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Cervical Cancer and Grade 3 Cervical Intraepithelial Neoplasia Incidence Reduced in Young, HPV-Vaccinated Individuals

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Those immunized between the ages of 12 and 13 in England experienced a significant estimated reduction in cervical cancer and grade 3 cervical intraepithelial neoplasia incidence rates compared with unvaccinated women. After introducing a human papillomavirus (HPV) immunization program, a significant reduction in cervical cancer and the incidence of grade 3 cervical intraepithelial neoplasia (CIN3) in young individuals was observed in England, according to results of a register-based observational study published in *The Lancet*.¹

Compared with women who were unvaccinated, those who received bivalent vaccine (Cervarix) at the age of 12 to 13 years experienced an estimated relative reduction in cervical cancer rates of 87% (95% CI, 72%-94%). Risk reductions for CIN3 were 39% (95% CI, 36%-41%), 75% (95% CI, 72%-77%), and 97% (95% CI, 96%-98%) for those who were offered the vaccine at ages 16 to 18 years, ages 14 to 16 years, and ages 12 to 13 years, respectively.

“The magnitude of the reduction reported for individuals offered the vaccine in school year 8 was much greater than would be expected under that scenario and also than would be expected assuming a single dose provides 100% protection against HPV 16 and 18,” the investigators wrote.

The research team utilized 3 vaccinated cohorts accounting for the school year when women were offered the vaccine. Those cohorts included ages 12 to 13 (school year 8), ages 14 to 16 (school years 10 to 11), or ages 16 to 18 (school years 12 to 13). For each cohort, the expected reduction in cervical cancer incidence rates was 36% to 48%,

59% to 64%, and 68% to 71% in the 16 to 18 years, 14 to 16 years, and 12 to 13 years cohorts, respectively.

Cervical cancer and CIN3 incidences diagnosed among women between the ages of 20 and 64 years in England between January 1, 2006 to December 2017, January 2018 to September 2018, October 2018 to March 2019, and April 2019 to June 30, 2019, were extracted on January 26, 2021. The investigators used data from the National Cancer Registration and Analysis Service, Public Health England (PHE).

The research team also defined 7 birth cohorts, which correspond with differences in age when first invited for screening and the school year when vaccination was offered. Those cohorts included patients who were invited from age 20.0 years with no vaccine (cohort 1), invited from age 20.0 years or 25.0 years with no vaccine (cohort 2), invited from age 25.0 years with no vaccine (cohort 3), invited from age 24.5 years with no vaccine (cohort 4), invited from age 24.5 years and offered vaccination in school years 12 to 13 (cohort 5), invited from age 24.5 years and offered vaccination in school years 10 to 11 (cohort 6), and not invited before age 24.5 years and offered vaccination in school year 8 (cohort 7).

A total of 27,946 diagnoses of cervical cancer and 318,058 cases of CIN3 observed during the study period. The estimated relative risk of cervical cancer for the patient population was 34% (95% CI, 25%-41%) lower for cohort 5, and 62% (95% CI, 52%-71%) for cohort 6, and 87% (95% CI, 72%-94%) lower for cohort 7.

By June 30, 2019, the research team estimated that 448 fewer than expected cases of cervical cancer (95% CI, 339-556) and 17,235 (95% CI, 15,919-18,552) fewer cases of CIN3 took place among the vaccinated cohorts in England.

Of note, the study was limited due to the lack of individual-level data regarding vaccination status, limiting the research team's ability to estimate individual-level efficacy. Furthermore, no information is available on the HPV type in each of the cancers.

"We hope that these new results encourage uptake as the success of the vaccination programme relies not only on the efficacy of the vaccine but also the proportion of the

population vaccinated,” co-author Kate Soldan of the UK Health Security Agency, concluded.²

References

Falcaro M, Castañon A, Ndlela B, et al. The effects of the national HPV vaccination programme in England, UK, on cervical cancer and grade 3 cervical intraepithelial neoplasia incidence: a register-based observational study. *Lancet*. Published online November 3, 2021. doi:10.1016/S0140-6736(21)02178-4 Older HPV vaccine cuts cervical cancer rate up to 87%, study finds. News release. Reuters. November 3, 2021. Accessed November 4, 2021. <https://tinyurl.com/4xwkrssx>