

The HPV vaccine 10 years on: where are we now?

Elsevier.com/connect/the-hpv-vaccine-10-years-on

Ten years ago, the first teenage girl was vaccinated against human papillomavirus (HPV), dramatically reducing her risk of cervical cancer. Despite controversy and even protests about the vaccine, its uptake has been relatively successful, with almost 90 percent of girls in England aged 12-13 being vaccinated, according to [statistics cited in a 2013 Vaccine study](#).

However, teenage vaccination in general – and HPV in particular – often has low rates of uptake, particularly in developing countries. This can mean the unnecessary healthcare burden of treating preventable cancers.

Xavier Bosch, MD, MPH, is Editor-in-Chief of *Papillomavirus Research*.

Research has moved on significantly since the first vaccine; second-generation vaccines are now being evaluated for protection against additional strains of the virus and a variety of other HPV-induced cancers. With an increase in research comes an increase in scientific literature: about 3,000 articles are being published on HPV every year.

In response, Elsevier created [Papillomavirus Research](#), an open access journal that publishes research on all aspects of human papillomavirus and other related cancer-causing viruses. To mark the 10-year anniversary of the first HPV vaccine, the journal's Editor-in-Chief, Dr. [Xavier Bosch](#), invites you to read the top-cited articles published in *Papillomavirus Research*, and looks ahead to the future of HPV research



Preventing HPV infection

HPV is the most common sexually transmitted infection, [according to the US Centers for Disease Control and Prevention \(CDC\)](#); almost everyone will have been infected in their adult lives. There are 40 types of genital HPV, many of which cause few or no symptoms. But some types of HPV cause genital warts; about 1 percent of people have visible warts caused by HPV at any given moment.

At least 13 HPV types – and more specifically types 16 and 18 – can also cause cervical cancer in women and a range of less common cancers, including cancers of the anus, penis, vagina, vulva and oropharynx. HPV is responsible for an estimated 600,000 cancer cases worldwide every year. A decade ago, the first HPV vaccines were released in the US in a bid to cut cervical cancer cases: in June 2006, [the FDA approved Gardasil](#) (to protect against HPV 6, 11, 16 and 18), and Cervarix (for HPV16 and 18) was approved soon after that.

The vaccine is the most recent addition to a toolkit of measures to reduce cervical cancer, including conventional cytology-based screening programs and, more recently, the promising options of including HPV tests as a single screening tool or as part of a co-testing scheme. Vaccinating boys can also curb the spread of the virus, ultimately reducing the rate of cervical cancer in particular. But many countries do not benefit from screening programs, and boys are often not targeted. *Papillomavirus Research* Editor-in-Chief Dr. [Xavier Bosch](#), senior consultant to [the Cancer Epidemiology Research Program \(CERP\)](#) of the [Catalan Institute of Oncology \(ICO\)](#) in Barcelona, Spain, explained:

The HPV vaccines are excellent and already have an impressive record of efficacy, effectiveness and safety. Vaccination coverage is, however, only modest at the international level. It has been estimated that some 45 million girls have been vaccinated worldwide in public programs. These programs tend to target a few cohorts of young preadolescent girls with only a few countries running catch up programs and including boys in the vaccination campaigns. This is still a limited use of this preventive resource.

These measures are refined and updated based on the results of new research and clinical trials. In addition to advanced HPV screening tools calibrated to operate under field conditions and a decade of HPV vaccination, in 2015 a second generation vaccine, Gardasil 9 (to protect against HPV genotypes 6, 11, 16, 18, 31, 33, 45, 52 and 58), was licensed and is being introduced in North America and Europe. This vaccine should directly protect against 90 percent of the HPV types that cause cervical cancer.

Although progress in therapeutics is slow, Dr. Bosch said there is much to look forward to:

Experimental therapeutic vaccines are under active development and in clinical trials. Basic research and technology will continue to refine the diagnostic tools to identify early stages of cancer development. HPV vaccines are already excellent in prophylaxis and novel products may incorporate desirable features such as different delivery methods, better stability, efficacy against multiple strains and lower production costs.

Publishing progress in HPV research

With scientific development comes an increase in scholarly articles. But with 3,000 papers a year scattered throughout a plethora of journals that accept articles on HPV, Dr. Bosch explained there was a need for a more specialized publication.

It was increasingly difficult to keep up with the literature on HPV, partly because it was so spread out and difficult to find. We launched *Papillomavirus Research* to provide a platform for research on HPV and related viruses, collaborating closely with the [International Papillomavirus Society](#). It offers the HPV research and clinical communities a place to share their work and maintain a high standard of quality in HPV research.

Papillomavirus Research is an open access journal that is already known in the community for its fast and thorough review process – the key to maintaining the journal’s high quality content. It had a very successful first year, receiving close to 80 manuscripts, 50 of which have been published or are being processed. Dr. Bosch anticipates that by the next [International Papillomavirus Conference](#) in February 2017, *Papillomavirus Research* will have been evaluated and accepted in all major indexing and retrieval systems, including [Scopus](#) and [PubMed](#).



The impact of controversy

By publishing high quality peer-reviewed content with the latest knowledge about HPV, the journal will also play a role in improving public health and engagement on the topic.

When the HPV vaccine was first introduced a decade ago, it was met with resistance and steeped in controversy.

Despite supporting studies, this controversy rages on, impacting people's health worldwide.

HPV vaccines work best when given to preadolescent girls (and boys), before they become sexually active; this is one of the reasons for resistance. Some people claim the vaccine promotes promiscuity by sending the message to young people that there is no danger of getting a sexually transmitted infection. Even though [research shows there is no increase in sexual activity](#) as a result of the vaccine, the “moral” argument is still keeping US vaccination rates relatively low.

According to Dr. Bosch, this is a problem that needs to be taken seriously:

The HPV vaccine is generating some anti-vaccine reactions and vaccine hesitancy in some countries. This deserves attention; the scientific and public health communities need to monitor introduction and reinforce access to vaccination in all countries worldwide. Indications need to be regularly updated in light of the latest clinical trials and the evaluation of public programs. We also need to improve our communication with the public, based on sound evidence published in journals like *Papillomavirus Research*.

Top 5 most cited *Papillomavirus Research* articles

These articles are all published open access:

The Editor-in-Chief

Dr. [Xavier Bosch](#) is senior consultant to [the Cancer Epidemiology Research Program \(CERP\)](#) at the [Catalan Institute of Oncology \(ICO\)](#) in Barcelona, Spain. He also serves as Chief of International Affairs at ICO and is the Executive Director of the ICO/IARC [Information Centre on HPV and Cancer](#). Dr. Bosch is the editor of the international newsletter [HPV Today](#) and is Director of an [e-learning effort in oncology](#), which includes e-courses on cervical cancer prevention. His epidemiological research on cancers linked to infectious agents led him to be involved in demonstrating causality in the HPV and invasive cervical cancer relationship. He currently works on integrating HPV vaccination and screening in environments with limited resources and disseminating scientific information of clinical relevance.

The journal

[Papillomavirus Research \(PVR\)](#), *the Journal of HPV and other Small DNA Tumor Viruses* publishes innovative papers related to all aspects of papillomaviruses and other small DNA tumor viruses. The official journal of the [International Papillomavirus Society](#), PVR is an open access publication that aims to bring together virologists, immunologists, epidemiologists and clinicians working in the booming field of HPV and animal papillomaviruses, polyomaviruses and other small DNA tumor viruses and their associated diseases, in order to foster and facilitate interdisciplinary communication. This journal is published by Elsevier.

Image of papillomavirus © [istock.com/luismmolina](#)