

# **Beyond Cervical Cancer: Using Cancer Registry Data to Make the HPV Vaccination Case for Oropharyngeal (and Other) Cancers**

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Division of Cancer Prevention and Control

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# Outline

- Overview of CDC's Division of Cancer Prevention and Control HPV-related priorities
- Trends in HPV-associated cancers
- Resources and opportunities for on-the-ground efforts to support HPV vaccination uptake

# All People Free of Cancer

## Aspirations

Elimination of preventable cancers

All people get the right care at the right time for the best outcome

Cancer survivors live longer, healthier lives

## Strategic Priorities

Reduce the incidence of preventable cancers by reducing modifiable risk factors and promoting healthy behaviors (...by increasing HPV-vaccination)



Scale our best practices to increase impact of screening continuum



Improve health outcomes for cancer survivors



## Our Guiding Principles

Address Health Disparities

Define Expected Outcomes Upfront

Collaborate

Communicate: Tailor to a Specific Audience

## Our Key Strengths

Data

Translation & Evaluation

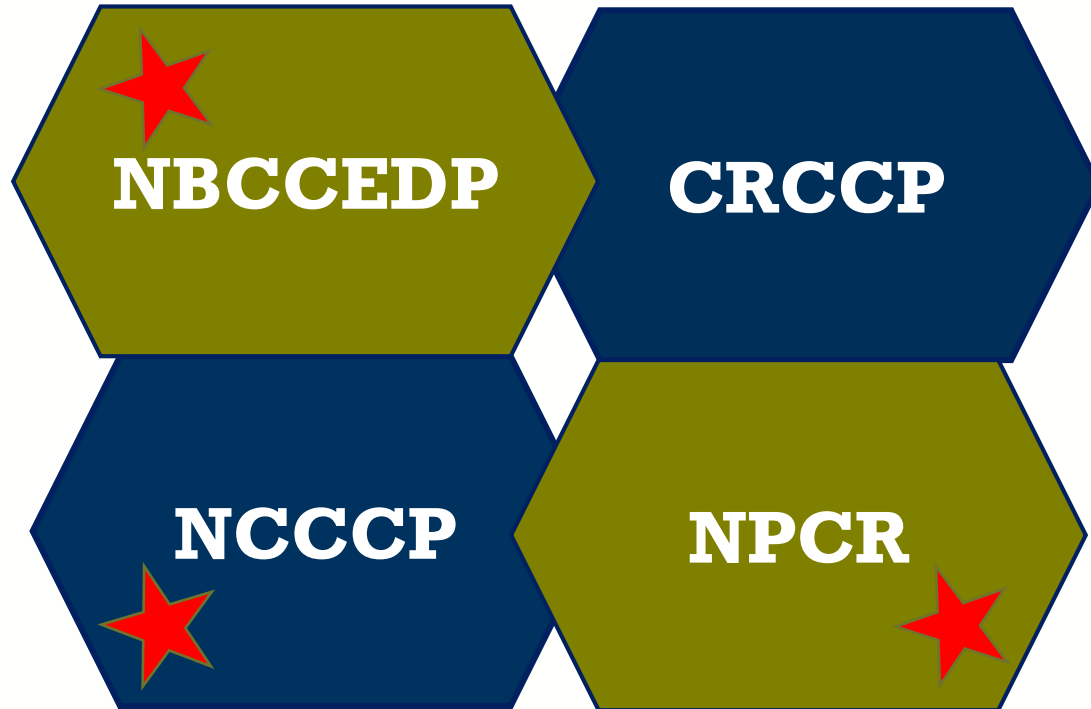
Partnership

**Goal and Aspirations**  
Our longer term **strategic framework.**

**Strategic Priorities**  
Objectives are identified based on need and our **potential to impact** that change over time as desired outcomes are achieved.

**Key Strengths**  
We demonstrate our key strengths by combining **flawless execution** of the familiar and a constant focus on innovation.

# Coordination and Collaboration Across Cancer Programs



National Breast and Cervical Cancer Early Detection Program (**NBCCEDP**)

Colorectal Cancer Control Program (**CRCCP**)

National Comprehensive Cancer Control Program (**NCCCP**)

National Program of Cancer Registries (**NPCR**)

# Trends in HPV-associated Cancers



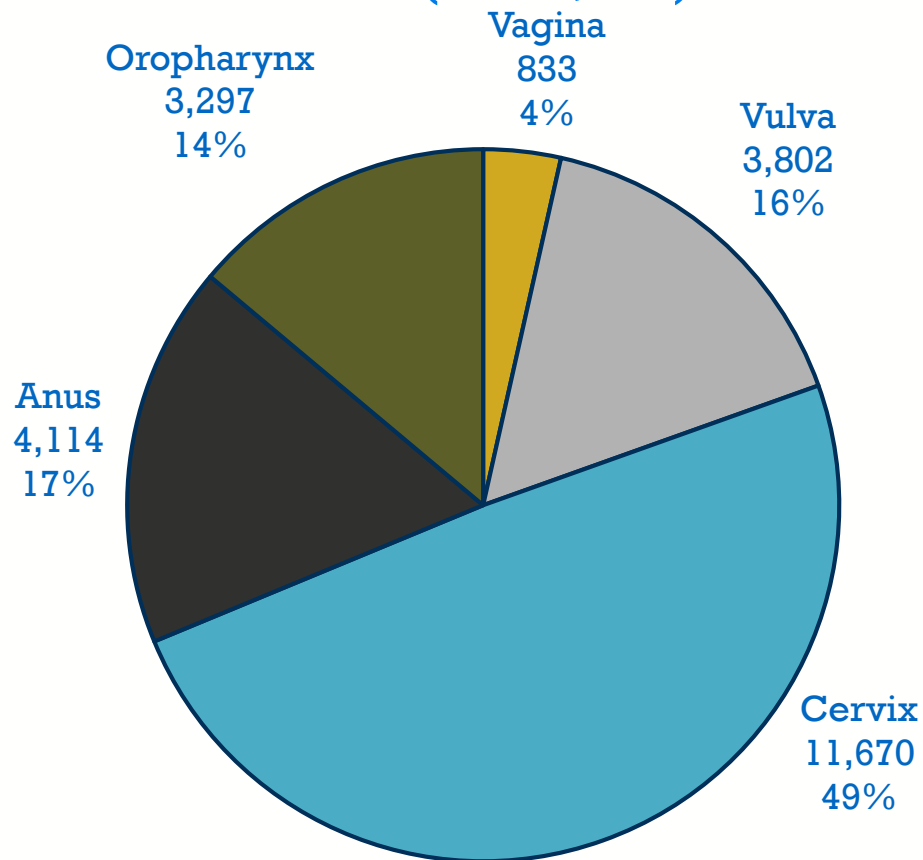
# Number of HPV-Associated Cancer Cases Probably Caused by HPV per Year in the United States, 2010–2014

Cancer site	Average number of cancers per year in sites where HPV is often found (HPV-associated cancers)	Percentage probably caused by any HPV type	Number probably caused by any HPV type	Percentage	Number probably	Percentage	Number probably
				probably caused by HPV types 16/18	caused by HPV types 16/18	probably caused by HPV types 31/33/45/52/58	caused by HPV types 31/33/45/52/58
Cervix	11,670	91%	10,600	66%	7,700	15%	1,700
Vagina	833	75%	600	55%	500	18%	100
Vulva	3,802	69%	2,600	49%	1,800	14%	500
Penis	1,240	63%	800	48%	600	9%	100
Anus	6,220		5,700		5,000		500
Female	4,114	93%	3,800	80%	3,300	11%	400
Male	2,106	89%	1,900	79%	1,700	4%	100
Oropharynx	17,273		12,200		10,600		900
Female	3,297	63%	2,100	51%	1,700	10%	300
Male	13,976	72%	10,100	63%	8,900	4%	600
<b>TOTAL</b>	<b>41,038</b>	<b>79%</b>	<b>32,500</b>	<b>64%</b>	<b>26,200</b>	<b>9%</b>	<b>3,800</b>
<b>Female</b>	<b>23,716</b>	<b>83%</b>	<b>19,700</b>	<b>63%</b>	<b>15,000</b>	<b>13%</b>	<b>3,000</b>
<b>Male</b>	<b>17,322</b>	<b>74%</b>	<b>12,800</b>	<b>65%</b>	<b>11,200</b>	<b>5%</b>	<b>800</b>

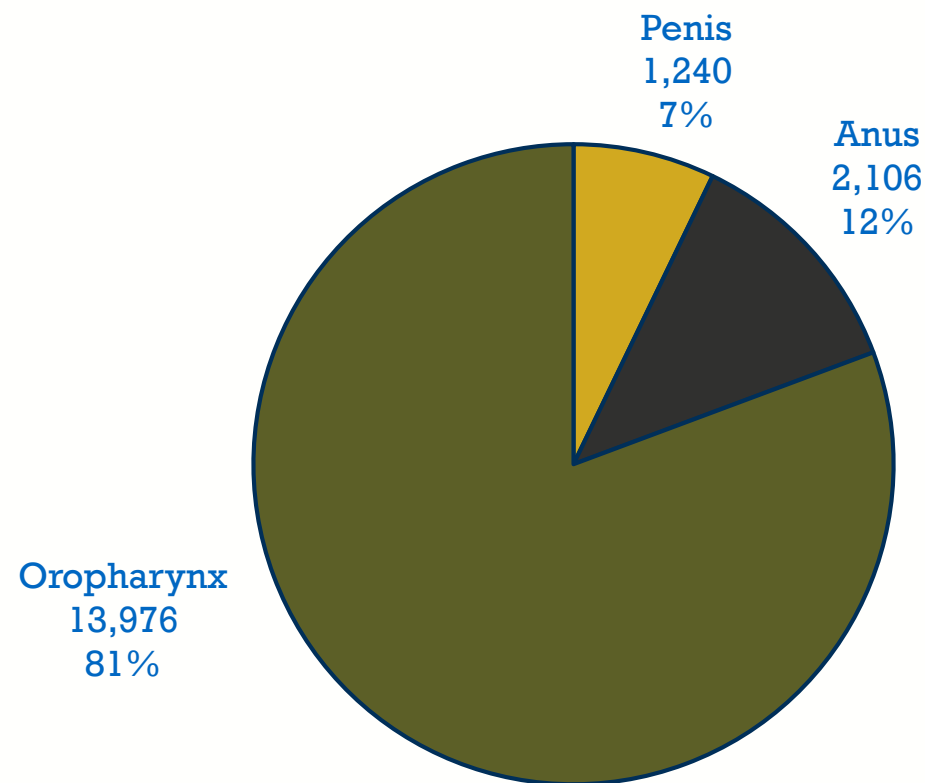
Data are from population-based registries participating in the CDC National Program of Cancer Registries and/or NCI Surveillance, Epidemiology, and End Results Program, meeting criteria for high data quality for all years 2010–2014, and covering about 99% of the US population.

# Average Number of HPV-Associated Cancers Per Year in the United States, 2010–2014

Women (N=23,716)



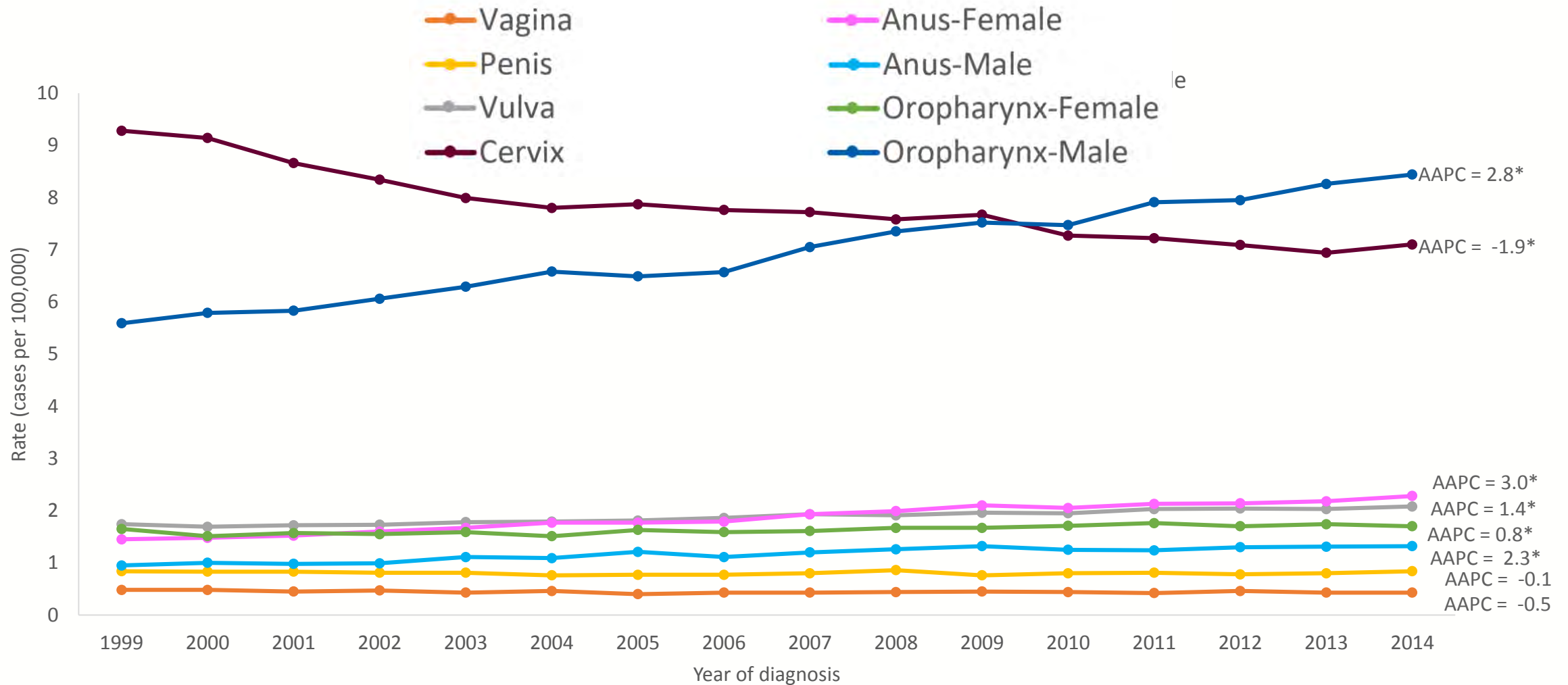
Men (N=17,322)



Data are from population-based registries participating in the CDC National Program of Cancer Registries and/or NCI Surveillance, Epidemiology, and End Results Program, meeting criteria for high data quality for all years 2010–2014, and covering about 99% of the US population. HPV-associated cancers were defined as cancers at specific anatomic sites with specific cellular types in which HPV DNA frequently is found. All cancers were confirmed histologically. Cervical cancers (ICD-O-3 site codes C53.0–C53.9) were limited to carcinomas (ICD-O-3 histology codes 8010–8671, 8940–8941). Vaginal (ICD-O-3 site code C52.9), vulvar (ICD-O-3 site codes C51.0–C51.9), penile (ICD-O-3 site codes C60.0–60.9), anal (ICD-O-3 site code C21.0–C21.9, 20.9), and oropharyngeal (ICD-O-3 site codes C01.9, C02.4, C02.8, C05.1, C05.2, C09.0, C09.1, C09.8, C09.9, C10.0, C10.1, C10.2, C10.3, C10.4, C10.8, C10.9, C14.0, C14.2 and C14.8) cancers were limited to squamous cell carcinomas (ICD-O-3 histology codes 8050–8084, 8120–8131). Based on: Viens et al. Human Papillomavirus-Associated Cancers—United States, 2008–2012. MMWR 2016;65(26):661-666.

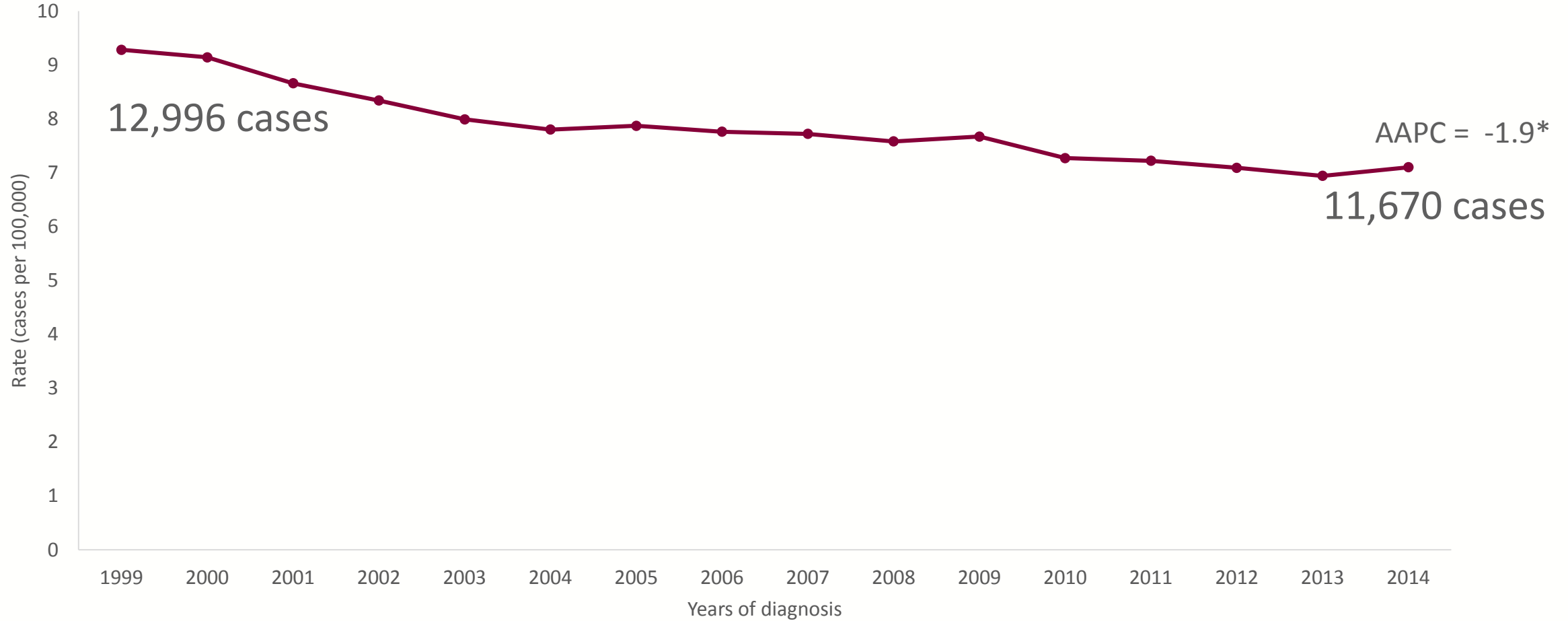


# HPV-Associated Cancers Trends — United States, 1999–2014



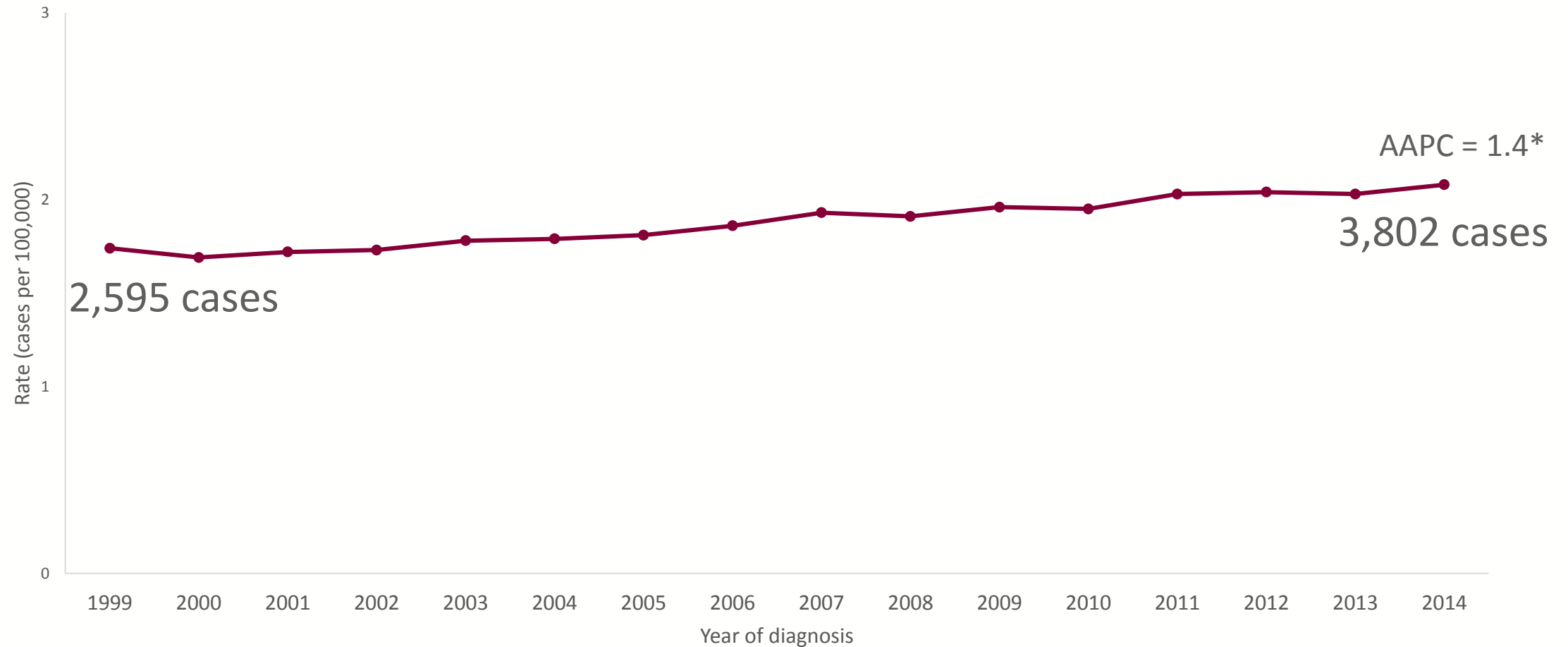
Rates were considered to increase if annual average percentage change (AAPC) >0 (p<0.05) and to decrease if AAPC <0 (p<0.05); otherwise rates were considered stable. \* = p<0.05

# Cervical Cancer Trends — United States, 1999–2014



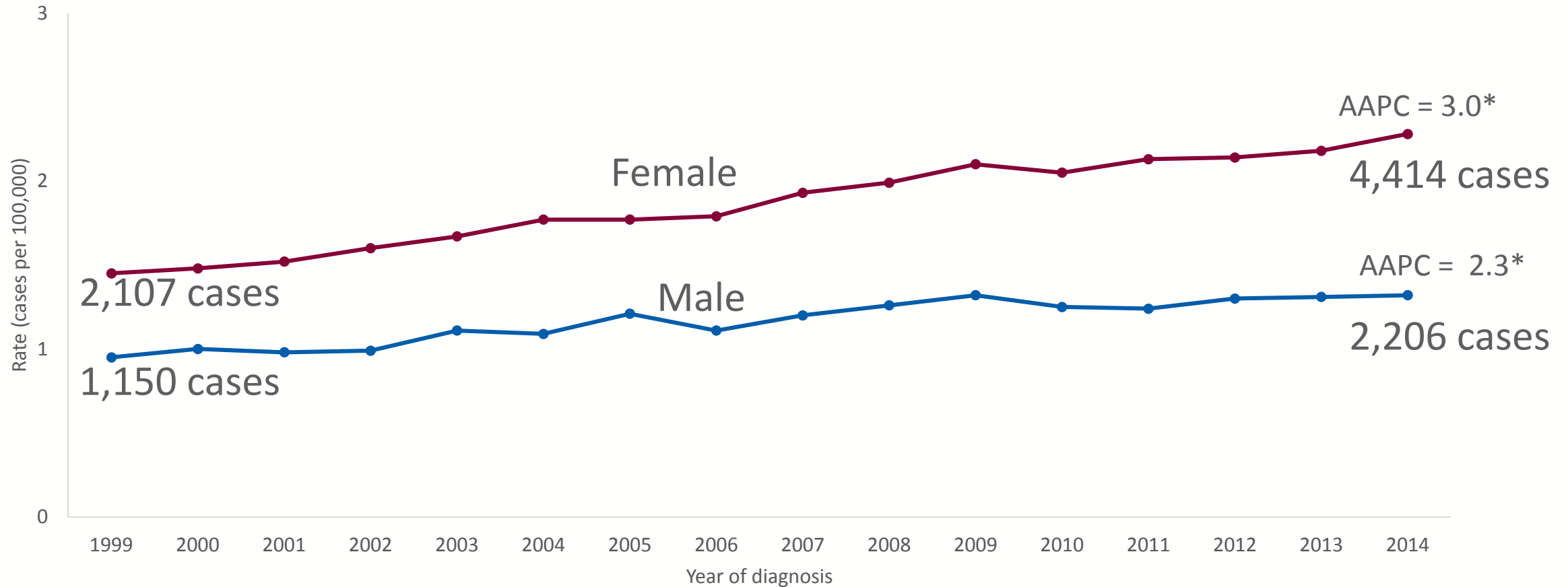
Analyses limited to cervical carcinomas. Rates were considered to increase if annual average percentage change (AAPC) >0 (p<0.05) and to decrease if AAPC <0 (p<0.05); otherwise rates were considered stable. \* = p<0.05.

# Vulvar Cancer Trends — United States, 1999–2014



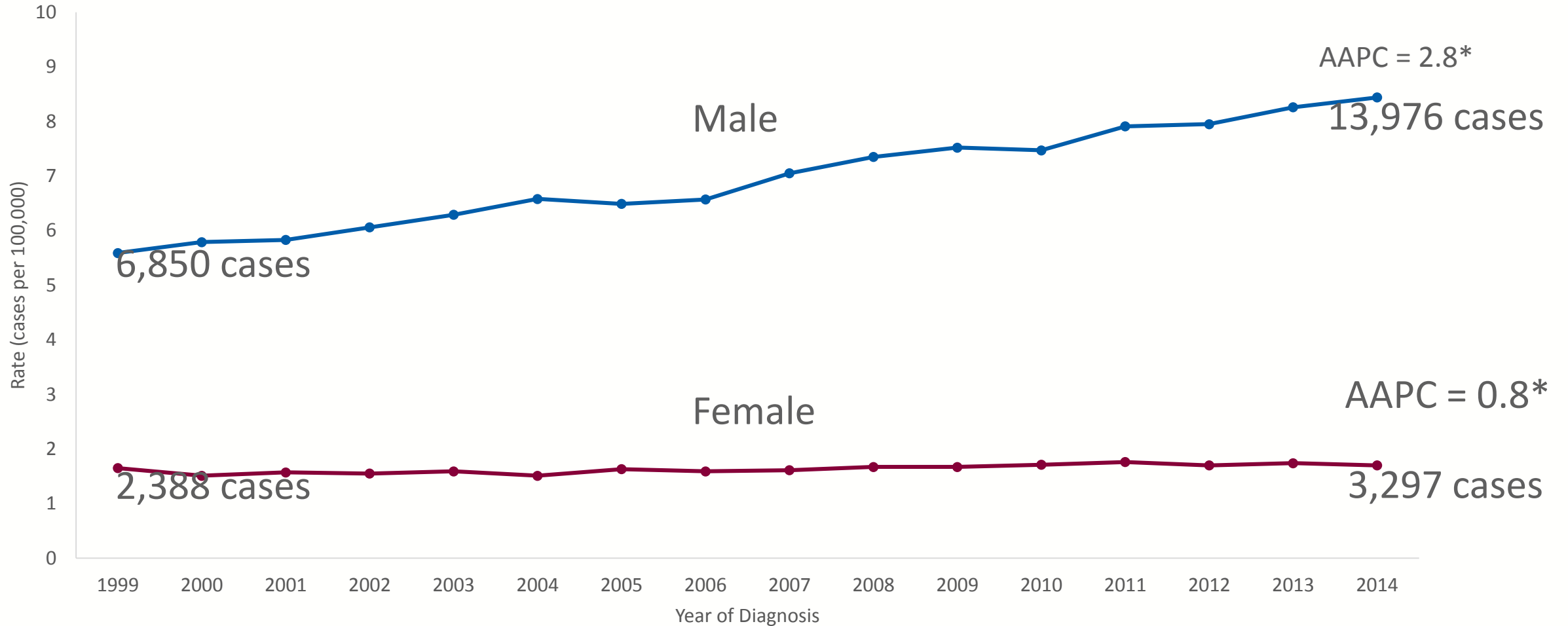
Analyses limited to vulvar squamous cell carcinomas. Rates were considered to increase if annual average percentage change (AAPC) >0 ( $p < 0.05$ ) and to decrease if AAPC <0 ( $p < 0.05$ ); otherwise rates were considered stable. \* =  $p < 0.05$ .

# Anal Cancer Trends — United States, 1999–2014



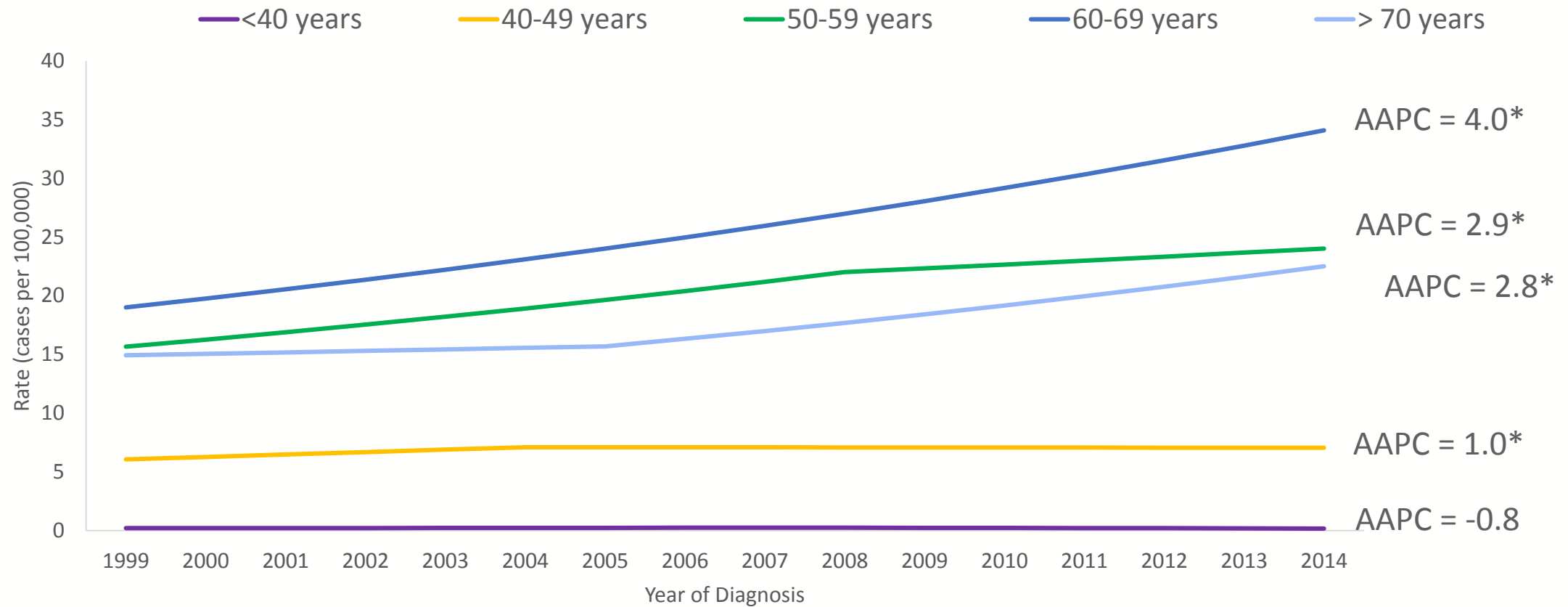
Limited to anal squamous cell carcinomas. Rates were considered to increase if annual average percentage change (AAPC) >0 ( $p < 0.05$ ) and to decrease if AAPC <0 ( $p < 0.05$ ); otherwise rates were considered stable. \* =  $p < 0.05$ .

# Oropharyngeal Cancer Trends — United States, 1999–2014



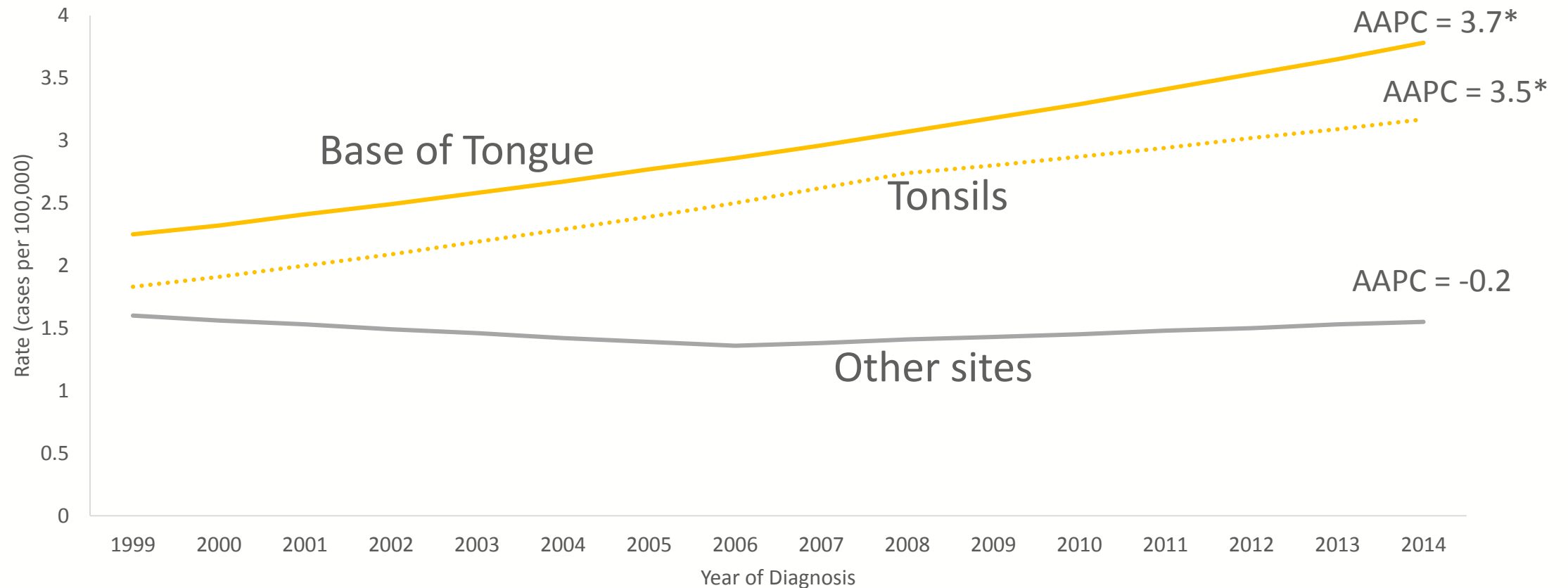
Analyses limited to oropharyngeal squamous cell carcinomas. Rates were considered to increase if annual average percentage change (AAPC) >0 (p<0.05) and to decrease if AAPC <0 (p<0.05); otherwise rates were considered stable. \* = p<0.05.

# Oropharyngeal Cancer Trends among Men by Age — United States, 1999–2014



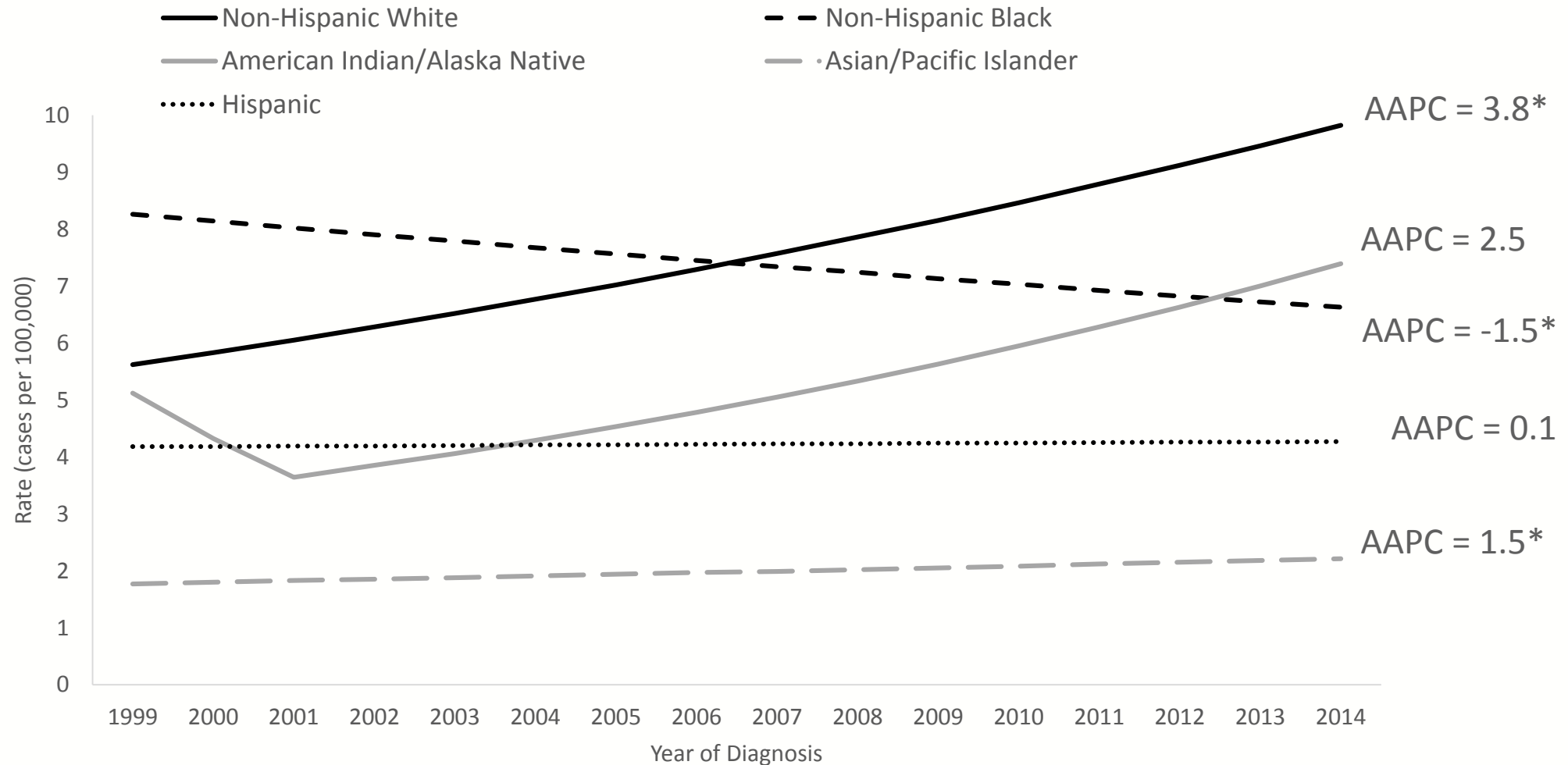
Analyses limited to oropharyngeal squamous cell carcinomas. Rates were considered to increase if annual average percentage change (AAPC) >0 (p<0.05) and to decrease if AAPC <0 (p<0.05); otherwise rates were considered stable. \* = p<0.05.

# Oropharyngeal Cancer among Men by Primary Site — United States, 1999–2014



Analyses limited to oropharyngeal squamous cell carcinomas. Rates were considered to increase if annual average percentage change (AAPC) > 0 (p < 0.05) and to decrease if AAPC < 0 (p < 0.05); otherwise rates were considered stable. \* = p < 0.05.

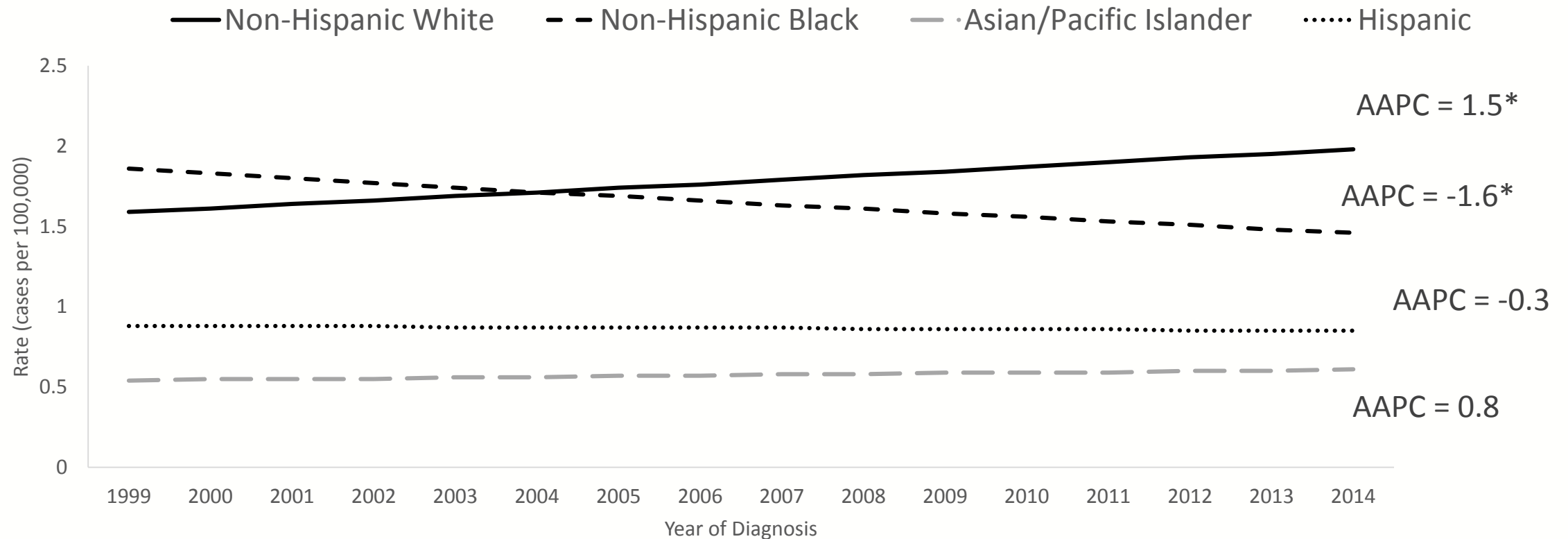
# Oropharyngeal Cancer Trends among Men by Race/Ethnicity — United States, 1999–2014



Analyses limited to oropharyngeal squamous cell carcinomas. Rates were considered to increase if annual average percentage change (AAPC) > 0 (p < 0.05) and to decrease if AAPC < 0 (p < 0.05); otherwise rates were considered stable. \* = p < 0.05.



# Oropharyngeal Cancer Trends among Women by Race/Ethnicity — United States, 1999–2014



Analyses limited to oropharyngeal squamous cell carcinomas. Trends were measured with AAPC in annual rates (per 100,000, age-adjusted to the 2000 U.S. standard population). Rates were considered to increase if AAPC >0 (p<0.05) and to decrease if AAPC <0 (p<0.05); otherwise rates were considered stable. \*Data suppressed for American Indian/Alaska due to counts. \* = p<0.05.

**How can you use this data?**

# Increasing Data Accessibility and Usability

The official federal statistics on cancer incidence and deaths, produced by the Centers for Disease Control and Prevention (CDC) and the National Cancer Institute (NCI).

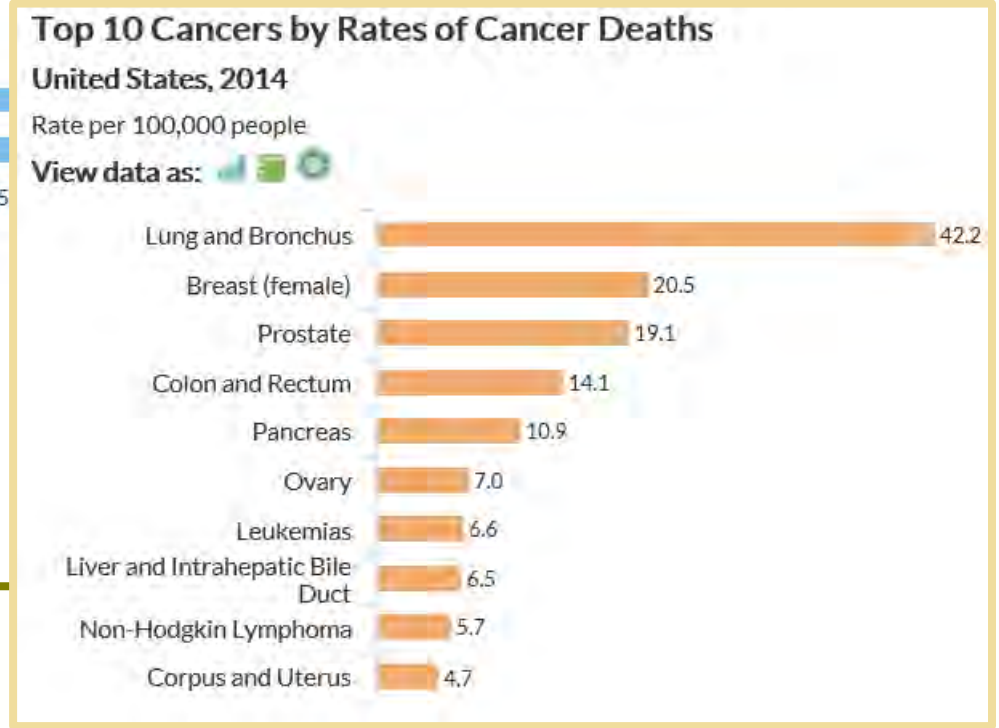
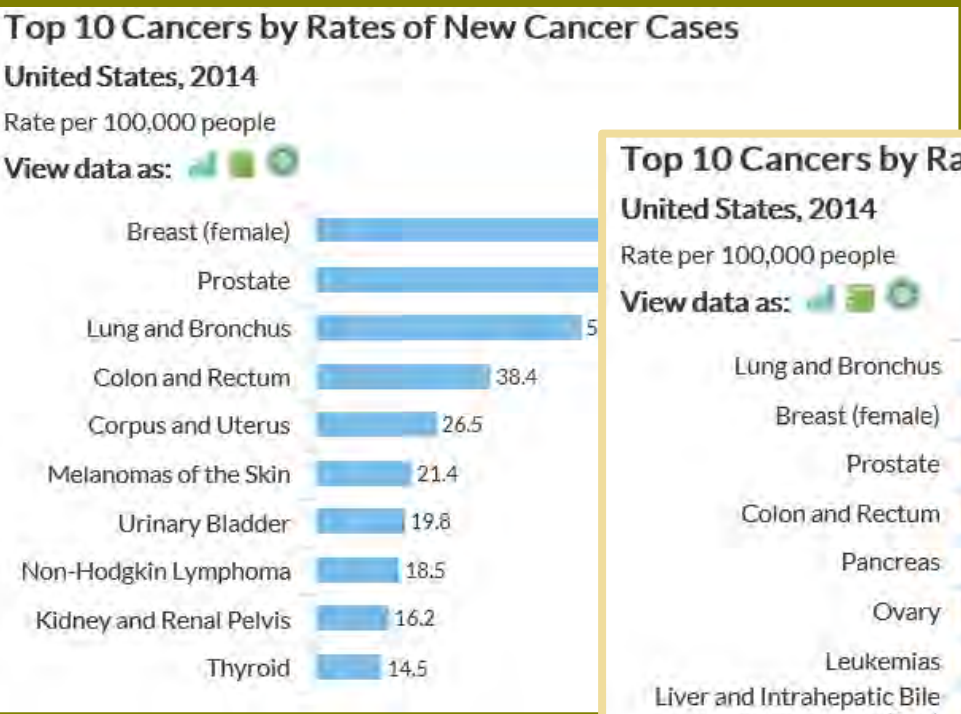
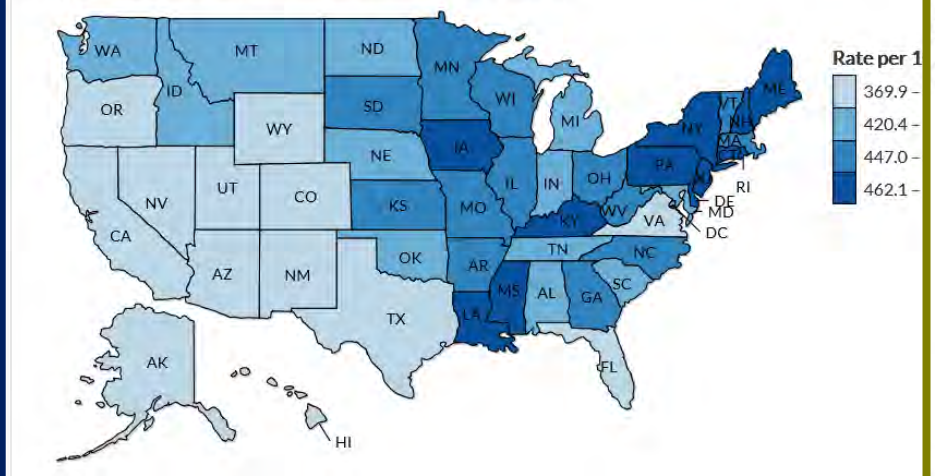
Overview | **U.S. Cancer Demographics** | Cancer Trends | State Cancer Overview | State Data and Ranking | More Information

New Cases (Incidence) or Deaths (Mortality)? Sex Cancer Type Year

Rate of New Cancers  Both Sexes  Male  Female All Types of Cancer  2014  2010-2014

## Leading Cancer Cases and Deaths, 2014

Rates of New Cancer Cases in the United States  
All Types of Cancer, All Ages, All Races/Ethnicities, Both Sexes



<https://nccd.cdc.gov/USCSDataVix/rdPage.aspx>

# CDC Resources on HPV-associated cancers

Division of Cancer Prevention and Control webpages on HPV-associated cancers <https://www.cdc.gov/cancer/hpv/index.htm>

The screenshot shows the CDC website page for HPV and Cancer. At the top left is the CDC logo and the text "Centers for Disease Control and Prevention CDC 24/7: Saving Lives, Protecting People™". To the right is a search bar with the word "SEARCH" and a magnifying glass icon. Below the search bar is a blue button labeled "CDC A-Z INDEX" with a downward arrow. The main heading is "HPV and Cancer". Below this is a breadcrumb trail: "CDC > Cancer Home > HPV and Cancer". The main title is "Human Papillomavirus (HPV) and Cancer". To the left of the main content is a sidebar with a menu: "HPV and Cancer", "Basic Information +", "Statistics +", "What CDC Is Doing", and "Related Links". Below the menu is a "Stay Informed" section with icons for Twitter, email, and RSS. To the right of the main title are social media icons for Facebook, Twitter, and a plus sign, and a language dropdown menu set to "English (US)". Below the title is a photograph of a healthcare provider talking to a woman and a child. The text below the photo states: "Human papillomavirus (HPV) causes most cervical cancers, as well as some cancers of the [vagina](#), [vulva](#), penis, anus, rectum, and [oropharynx](#) (cancers of the back of the throat, including the base of the tongue and tonsils). **HPV vaccines are recommended for preteen girls and boys to protect against HPV infection.** All kids who are 11 or 12 years old should get the HPV vaccine. Teens who did not get the vaccine or did not get all doses when they were younger should get it now. **Two screening tests can help prevent cervical cancer or find it early.** The Pap test is recommended for women between ages 21 and 65. If you are 30 years old or older, you may choose to have an HPV test along with the Pap test." Below the text are two sections: "Statistics" and "CDC's Latest Research". The "Statistics" section says: "Each year, about 39,800 new cases of cancer are found in parts of the body where HPV is often found. HPV causes about 31,500 of these cancers." The "CDC's Latest Research" section has a bullet point: "Primary HPV testing: U.S. women's awareness and acceptance of an emerging screening modality" with an external link icon.

# **CDC Resources on HPV-associated cancers**

## **US Cancer Statistics (USCS) data briefs on CDC Cancer website**

- **DCPC produces two data briefs or reports describing HPV-associated cancers.**
- **One brief summarizes national data, the other focuses on state-specific data**
- **First briefs produced this year, with 2010 - 2014 data (most recent cancer data). They will be produced annually incorporating most recent data.**
- **Briefs will be available on the DCPC website**

# CDC Resources on HPV-associated cancers

US Cancer Statistics (USCS) data briefs on CDC Cancer website

## United States Cancer Statistics DATA BRIEF

No. 1  
November 2017



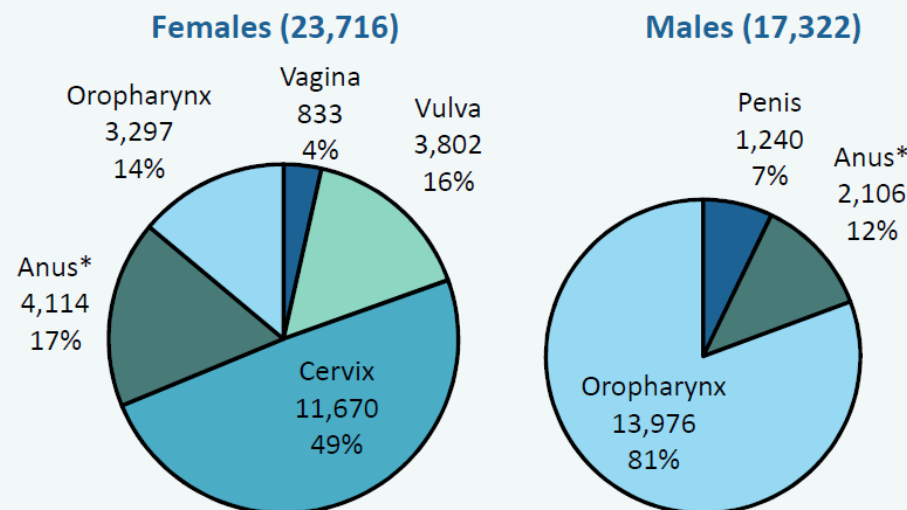
### Cancers associated with human papillomavirus, United States—2010–2014

Human papillomavirus (HPV) is a recognized cause of cancer. Although most HPV infections are asymptomatic and clear spontaneously, persistent infections can progress to precancer or cancer. HPV causes most cervical cancers, as well as some cancers of the vagina, vulva, penis, anus, and oropharynx (cancers of the back of the throat, including the base of the tongue and tonsils). Cancer registries do not routinely collect information about HPV status, so in this report, **HPV-associated cancers** are defined as those that occur in parts of the body where HPV is often found.

#### Number of new HPV-associated cancer cases each year

Based on data from 2010 to 2014 about 41,000 new cases of HPV-associated cancers occurred in the United States each year, including about 23,700 among women, and about 17,300 among men.

Cervical cancer is the most common HPV-associated cancer among women, and oropharyngeal cancers (cancers of the back of the throat, including the base of the tongue and tonsils) are the most common among men.



# CDC Resources on HPV-associated cancers

## US Cancer Statistics (USCS) data briefs on CDC Cancer website

United States Cancer Statistics

### DATA BRIEF

No. 2

March 2018

#### Cancers associated with human papillomavirus by state, 2010–2014

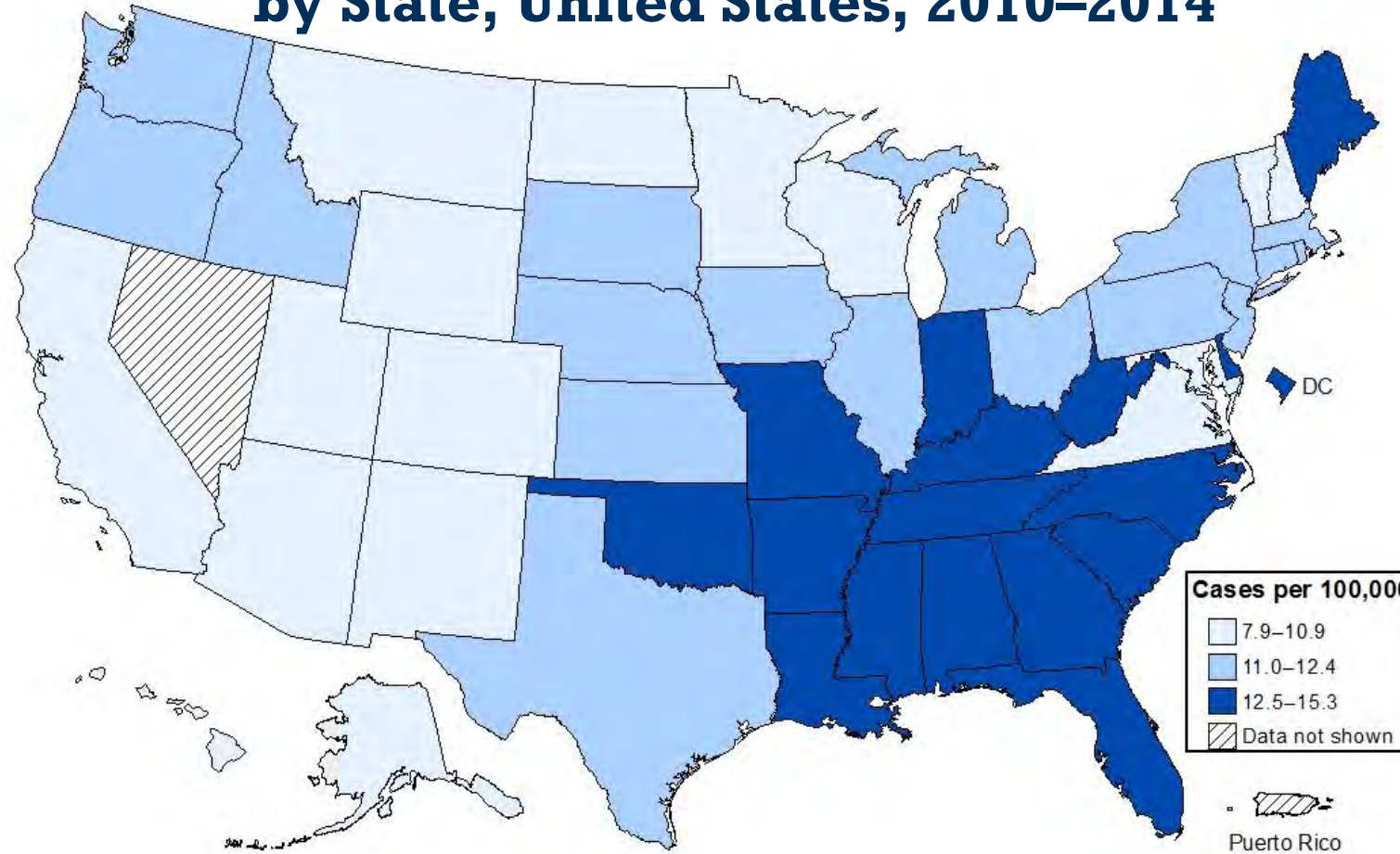
Human papillomavirus (HPV) causes almost all cervical cancers, as well as some cancers of the vagina, vulva, penis, anus, and oropharynx (cancers of the back of the throat, including the base of the tongue and tonsils). In this report, **HPV-associated cancers** are defined as those that occur in parts of the body and cancer cell types where HPV is often found because cancer registries do not routinely collect information about HPV status.

The following tables present the average annual age-adjusted rate and number of cases by sex, cancer type, and state for the time period 2010 to 2014. HPV-associated cancer incidence rates ranged by state from 7.9 per 100,000 persons (Utah) to 15.3 (Kentucky).

#### Annual rate and number of HPV-associated cancer cases by sex, cancer type, and state, 2010–2014

Cancer Site	Sex	Alabama		Alaska		Arizona		Arkansas		California		Colorado	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	8.1	208	5.9	20	6.0	193	9.3	139	7.0	1,366	5.7	150
Vagina	Female	0.6	17	†	†	0.3	11	0.5	9	0.4	90	0.4	10

# HPV-Associated Cancer Rates by State, United States, 2010–2014



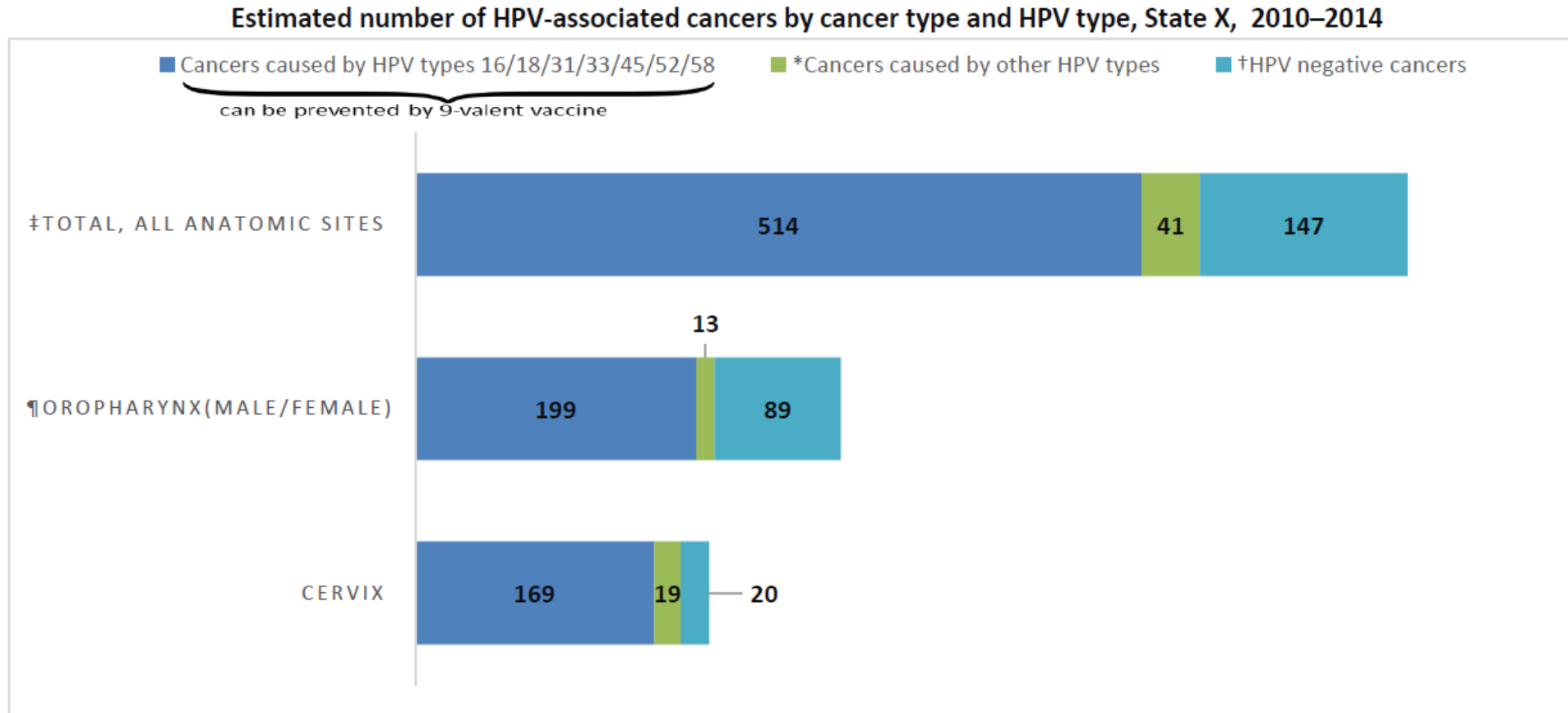
Rates are per 100,000 persons and age-adjusted to the 2000 US standard population. Data are from population-based registries participating in the CDC National Program of Cancer Registries and/or NCI Surveillance, Epidemiology, and End Results Program, meeting criteria for high data quality for all years 2010–2014, and covering about 99% of the US population. HPV-associated cancers were defined as cancers at specific anatomic sites with specific cellular types in which HPV DNA frequently is found. All cancers were confirmed histologically. Cervical cancers (ICD-O-3 site codes C53.0–C53.9) were limited to carcinomas (ICD-O-3 histology codes 8010–8671, 8940–8941). Vaginal (ICD-O-3 site code C52.9), vulvar (ICD-O-3 site codes C51.0–C51.9), penile (ICD-O-3 site codes C60.0–60.9), anal (ICD-O-3 site code C21.0–C21.9, 20.9), and oropharyngeal (ICD-O-3 site codes C01.9, C02.4, C02.8, C05.1, C05.2, C09.0, C09.1, C09.8, C09.9, C10.0, C10.1, C10.2, C10.3, C10.4, C10.8, C10.9, C14.0, C14.2 and C14.8) cancers were limited to squamous cell carcinomas (ICD-O-3 histology codes 8050–8084, 8120–8131). Based on: Viens et al. Human Papillomavirus- Associated Cancers—United States, 2008–2012. MMWR 2016;65(26):661–666.



# CDC Resources on HPV-associated cancers

## HPV Quarterly reports to the states

- For 2014 data (most recent national cancer data) the report focuses on cervical and oropharyngeal cancers



# **CDC Resources on HPV-associated cancers**

## **HPV Vaccination Reports to the states**

- **Brief 2-page report with state-specific data on number of HPV vaccine doses ordered and HPV-associated cancers**
- **Produced as a collaboration between CDC's Immunization Services Division (ISD) and Division of Cancer Prevention and Control (DCPC)**
- **The briefs will be distributed several times a year to program representatives in the CDC-funded National Immunization Program, National Comprehensive Cancer Control Program, and National Program of Cancer Registries.**

# CONCLUSIONS

- HPV-associated cancers include cancers of the cervix, penis, anus, vulva, and vagina. The virus is also associated with oropharyngeal cancers.
- Oropharyngeal cancer is now the most common HPV-associated cancer and increasing, particularly among males.
- The time to make sure everyone understands the importance of the HPV vaccine is now.

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Online!



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**CDC Breast Cancer**

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Go to the official source of cancer prevention information: [www.cdc.gov/cancer](http://www.cdc.gov/cancer).

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



**Division of Cancer Prevention and Control**

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