

Cervical cancer vaccine roll-out shows efficacy in reducing cervical cancer and other HPV-related disease

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With the creation of safe and efficacious vaccines to target human papillomavirus in the first decade of this century, WHO has an

ambitious target to lower cervical cancer incidence (mostly caused by HPV) and mortality by 30% by 2030, meaning each country has a target of vaccinating 90% of girls by age 15, 70% of women receiving a high precision screening test at least at age 35 and 45 years of age, and 90% of all women requiring treatment at any age to receive it.

The targets are aspirational and as yet, it appears no country has been verified as reaching them. The aim is for all countries to reach a target of cervical cancer incidence of less than four cases per 100,000 women per year, eliminating it as a public health threat.

However, a presentation by Professor Suzanne Garland (University of Melbourne, Australia) at this year's [ESCMID Global Congress](#) (formerly ECCMID, 27–30 April, Barcelona) reveals that, even though evidence is clear and continues to build that HPV vaccination is reducing cervical cancer incidence and mortality and HPV-related disease (such as genital warts, cervical, vaginal and vulval precancers, and rates of HPV infection leading to other cancers such as head and neck cancers, and anal and penile cancers caused by types of HPV covered by the vaccines) there are high variations in coverage globally including between high-income countries that can easily afford the vaccines; while many low- and [middle-income countries](#) are yet to include this vital tool in their national vaccination programs.

Professor Garland emphasizes that while high coverage of HPV vaccination especially in girls (and also boys) before they become infected is the number one tool we have to fight cervical cancers and HPV related disease, we cannot take our eyes off other prevention measures, such as condom use during sexual intercourse, age appropriate sex education, male circumcision and tobacco control strategies. Also screening for cervical disease and treatment thereof to prevent cancer occurring.

She reviewed WHO Dashboard data showing that, of 194 reporting countries, 137 (71%) have HPV in their national vaccination programs, while a further four (2%) have partially introduced them and 57 (27%) have not. Of the 141 with total /partial HPV national programs reporting to the end of 2023, 59 (42%) are for both sexes, while 82 (58%) are for girls only.

Average full vaccine coverage is 44% globally, highest in WHO's European region at 60% and lowest in the Americas Region at 31% (in Africa countries with a program average coverage is 38%). Globally including all 194 countries, 21% of girls have received at least one dose of HPV vaccine by age 15, which has steadily increased from 4% in 2010 with a short drop in the COVID years.

Among high-income countries there is wide variation according to WHO's database. Prof Garland refers to Australia's own national figures which have remained strong and world leading—single dose HPV vaccination coverage among males at 15 years of age in Australia in 2021 and 2022 was 84.4% and 83.1%, respectively.

Coverage in females at 15 years of age is even higher in 2021 and 2022 was 86.2% and 85.3%, respectively. This has seen a 92% reduction in the prevalence of HPV types included in the vaccine, and Australia aims to be the first country to eliminate cervical cancer as a public health threat.

The latest prevalence figure for Australia dates to 2019, as they await further data to update to 2023. Since the Australia's 2019 cervical cancer incidence is 6.4 new cases per 100,000 women in 2019, Prof Garland hopes the next update whenever it comes will show Australia has surpassed the target and dropped below four.

The WHO database also shows Canada, Ireland, Sweden, Spain and

Portugal all with full vaccination coverage above 70%, the U.S. and Germany trailing behind on 50–70%, and Italy and France among the lowest at 30–50%. Japan is in the worst situation of any high-income country, with Professor Garland saying this was due negative media coverage and the government being slow to endorse vaccination safety.

Latest figures from the UK Health Security Agency show that HPV vaccine coverage of dose one for year 8 females in 2022 to 2023 (born 1 September 2009 to 31 August 2010) was 71.3% in England, and the equivalent figure for boys is 65.2%.

Denmark suffered a huge dip in coverage in 2016 with negative mass media crippling coverage which then recovered with various campaigns, while Sweden and Canada have consistently improved vaccine coverage. France has long experienced various issues persuading its population to use vaccines; yet while HPV vaccine coverage is low it is steadily improving.

Prof Garland discusses evidence from various sources including a 2019 analysis in *The Lancet* of 65 studies from 19 [high-income countries](#) showing how HPV infections, anogenital warts and precancerous cervical lesions all fell substantially following introduction of HPV vaccine. She also discusses an *NEJM* article showing how in unvaccinated women cervical cancer rates remain 94 per 100,000 women, dropping to 17 per 100,000 in women vaccinated aged 17–29 years and four per 100,000 in women vaccinated when aged under 17 years.

Four per 100,000 is the target WHO wants all countries to reach. This evidence shows that it is best to vaccinate before a person's first sexual intercourse because vaccines prevent infection and thus subsequent disease but are not therapeutic, meaning they won't treat an already established infection.

She also presents evidence from Australia on how the protective effects of vaccination extended to men even before boys were included in the vaccination program—that is, vaccinating girls also helped protect men from HPV disease (herd immunity), as reduces circulating virus in the community and this was further increased when boys were included. However young men who had sex with men only began to benefit once boys themselves were vaccinated.

She also discusses global efforts to boost HPV coverage using a single dose, adopted by 51 countries by March 2024, based on SAGE recommendations from observational and also new RCT data published in *NEJM* showing one dose effective in those aged 15–20 years, although two doses are still recommended six months apart for those 20 years and over.

The challenges that remain for countries to improve coverage are competing vaccines, their price and delivery, political will and the number of doses required, as well as the interruptions from global events such as wars and the COVID-19 pandemic. But even LMIC can overcome these challenges, with Malaysia being one such country with very high coverage.

But Prof Garland concludes, "Vaccination is a critical component of the global strategy to eliminate cervical cancer as a public health problem. HPV vaccines are highly effective at preventing HPV infections, and HPV related diseases, including associated cancers and [genital warts](#), in females and males.

"There is strong and growing evidence on effectiveness against cervical [cancer](#), with rates falling steadily as vaccination takes effect, and Australia has demonstrated what is possible with rapid and widespread HPV vaccine coverage. Scaling up vaccine access and coverage globally is critical to reduce inequities between and within countries."

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