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Potential for global elimination of cervical cancer: modelled projections of the impact of scaled-up HPV vaccination and cervical screening in 181 countries from 2020 to 2099

Background:

Cervical screening and human papillomavirus (HPV) vaccination have been implemented in most high-income countries; however, coverage is very limited in low- and middle-income countries (LMICs). In a new article, published today in *The Lancet Oncology*, IARC researchers and their partners quantify the cumulative potential impact of scaled-up global HPV vaccination and cervical screening coverage on cervical cancer cases averted over the 50 years from 2020 to 2069.

Goals:

The study aimed to: (i) quantify the cumulative potential impact of scaled-up global HPV vaccination and cervical screening coverage on cervical cancer cases averted over the 50 years from 2020 to 2069, and (ii) predict outcomes beyond 2070 in order to identify the earliest years by which cervical cancer rates could drop below two absolute levels, which could be considered as elimination thresholds: the rare cancer threshold (< 6 per 100 000), which is currently observed in only a few countries, and a lower level of < 4 per 100 000.

Results:

In the absence of further intervention, over the period 2020–2069, 44.4 million cervical cancer cases would be diagnosed, and almost two thirds of those would occur in countries with low or medium Human Development Index (HDI). Rapid scale-up of HPV vaccination to 80–100% coverage globally by 2020 with a broad-spectrum HPV vaccine could avert 6.7–7.7 million cases during the period 2020–2069, but more than half of those would be averted after 2060.

Implementing twice-in-a-lifetime HPV-based screening in all LMICs with 70% coverage globally will bring forward the effects of prevention and avert an additional 5.7–5.8 million cases in the next 50 years.

Rapid scale-up of combined high-coverage cervical screening and HPV vaccination from 2020 onwards will result in a decline in average cervical cancer rates in countries with very high, high, medium, and low HDI to < 6 per 100 000 by 2045–2049, 2055–2059, 2065–2069, and 2085–2089, respectively, and to < 4 per 100 000 by 2055–2059, 2065–2069, 2070–2079, and 2090–2100+, respectively, although rates of < 4 per 100 000 would not be achieved in all individual countries with low HDI by the end of the century. If delivery of high-coverage prevention is more gradually scaled-up over the period 2020–2050 (20–30% vaccination coverage and 25–40% screening coverage by 2030, increasing to 40–60% vaccination coverage and 90% screening coverage by 2050), then by the end of the century average cervical cancer rates will decline to 0.8, 1.3, 4.4, and 14 per 100 000 in countries with very high, high, medium, and low HDI, respectively.

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Methods:

The study authors performed a statistical analysis of existing trends in cervical cancer, combined with a dynamic multi-cohort modelled analysis of HPV vaccination and cervical screening using the Policy1-Cervix model platform, to predict the burden of cervical cancer given various potential future prevention scenarios. The results are presented globally, by HDI category, and at the individual country level.

Quotes from authors:

Dr Elisabete Weiderpass (IARC Director): “The results of this study play an important role in quantifying the cumulative potential impact of scaled-up global HPV vaccination and cervical screening coverage on cervical cancer cases averted over the 50 years from 2020 to 2069. They provide key insights into the rollout of the World Health Organization Global Cervical Cancer Elimination Initiative.”

Dr Karen Canfell (Lead Investigator, Cancer Council NSW): “It’s incredibly exciting for women all over the world. However, we are only in the early stages of the push towards elimination, as implementation efforts towards achieving global scale-up of vaccination and screening have just begun.”

Dr Freddie Bray (Head of Section of Cancer Surveillance, IARC): “These projections measure the potential impact of scaled-up HPV vaccination and cervical screening in drastically reducing cervical cancer incidence rates. There is also a need to scale up population-based cancer registries in LMICs, to be able to monitor and evaluate the true impact of these interventions, both nationally and globally.”

Partners:

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