers and (for Gardasil and Gardasil 9) 90% of genital warts. The risks are mild side effects like pain and redness at the injection site usually lasting less than a day. There is no evidence linking serious side effects to HPV vaccination despite careful monitoring since 2006 and over 270 million doses of HPV vaccines administered so far.

## Can HPV vaccination cause Postural Orthostatic Tachycardia Syndrome (POTS)? Is there any evidence available to support or disprove a possible link between HPV vaccination and POTS?

No.

There is no evidence to suggest a link between Postural Orthostatic Tachycardia Syndrome (POTS) and HPV vaccination.

POTS is a condition that causes lightheadedness or fainting and a rapid increase in heartbeat upon standing. The cause is unknown, but doctors think POTS may be associated with a number of medical conditions including: a recent viral illness, prolonged physical inactivity, chronic fatigue syndrome and nervous system problems.

In 2014–2015 rumours in Denmark that HPV vaccines caused POTS seriously harmed the Danish HPV immunization programme. The data related to vaccination and to the syndrome were reviewed by the European Medicine Agency and the WHO Global Advisory Committee on Vaccine Safety, and data from the United States were reviewed by the United States Centers for Disease Control and Prevention (CDC). In November 2015, the European Medicine Agency completed a detailed [review of available POTS data](http://www.ema.europa.eu/docs/en_GB/document_library/Press_release/2015/11/WC500196352.pdf) from young women who received HPV vaccines. The review found that the evidence does not support a causal link between HPV vaccines and POTS.[[16]](#footnote-16) The risk of developing POTS was not increased by HPV vaccination.

About 80 million doses of Gardasil were administered in the United States in the period from June 2006 through September 2015. CDC monitoring in this period through the Vaccine Adverse Event Reporting System (VAERS) again did not detect any increase in incidence of POTS following HPV vaccination.[[17]](#footnote-17)

## Does vaccination cause autism?

Many small and large-scale studies have looked for a link between any vaccination and autism, but no link has ever been found. Moreover, studies have shown that autism does not occur any more frequently in infants born to mothers who have received the HPV vaccine than in mothers who have not received the vaccine.[[18]](#footnote-18)

## Can the vaccine affect fertility?

No.

HPV vaccines do not affect fertility. Clinical trials before the first HPV vaccine was licensed in 2006 and safety monitoring and studies since its introduction have confirmed that the vaccine does not cause any reproductive problems in women.[[19]](#footnote-19)

In fact, the HPV vaccine helps to protect fertility by preventing pre-cancerous cervical lesions and cervical cancer. Surgical treatment of pre-cancerous cervical lesions can lead to premature labour and loss of a foetus, and treatment for cervical cancer (removal of the cervix and uterus, chemotherapy and/or radiation) leaves a woman unable to bear more children.

## Why do different countries give the vaccine to girls at different ages?

WHO recommends that two doses of an HPV vaccine be given to 9–14-year-old girls as a priority. Once programmes for this group are successfully set up, a country may decide to expand coverage to older adolescents and young women and boys. Each country makes its own decision about who should be given the HPV vaccine, based on the national context. In some countries the HPV vaccine is given in school-based programmes at a particular grade in school and the age recommendations may be based on that. Some countries offer vaccines to a restricted age group of girls only, while others encourage and pay for immunization of all girls and women up to age 26 as a “catch-up” immunization.

## Why are boys not given the vaccine in most countries?

The primary goal of HPV vaccination is to prevent cervical cancer. Investing in high coverage among girls of the recommended age (9–14) is considered by WHO to be the most effective use of resources to achieve this goal. However, HPV vaccination has additional benefits for both women and men, and if countries have the resources they may choose to offer the vaccine to boys as well as girls.

## Why have some countries added HPV vaccination to their routine immunization schedules?

Countries that have added the HPV vaccine to their routine immunization schedules see protecting their population against cervical cancer and other diseases caused by HPV as a high priority. In making the decision to introduce the vaccine, they have considered the burden of HPV disease, the pattern of the infection in their country and the efficacy, cost-effectiveness and affordability of the vaccine.

WHO recommends that all countries add HPV vaccine to their routine vaccination programme.

## Why is HPV vaccine offered free of charge only to a specific age group of girls?

All countries have a national immunization programme, and the vaccines given under that programme are usually given free of charge to the recommended target group for each vaccine. The national immunization programme in each country determines which groups should get the vaccine and whether the government will pay for it. Ministries of health, with the help of independent committees of experts on immunization, decide who should be vaccinated based on the pattern of disease in that country, how much vaccine the country can afford, and whether it is cost-effective for the government to pay for vaccination.

WHO recommends that the HPV vaccine be given to 9–14-year-old girls as a first priority. Some countries follow this recommendation and offer HPV vaccination to girls in this age group at no cost to the individual. Others extend the offer to include boys and older adolescents or adults up to 26 years old. In some countries, the vaccine may be available at a cost to individuals not covered by the routine programme.

## Why is the vaccine being introduced now?

HPV vaccination has been proven to be effective as well as cost-effective in reducing the human and financial burden of HPV infections.

Once a vaccine has been thoroughly tested and then approved, each country must decide whether it is feasible and affordable to add it to their immunization programme. An independent body of experts looks carefully at the rate of infection in the country, the effectiveness of the vaccine, who will be eligible and whether the country has sufficient resources available. The new vaccine must also go through a separate licensing procedure in each country, which can take several years. Introducing a new vaccine within a country must also be prepared well in advance so that the public is aware of the benefits of the new vaccine, they know when it should be administered, and to ensure that enough vaccines are available to meet the demand.

More than 100 countries have licensed one or more HPV vaccines. The first countries introduced the vaccine in 2006, and as of 31 March 2017, globally 71 countries (including 33in the WHO European Region) have added HPV vaccination to their national immunization programmes for girls. 11 of these countries have also introduced it for boys.[[20]](#footnote-20). More countries plan to introduce the vaccine in the coming years.

## Why is only the quadrivalent vaccine offered in my country? Why not one that covers more HPV types?

All three HPV vaccines in use are safe and effective in targeting the two most common HPV types (16 and 18) that are responsible for 71% of all cervical cancer cases globally. Two of the three vaccines also target types 6 and 11, which cause 90% of genital warts. The newest HPV vaccine, Gardasil 9, also offers protection against several less common HPV types, which extends its protection to HPV types responsible for 90% of all cervical cancer cases. The choice of which vaccine to license in a particular country and when to introduce it into the national vaccination programme depends on several factors, including the time required to license a new vaccine, cost and the prevalent HPV types.

Every vaccine must be licensed in a particular country before it can be used there; and the licensing procedure takes time. Gardasil 9 (which covers nine HPV types), was approved for public use in 2014. It may take several more years before it is licensed and available in each country that has chosen to introduce it.

## Why is the vaccine not offered to children under nine?

When the HPV vaccine was developed, the duration of protection was not known and the vaccine developers and health officials were concerned that if young children were immunized, the protection offered by the vaccine might not last long enough to protect them throughout the most at-risk period of sexual activity (up to age 25). Therefore they chose to immunize children fewer years before the start of sexual activity.

Recent evidence now shows that the duration of protection is at least 10 years and will most likely be much longer. Some scientists are therefore urging that research be done on the effectiveness of offering the vaccine to younger children.

## How long is the vaccine effective?

Because the first vaccine was introduced in 2006, the full duration of protection is not yet known. New evidence shows that people vaccinated more than 10 years ago still have complete protection against the HPV types in the vaccine used, and are therefore still protected from developing pre-cancerous cervical lesions, genital warts and other diseases caused by these HPV types. There is no sign that this protection is decreasing in the currently vaccinated population and many experts believe the vaccine will prove to be effective for several decades.[[21]](#footnote-21)

## Is regular cervical cancer screening still necessary for women who have received the vaccine?

Yes.   
Women who have received the vaccine should still be screened for cervical cancer as recommended in their country. The vaccine protects against most (71-90%), but not all, of HPV types that can cause cancer. Cervical cancer screening programmes like PAP smears and visual inspections can find lesions caused by the remaining types early, so they can be treated before they become cancerous. Also the vaccine will not protect women against types with which they were already infected before receiving the vaccine.

1. Marcia L. Shew, Bree Weaver, Wanzhu Tu, Yan Tong, J. Dennis Fortenberry, and Darron R. Brown. High Frequency of Human Papillomavirus Detection in the Vagina Before First Vaginal Intercourse Among Females Enrolled in a Longitudinal Cohort Study *J Infect Dis. (2013) 207 (6): 1012-1015 first published online December 13, 2012 doi:10.1093/infdis/jis775* [↑](#footnote-ref-1)
2. Source: http://gco.iarc.fr/today/home [↑](#footnote-ref-2)
3. Bosch FX, Lorincz A, Muñoz N, Meijer CJ, Shah KV. The causal relation between

   human papillomavirus and cervical cancer. J Clin Pathol, 2002;55(4):244–265. [↑](#footnote-ref-3)
4. Source: http://gco.iarc.fr/today/home [↑](#footnote-ref-4)
5. Human Papillomavirus Vaccines: WHO Position Paper May 2017.   
   http://www.who.int/immunization/documents/positionpapers/en/ [↑](#footnote-ref-5)
6. #### Ref: Bruni, Laia et al. Global estimates of human papillomavirus vaccination coverage by region and income level: a pooled analysis.The Lancet Global Health, Volume 4, Issue 7 , e453 - e463 (2016)

   [↑](#footnote-ref-6)
7. https://www.cdc.gov/vaccinesafety/pdf/data-summary-hpv-gardasil-vaccine-is-safe.pdf [↑](#footnote-ref-7)
8. http://vaccine-safety-training.org/anaphylaxis.html [↑](#footnote-ref-8)
9. Smith JS et al. Age-specific prevalence of human papillomavirus infection in males:

   a global review. J Adolesc Health, 2011;48(6):540–552. [↑](#footnote-ref-9)
10. Sexual Activity–Related Outcomes After Human Papillomavirus Vaccination of 11- to 12-Year-Olds. Robert A. Bednarczyk, Robert Davis, Kevin Ault, Walter Orenstein, Saad B. Omer

    Pediatrics Nov 2012, 130 (5) 798-805; DOI: 10.1542/peds.2012-1516

    Liddon NC, Leichliter JS, Markowitz LE*. Human papillomavirus vaccine and sexual behavior among adolescent and young women. Am J Prev Med. 2012;42(1):44–52pmid:22176845* [↑](#footnote-ref-10)
11. Gravitt PE. The known unknowns of HPV natural history. *The Journal of Clinical Investigation*. 2011;121(12):4593-4599. doi:10.1172/JCI57149. [↑](#footnote-ref-11)
12. https://www.cdc.gov/std/hpv/stdfact-hpv.htm [↑](#footnote-ref-12)
13. #### Bruni, Laia et al. Global estimates of human papillomavirus vaccination coverage by region and income level: a pooled analysis. The Lancet Global Health , Volume 4 , Issue 7 , e453 - e463

    [↑](#footnote-ref-13)
14. WHO/ Immunization,Vaccines and Biologicals database, as of 31 March 2017. Available

    at http://www.who.int/entity/immunization/monitoring\_surveillance/VaccineIntroStatus.pptx,

    accessed June 2017. [↑](#footnote-ref-14)
15. Position paper [↑](#footnote-ref-15)
16. <http://www.ema.europa.eu/docs/en_GB/document_library/Press_release/2015/11/> WC500196352.pdf [↑](#footnote-ref-16)
17. https://www.cdc.gov/vaccinesafety/vaccines/hpv/hpv-safety-faqs.html [↑](#footnote-ref-17)
18. https://www.cdc.gov/vaccinesafety/concerns/autism.html [↑](#footnote-ref-18)
19. <https://www.cdc.gov/vaccinesafety/vaccines/hpv/hpv-safety-faqs.html#A6> [↑](#footnote-ref-19)
20. WHO/ Immunization,Vaccines and Biologicals database, as of 31 March 2017. Available

    at http://www.who.int/entity/immunization/monitoring\_surveillance/VaccineIntroStatus.pptx,

    accessed June 2017. [↑](#footnote-ref-20)
21. Markowitz LE, Dunne EF, Saraiya M, et al. Human papillomavirus vaccination: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2014;63(No. RR-05). [↑](#footnote-ref-21)