

## Human Papillomavirus–Associated Cancers — United States, 2008–2012

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Human papillomavirus (HPV) is a known cause of cervical cancers, as well as some vulvar, vaginal, penile, oropharyngeal, anal, and rectal cancers (1,2). Although most HPV infections are asymptomatic and clear spontaneously, persistent infections with one of 13 oncogenic HPV types can progress to precancer or cancer. To assess the incidence of HPV-associated cancers, CDC analyzed 2008–2012 high-quality data from the CDC's National Program of Cancer Registries and the National Cancer Institute's Surveillance, Epidemiology, and End Results program. During 2008–2012, an average of 38,793 HPV-associated cancers were diagnosed annually, including 23,000 (59%) among females and 15,793 (41%) among males. By multiplying these counts by the percentages attributable to HPV (3), CDC estimated that approximately 30,700 new cancers were attributable to HPV, including 19,200 among females and 11,600 among males. Cervical precancers can be detected through screening, and treatment can prevent progression to cancer; HPV vaccination can prevent infection with HPV types that cause cancer at cervical and other sites (3). Vaccines are available for HPV types 16 and 18, which cause 63% of all HPV-associated cancers in the United States, and for HPV types 31, 33, 45, 52, and 58, which cause an additional 10% (3). Among the oncogenic HPV types, HPV 16 is the most likely to both persist and to progress to cancer (3). The impact of these primary and secondary prevention interventions can be monitored using surveillance data from population-based cancer registries.

CDC analyzed data from population-based cancer registries that participate in the CDC's National Program of Cancer Registries and the National Cancer Institute's Surveillance, Epidemiology, and End Results program and met the criteria for high data quality

for all years 2008–2012, covering approximately 99% of the U.S. population.\* Cases were classified by anatomic site using the *International Classification of Diseases for Oncology, 3rd Edition*<sup>†</sup> and were confirmed histologically. HPV-associated cancers were defined as invasive cancers at anatomic sites (i.e., cervix, vulva, vagina, penis, oropharynx, anus, and rectum) with cell types in which HPV DNA frequently is found (all carcinomas of the cervix, including adenocarcinomas and squamous cell cancers [SCC]; SCCs only for the other anatomic sites). Oropharyngeal cancers included cancers of the base of tongue; pharyngeal tonsils, anterior and posterior tonsillar pillars, and glossotonsillar sulci; anterior surface of soft palate and uvula; and lateral and posterior pharyngeal walls.<sup>§</sup> Age-adjusted incidence rates were calculated per 100,000 persons and standardized to the 2000 U.S. standard population. Rates were considered significantly different from the referent category at a p-value of <0.05.

\*<http://www.cdc.gov/uscs>.

† <http://codes.iarc.fr/>.

§ American Joint Committee on Cancer (AJCC). AJCC Cancer Staging Manual.

7th ed. Chicago, IL: Springer; 2010.

### Highlights From Article...

#1 HPV-Associated Cancer: Cervical Cancer in Women  
11,771 annually—91% attributable to HPV

#2 HPV-Associated Cancer: Oropharynx Cancer in Men  
12,638 annually—72% attributable to HPV

### Continuing Education article:

<http://www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6526.pdf>



U.S. Department of Health and Human Services  
Center for Disease Control and Prevention