

HPV Vaccine Programs Are Failing to Reach Young Female Populations of Low-Income Countries

Publicly funded HPV immunization programs around the world have successfully vaccinated many young women overall, but a large share of those with the highest risk of HPV-related disease have been left out, according to a global estimate of HPV vaccination coverage.¹ By the end of 2014, some 47 million women had received a full course of HPV vaccine through these programs, which corresponds to coverage of about 1% of all females and 6% of females aged 10–20 worldwide. Coverage among those aged 10–20, however, was 10 times higher in more developed regions than in less developed ones (34% vs. 3%). In addition, cancer projections suggest that even though fewer than half as many women in upper-middle-income countries as in high-income countries have been vaccinated (13 million vs. 32 million), the impact of those vaccinations will be greater in upper-middle-income countries than in high-income countries (178,192 vs. 165,033 averted cervical cancer cases by age 75).

Investigators performed a systematic review of the literature and official websites at the end of 2014 to identify HPV immunization programs in operation worldwide. They assessed the characteristics of each program (e.g., year of introduction, target ages and vaccination schedule) and retrieved age-specific HPV vaccination coverage rates. The investigators converted the coverage rates into birth cohort-specific rates and applied those to global population estimates and to projections of cervical cancer cases and deaths by age 75. Estimates were generated for individual countries and for countries grouped by income level and by development status, with stratification by age-group. Analyses assumed the vaccine was 70% effective in preventing HPV infections (i.e., 100% efficacy against HPV types 16 and 18, which are the cause of 70% of cervical cancer cases worldwide).

Between June 2006 and October 2014, a total of 64 countries implemented a national HPV vaccination program, and four countries implemented subnational programs; in addition, 12 overseas territories launched such

programs. For the majority of vaccine programs, the target age-group was 12-year-olds (72%) and the vaccine was delivered through schools (68%). Collectively, the programs targeted an estimated 118 million females aged 9–45 for either primary or catch-up HPV vaccination between 2006 and 2014. This number represents about 4% of all females globally, 9% of those aged 15–26 and 12% of those aged 10–14; however, merely 18% of the targeted women in the population were from less developed regions.

In total, 47 million women had received the full three-dose course of the vaccine by the end of 2014, which translates to coverage of about 1% of all females worldwide, 6% of those aged 10–20 and 40% of those who had been targeted for vaccination through the programs. Overall, 59 million women had received at least one dose of the vaccine, which translates to coverage of roughly 2% of all females, 8% of those aged 10–20 and 50% of those targeted.

Nearly all women who were fully vaccinated were from high-income countries (68%) or upper-middle-income countries (28%), the latter primarily in Latin America; just 3%—or roughly one million women—were from low-income and lower-middle-income countries. In addition, the proportion of female youth aged 10–20 globally who received the full course of the vaccine in more developed regions was sharply higher than that in less developed regions (34% vs. 3%). Among 10–29-year-olds, age-specific rates of full-course vaccine coverage were higher in Northern Europe and in Australia and New Zealand than in other world regions; the highest rate in both regions (69%) was seen among women aged 15–19 years. By contrast, in Central America, South America and southern Africa, coverage occurred predominantly among 10–14-year-olds (18–40%). When all age-groups were combined, Oceania had the highest coverage (17% in Australia and New Zealand, and 10% in Micronesia).

Cancer projections suggest that among the 47 million women fully vaccinated worldwide, 379,000 cases of cervical cancer and

156,000 deaths from the disease would be averted by age 75. Although fewer than half as many women have been vaccinated in upper-middle-income countries as in high-income countries (13 million vs. 32 million), the number of cervical cancer cases averted in upper-middle-income countries is expected to be 8% greater (178,192 vs. 165,033 cases).

The study's findings show progress in HPV vaccination of the female population globally, according to the authors; however, they also reveal virtually nonexistent access to the vaccine in poorer countries, mainly in Africa and Asia, where most of the world's population lives and where there are highly vulnerable populations at high risk of developing cervical cancer and other HPV-related diseases. The authors note that vaccine affordability and introduction strategies warrant attention in these settings, and that allowance of a reduced-dose course "could be a crucial issue." The authors acknowledge that study limitations, including missing data and the use of birth cohorts to estimate coverage. They conclude that "rapid roll-out of the vaccine in low-income and middle-income countries might be the only feasible way to narrow present inequalities in cervical cancer burden and prevention."—S. London

REFERENCE

1. Bruni L et al., Global estimates of human papillomavirus vaccination coverage by region and income level: a pooled analysis, *Lancet Global Health*, 2016, 4(7):e453–e463.