

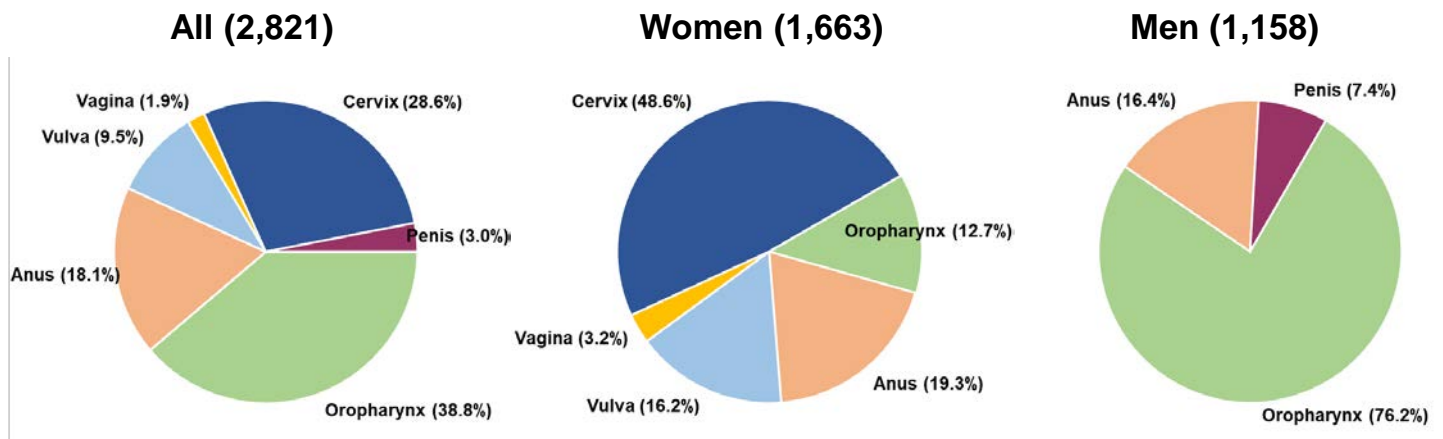
# HPV-Related Cancer Incidence and HPV Vaccination Rates in New York State, 2015-2019

## Cancers associated with human papillomavirus (HPV)

- Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States.
- Two high-risk HPV types, types 16 and 18, account for most HPV-related cancers.<sup>1</sup>
- HPV infection is thought to cause almost all cervical cancers, over 90% of anal cancers, 70% of oropharyngeal cancers, 75% of vaginal cancers, 70% of vulvar cancers, and over 60% of penile cancers.<sup>1</sup>
- To protect against cancers caused by HPV, CDC recommends two doses of HPV vaccine for boys and girls who receive their first dose before age 15, and three doses for older teens and young adults who start the vaccine series at ages 15 through 26 and for immunocompromised persons.<sup>2,3</sup>
- In this report, HPV-related cancers were categorized using the same definition that CDC used to generate the 2001-2019 U.S. Cancer Statistics.<sup>4,5</sup>

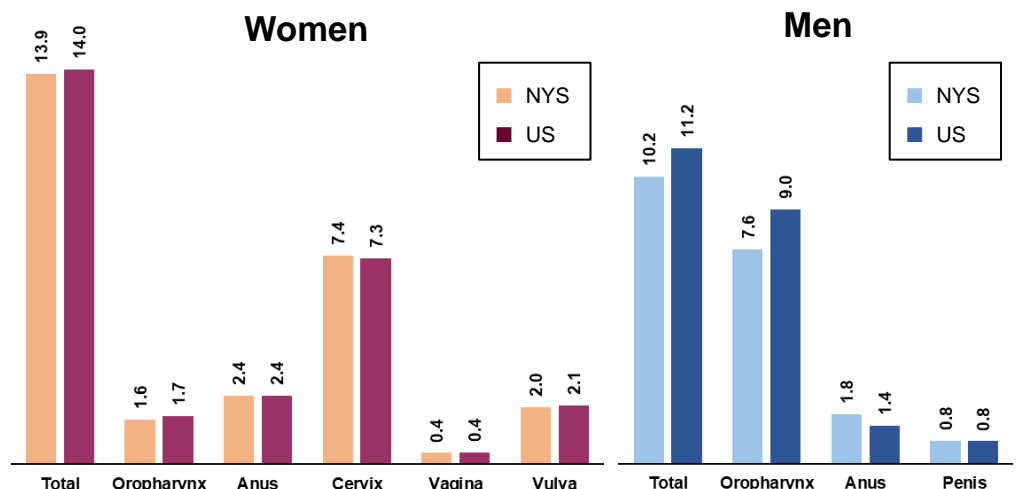
## Number of cancer cases\*

- An average of 2,821 New York State (NYS) residents were diagnosed with an HPV-related cancer each year between 2015 and 2019, with about 59% of cases in women and 41% in men.
- Cervical cancer was the most common HPV-related cancer among women, and oropharyngeal cancer was the most common among men.



## Cancer incidence† (per 100,000 persons) by sex, New York State\* vs. United States§

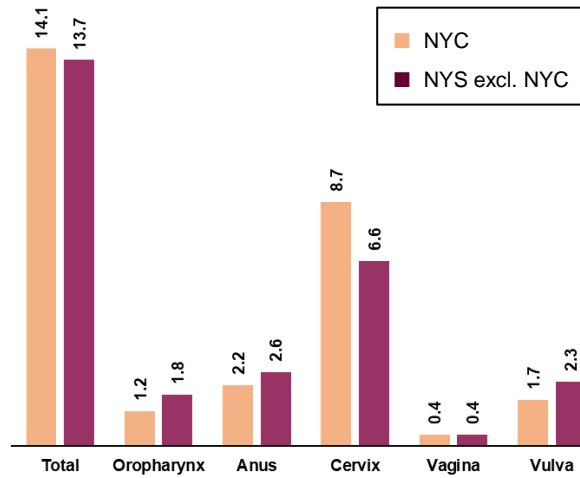
- Among women, rates of HPV-related cancers in NYS were similar to those for the US.
- For men, rates of anal cancer were 30% higher in NYS than in the US and oropharyngeal cancer rates were 17% lower in NYS than in the US. For all HPV-related sites combined and for penile cancer, rates were within 10%.



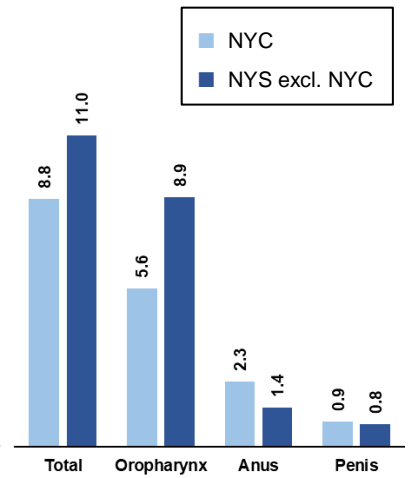
# Cancer incidence† (per 100,000 persons) by sex and geography\*

- For all HPV-related cancers combined, New York City (NYC) had comparable incidence with NYS excluding NYC among women, but lower incidence among men.
- Compared to the rest of the state, NYC had statistically significantly higher incidence rates of cervical and male anal cancer, but lower rates of vulvar, female anal, and oropharyngeal cancer in both men and women.

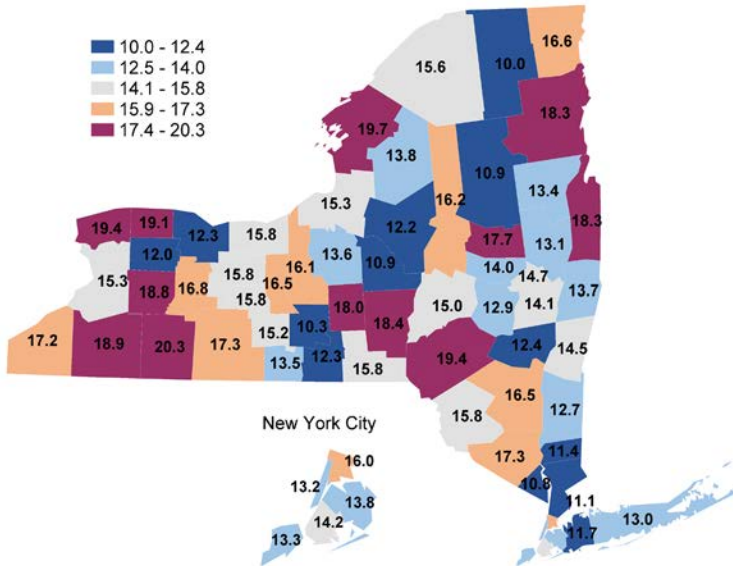
### Women, by Region



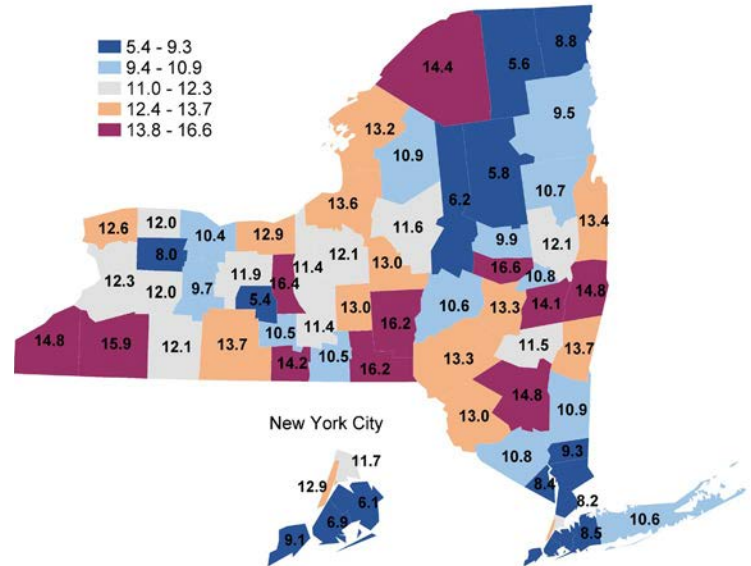
### Men, by Region



### Women, Incidence Rate by County

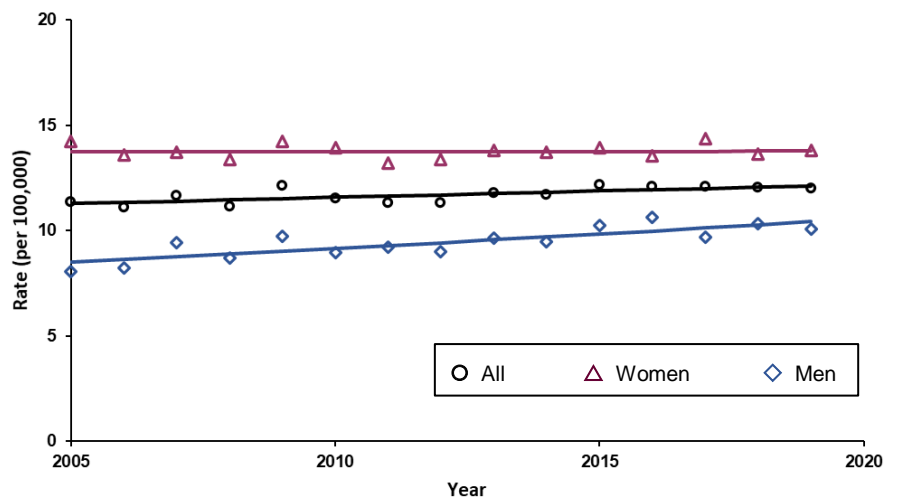


### Men, Incidence Rate by County



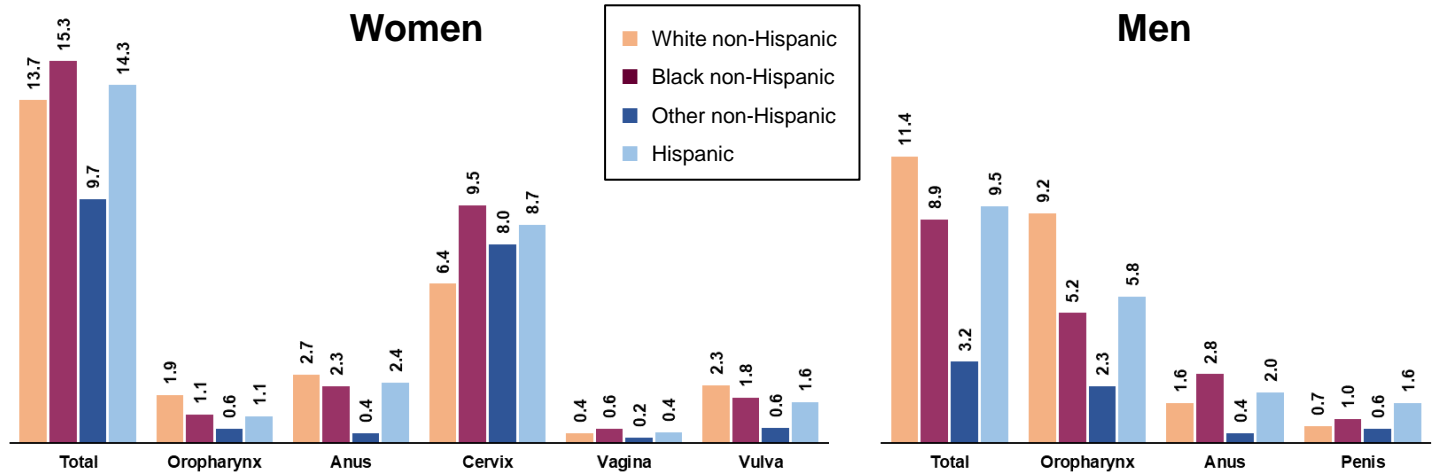
# Trends‡ in cancer incidence† (per 100,000 persons) by sex, 2005-2019\*

- For both sexes combined, the overall HPV-related cancer incidence rate has been increasing with a statistically significant annual percentage change (APC) of 0.5 from 2005 through 2019.
- The incidence rate among men has been increasing with a statistically significant APC of 1.5.
- The incidence rate among women remained stable at 13.8 per 100,000 over the same period.



## Cancer incidence<sup>†</sup> (per 100,000 persons) by sex and race/ethnicity<sup>\*,\*\*</sup>

- Among women in NYS, Black non-Hispanics had the highest rate of all HPV-related cancers combined, primarily because of their higher rates of cervical cancer.
- Among men, White non-Hispanics had the highest rate of oropharyngeal cancer and as a result had the highest incidence of all HPV-related cancers combined.
- For both sexes, incidence rates for all HPV-related cancers except cervical cancer, were lowest among non-Hispanic individuals of Other race.



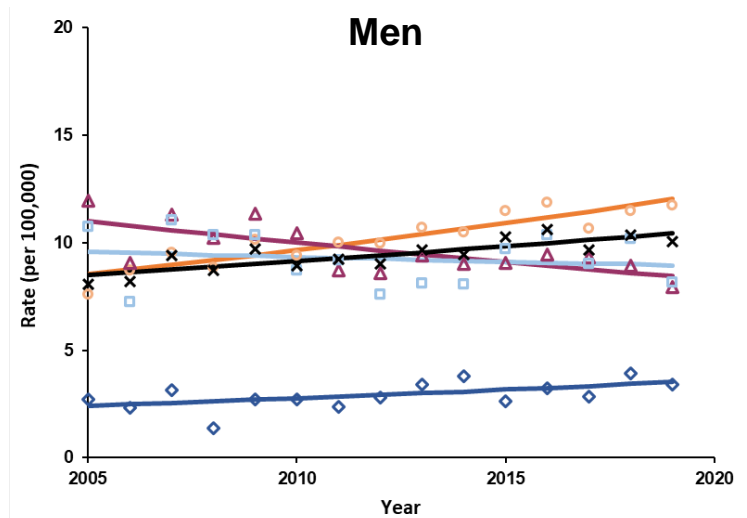
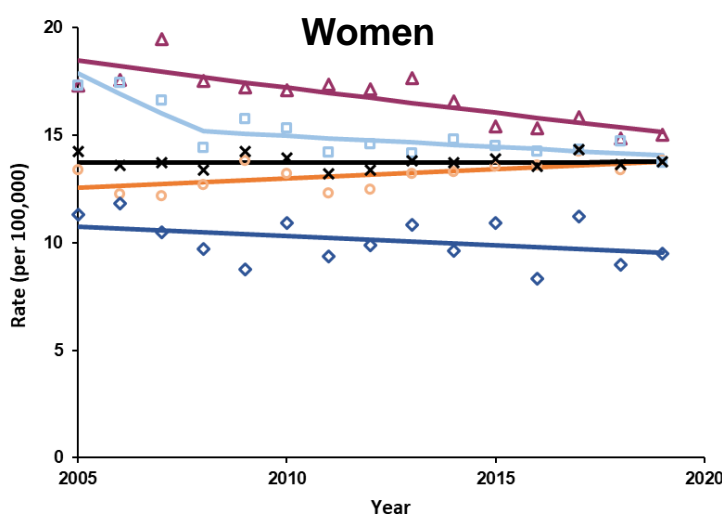
## Trends<sup>†</sup> in cancer incidence<sup>†</sup> (per 100,000 persons) by sex and race/ethnicity<sup>\*, 2005-2019</sup>\*

- For all HPV-related cancers combined, incidence rates among White non-Hispanic women and men have been rising steadily from 2005 through 2019 with a statistically significant AAPC of 0.6 and 2.5, respectively.
- The incidence rate among Other non-Hispanic men has also increased significantly by 2.7% per year on average.
- Incidence rates for Black non-Hispanic women and men, as well as for Hispanic women, have decreased significantly while rates for Other non-Hispanic women and Hispanic men did not demonstrate statistically significant trends.

### Average Annual Percentage Change (AAPC)

Race/Ethnicity	Women	Men
White non-Hispanic	0.6 <sup>^</sup>	2.5 <sup>^</sup>
Black non-Hispanic	-1.4 <sup>^</sup>	-1.9 <sup>^</sup>
Other non-Hispanic	-0.8	2.7 <sup>^</sup>
Hispanic	-1.7 <sup>^</sup>	-0.5

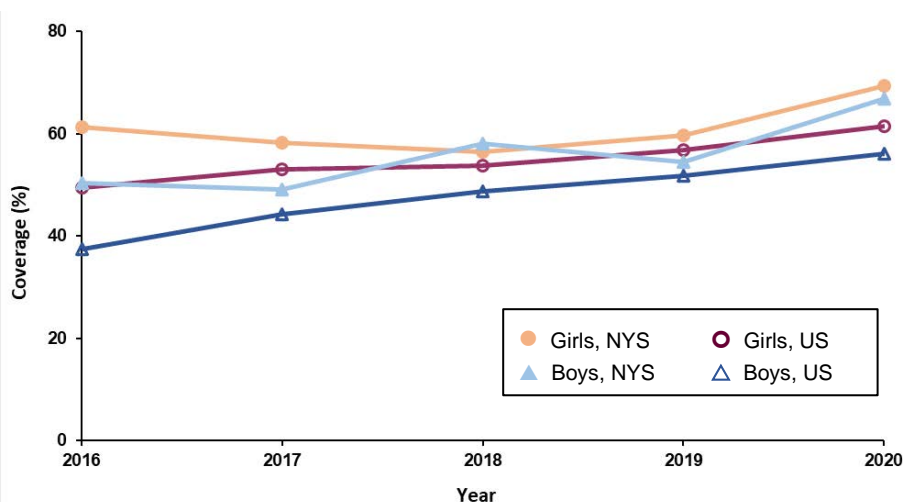
<sup>^</sup> indicates that the AAPC is significantly different from zero at  $\alpha=0.05$  level.



○ White non-Hispanic    △ Black non-Hispanic    ◇ Other non-Hispanic    □ Hispanic

## Up-to-date<sup>††</sup> HPV vaccination coverage among adolescents ages 13-17 by sex, New York State vs. United States<sup>§§</sup>

- In NYS, the percentage of girls and boys who were up to date with HPV vaccination increased from 61.3% and 50.3% in 2016 to 69.4% and 66.8% in 2020, respectively.
- Vaccination coverage in NYS has been higher than nationally for both sexes.
- The HPV vaccination gap between girls and boys decreased between 2016 and 2020 in NYS (from 11.0 to 2.6 percentage points) as well as nationally (from 12.0 to 5.4).



## HPV vaccination promotion

The New York State Department of Health works closely with the [NYS Cancer Consortium's HPV Coalition](#), local health departments and [Cancer Prevention in Action](#) partners to increase HPV vaccination rates and reduce the burden of HPV-related cancers and diseases.

## Footnotes

- \* Source of data: New York State Cancer Registry. Data provisional, November 2021. <https://www.health.ny.gov/statistics/cancer/registry/>
- <sup>†</sup> Rates are per 100,000 persons, age-adjusted to the 2000 U.S. standard population.
- <sup>§</sup> Data are from population-based registries that participate in the National Program of Cancer Registries (NPCR) and/or the Surveillance, Epidemiology, and End Results (SEER) program and meet high-quality data criteria. These registries cover approximately 99% of the U.S. population. <https://www.cdc.gov/cancer/uscs/public-use/index.htm>
- <sup>¶</sup> Trend analysis was conducted using the Joinpoint Regression Program, Version 4.9.0.0, March 2001; Statistical Research and Application Branch, National Cancer Institute. <https://surveillance.cancer.gov/joinpoint>
- \*\* Other race refers to Asian, Pacific islander, and American Indian/Alaskan Native.
- <sup>††</sup> Adolescents are considered to be up to date with HPV vaccination if they have received  $\geq 3$  doses, or they have received 2 doses when the first dose was initiated before their 15<sup>th</sup> birthday and the interval between the two doses is at least at least 5 months minus 4 days. <https://www.cdc.gov/vaccines/programs/iis/cdsi.html>
- <sup>§§</sup> Teen vaccination coverage data are collected through the National Immunization Survey-Teen (NIS-Teen). <https://www.cdc.gov/vaccines/imz-managers/nis/about.html>

## References

1. National Cancer Institute (NCI). 2022. HPV and Cancer. Accessed on April 29<sup>th</sup>, 2022. <https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer>
2. Meites E, Kempe A, and Markowitz LE. Use of a 2-Dose Schedule for Human Papillomavirus Vaccination — Updated Recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep* 2016; 65(49): 1405–1408.
3. Centers for Disease Control and Prevention (CDC). 2022. HPV Vaccination Recommendations. Accessed on April 29<sup>th</sup>, 2022. <https://www.cdc.gov/vaccines/vpd/hpv/hcp/recommendations.html>
4. Centers for Disease Control and Prevention (CDC). 2022. Definitions of Risk Factor-Associated Cancers. Accessed on June 28<sup>th</sup>, 2022. <https://www.cdc.gov/cancer/uscs/public-use/predefined-seer-stat-variables.htm>
5. Centers for Disease Control and Prevention (CDC). 2022. United States Cancer Statistics (USCS). Accessed on June 28<sup>th</sup>, 2022. <https://www.cdc.gov/cancer/uscs/>