

Protecting More of Your Patients from HPV-Related Cancers

Cynthia Rand, MD, MPH
**University of Rochester School of
Medicine & Dentistry**
Division of General Pediatrics

October 30th, 2019



HPV Infection

- ▶ **Most people will be infected with at least one type of mucosal HPV at some point in their lives**
 - ▶ ~79 million Americans currently infected
 - ▶ 14 million new infections/year in the US
 - ▶ HPV infection is most common in people in their teens and early 20s
- ▶ **Most people will never know that they have been infected**

Number of HPV-Associated and HPV-Attributable Cancer Cases per Year, U.S., 2011–2015

Cancer site	Number of HPV-associated cancers	Percentage probably caused by any HPV type	Number probably caused by any HPV type		
			Female	Male	Both Sexes
Cervix	11,866	91%	10,751	0	10,751
Vagina	846	75%	635	0	635
Vulva	3,934	69%	2,707	0	2,707
Penis	1,269	63%	0	803	803
Anus*	6,530	91%	4,008	1,949	5,957
Oropharynx	18,226	70%	2,160	10,725	12,885
TOTAL	42,671	79%	20,260	13,477	33,737

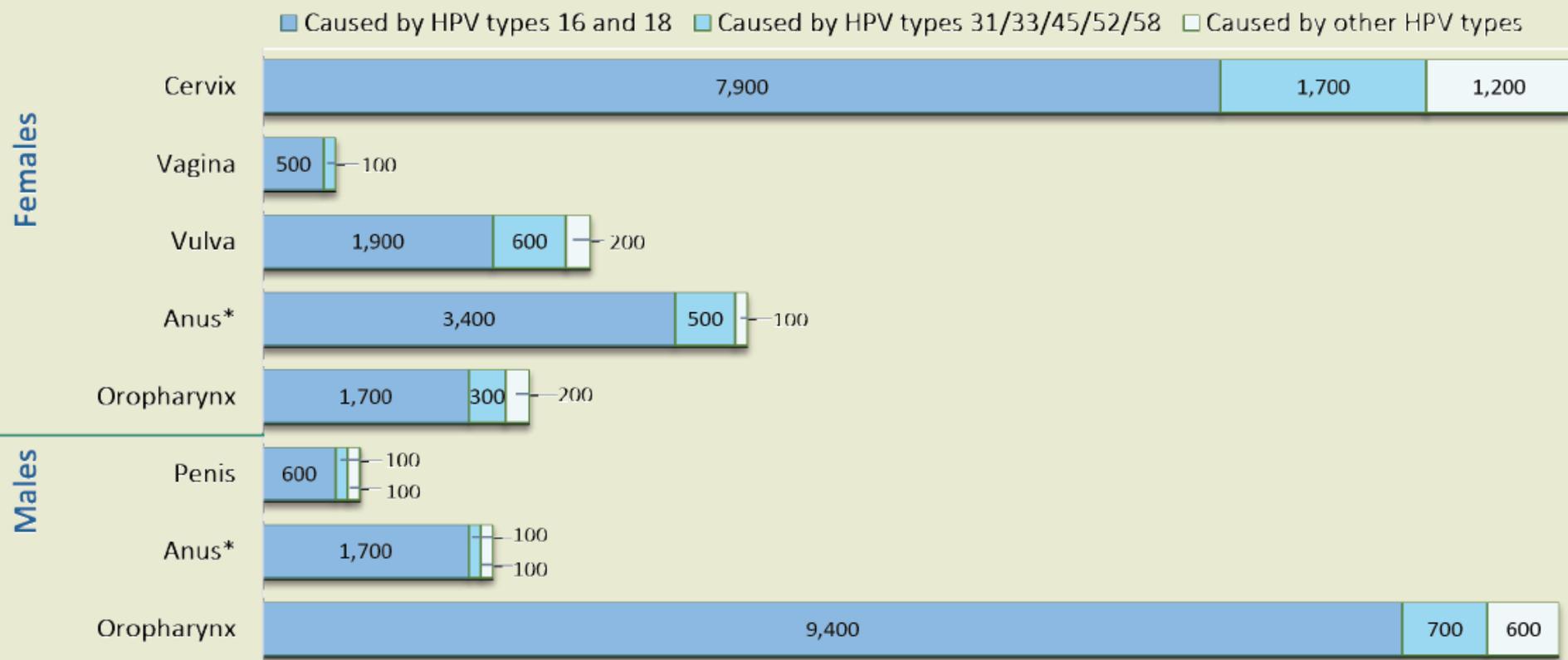
*Includes anal and rectal squamous cell carcinomas

Sources: <https://www.cdc.gov/cancer/hpv/statistics> and Saraiya M et al. J Natl Cancer Inst.

2015;107:djv086

Number of HPV-Associated and HPV-Attributable Cancer Cases per Year, U.S., 2011–2015

Estimated number of cancer cases attributable to HPV by sex, cancer type, and HPV type

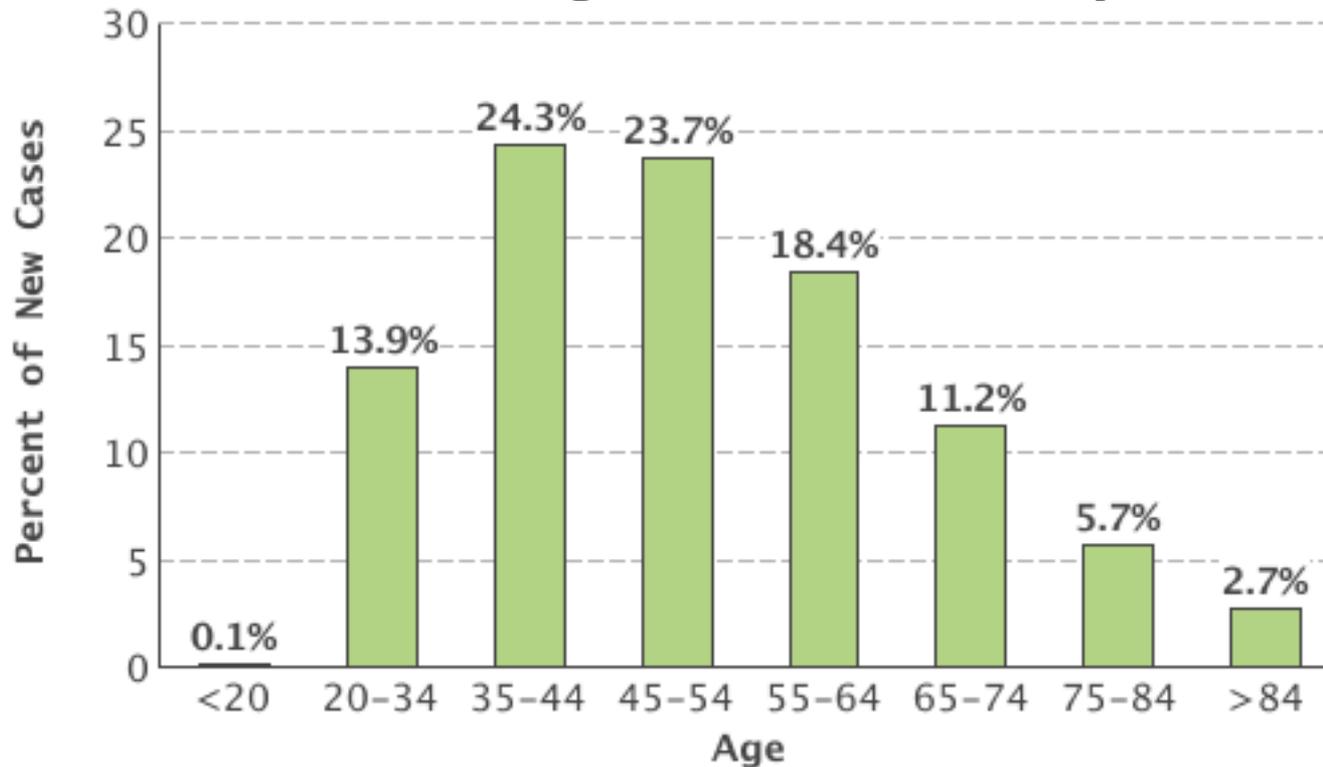


^b Includes anal and rectal squamous cell carcinomas

For each cancer type, we estimated HPV-attributable cancers by multiplying the number of cancer cases by the percentage attributable to HPV based on a genotyping study. We estimated that 33,700 cancers (79%) were attributable to HPV each year during 2011–2015. Of these, we estimated that 31,200 cancers could have been prevented by the 9-valent HPV vaccine, including 27,100 caused by HPV types 16 and 18, and 4,100 caused by HPV types 31/33/45/52/58. HPV-negative cancers are not shown in the graph; it is estimated that about 10% of cervical and anal cancers, 30% of oropharyngeal, vaginal, and vulva cancers and 40% of penile cancers are HPV-negative.

Cervical Cancer During Child-bearing Years

38% of cervical cancers occur in women between the ages of 20 & 44 years.



<http://seer.cancer.gov/statfacts/html/cervix.html>

Where is the oropharynx?

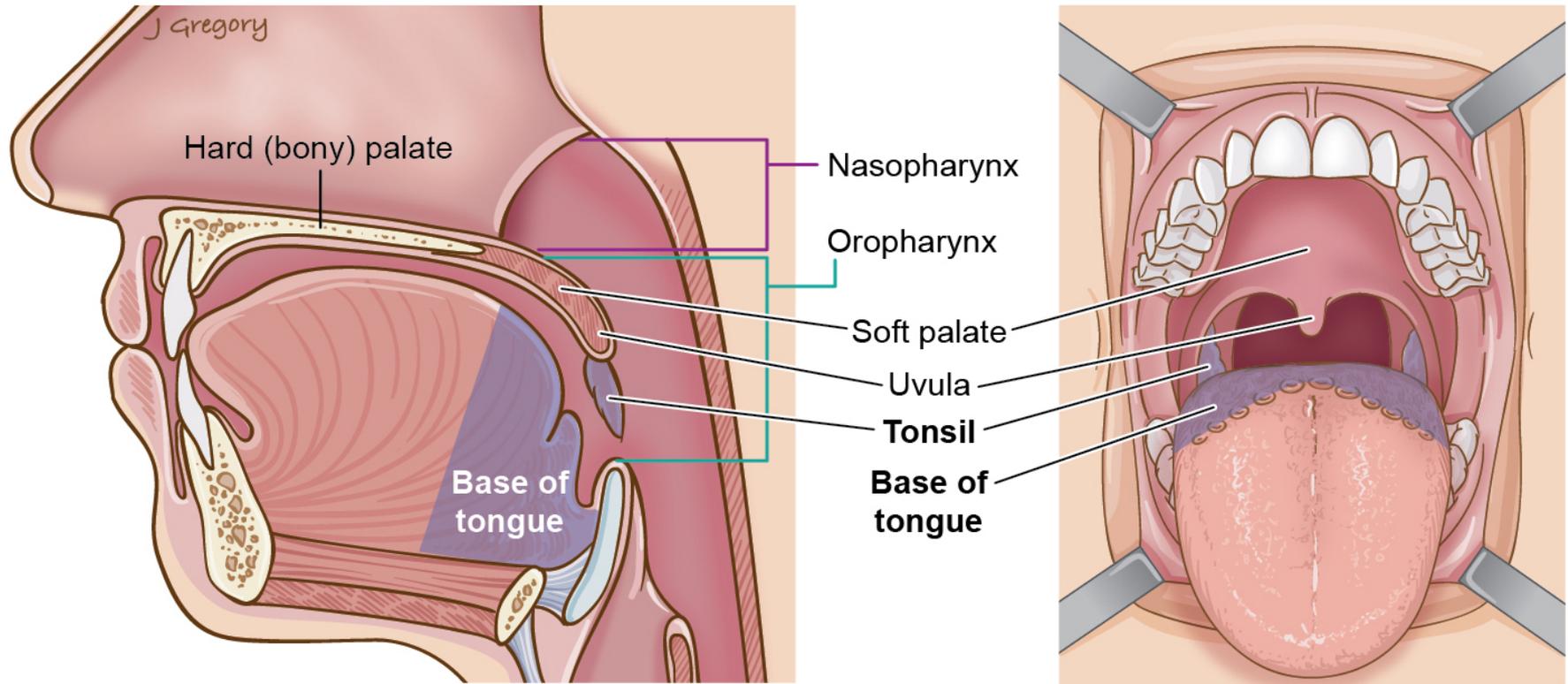
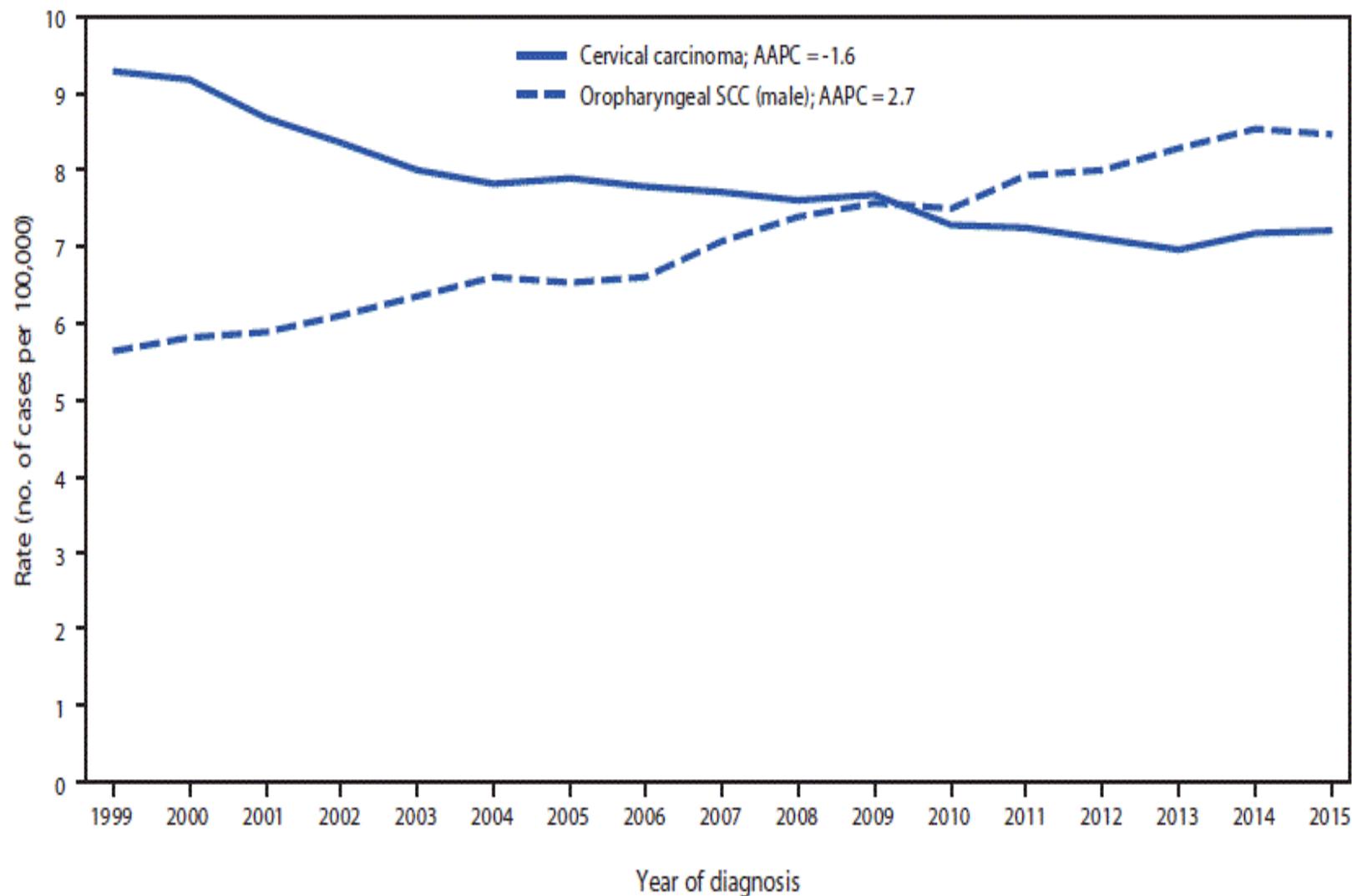


Image Source: American Cancer Society

Trends in age-adjusted incidence of cervical carcinoma among females and oropharyngeal SCC among men — US, 1999–2015



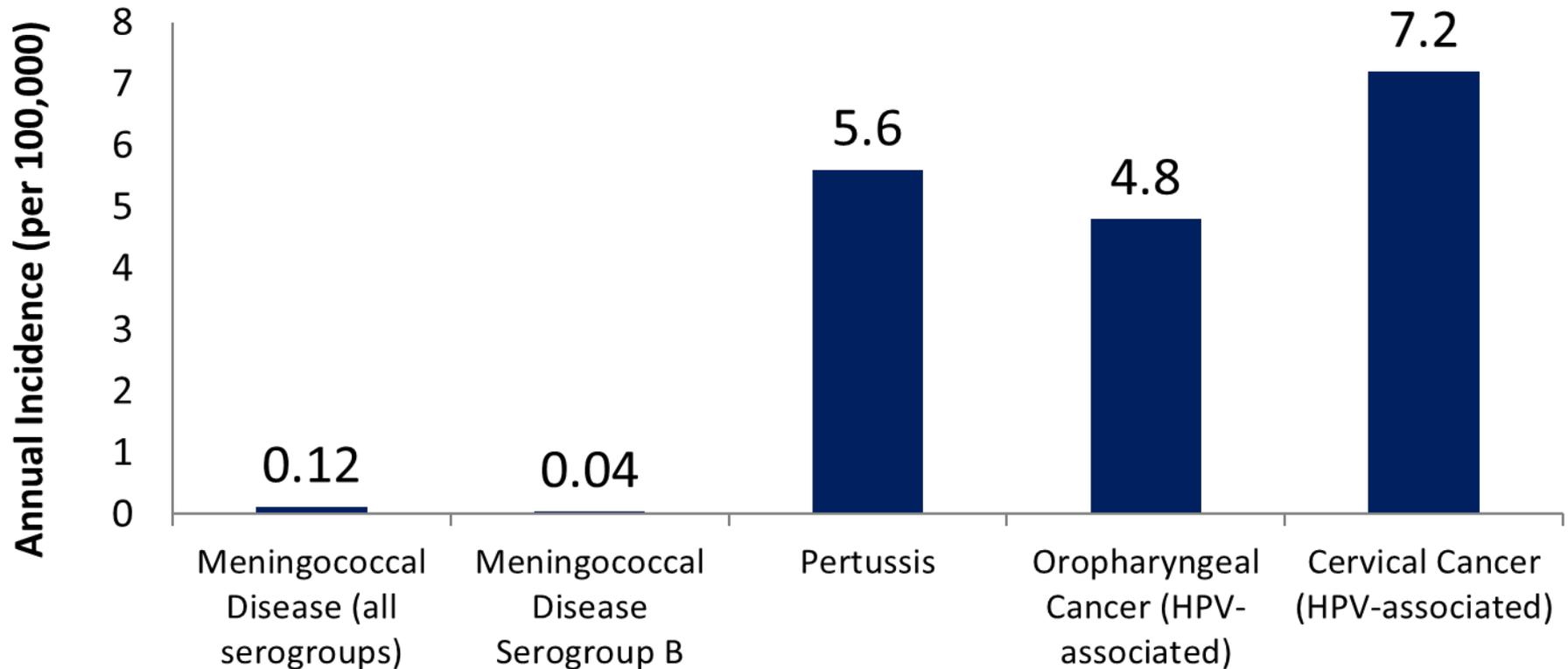
Sources: CDC's National Program of Cancer Registries; National Cancer Institute's Surveillance, Epidemiology, and End Results program.

Abbreviations: AAPC=average annual percent change; NS=not significant; SCC = squamous cell carcinoma.

Treatment of Oropharyngeal Cancer

- ➡ **Treatment depends on cancer stage**
 - ➡ **Early stage cancers:** radiation alone or surgery alone
 - ➡ **Advanced staged cancers:** require combinations of either surgery followed by radiation or concomitant chemotherapy + radiation therapy
- ➡ **Side effects of treatment** can be extensive and disruptive (e.g., may include dental decay and **tooth** loss, lack of **saliva**, **eating and speech** changes, permanent **shoulder/arm** weakness, fibrotic and atherosclerotic changes to **carotid arteries**)

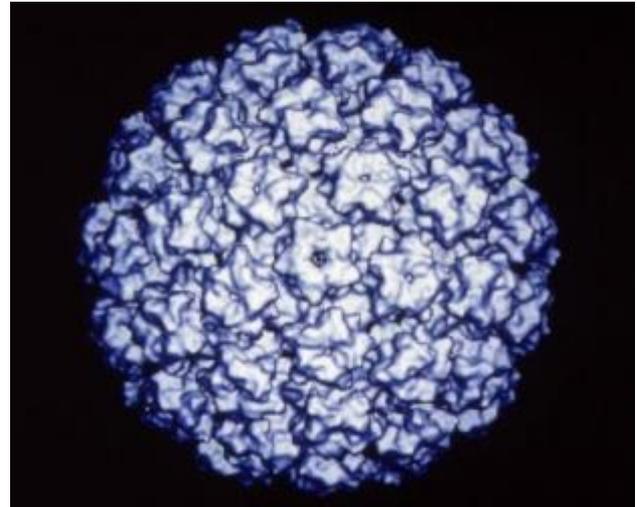
Incidence of Diseases Preventable by Adolescent Vaccine Series, US



Sources: Meningococcal Disease, CDC, 2016, <https://www.cdc.gov/meningococcal/downloads/NCIRD-EMS-Report.pdf>; Pertussis, CDC, 2016, <https://www.cdc.gov/pertussis/downloads/pertuss-surv-report-2016.pdf>; HPV, CDC, 2011-2015, <https://www.cdc.gov/cancer/hpv/pdf/USCS-DataBrief-No4-August2018-508.pdf> www.cdc.gov/mmwr/volumes/67/wr/mm6733a2.htm#T1_down

HPV Prophylactic Vaccines

- ➔ **Recombinant L1 capsid proteins that form “virus-like” particles (VLP)**
- ➔ **Non-infectious and non-oncogenic**
- ➔ **Produce higher levels of neutralizing antibody than natural infection**



HPV Virus-Like Particle

HPV Vaccine Recommendation

CDC recommends routine vaccination at age 11 or 12 years to prevent HPV cancers

- **The vaccination series can be started at age 9 years.**
- **2 doses of vaccine are recommended.**
- **The second dose of the vaccine should be administered 6 to 12 months after the first dose.**

Dosing Schedules

Starting the vaccine series before the 15th birthday

Recommended schedule is 2 doses of HPV vaccine

➡ Second dose should be administered 6–12 months after the first dose

(0, 6–12 month schedule)

➡ Minimum interval between dose 1 and dose 2 in a 2-dose schedule is 5 months

Starting the vaccine series on or after the 15th birthday – age 26*

Recommended schedule is 3 doses of HPV vaccine

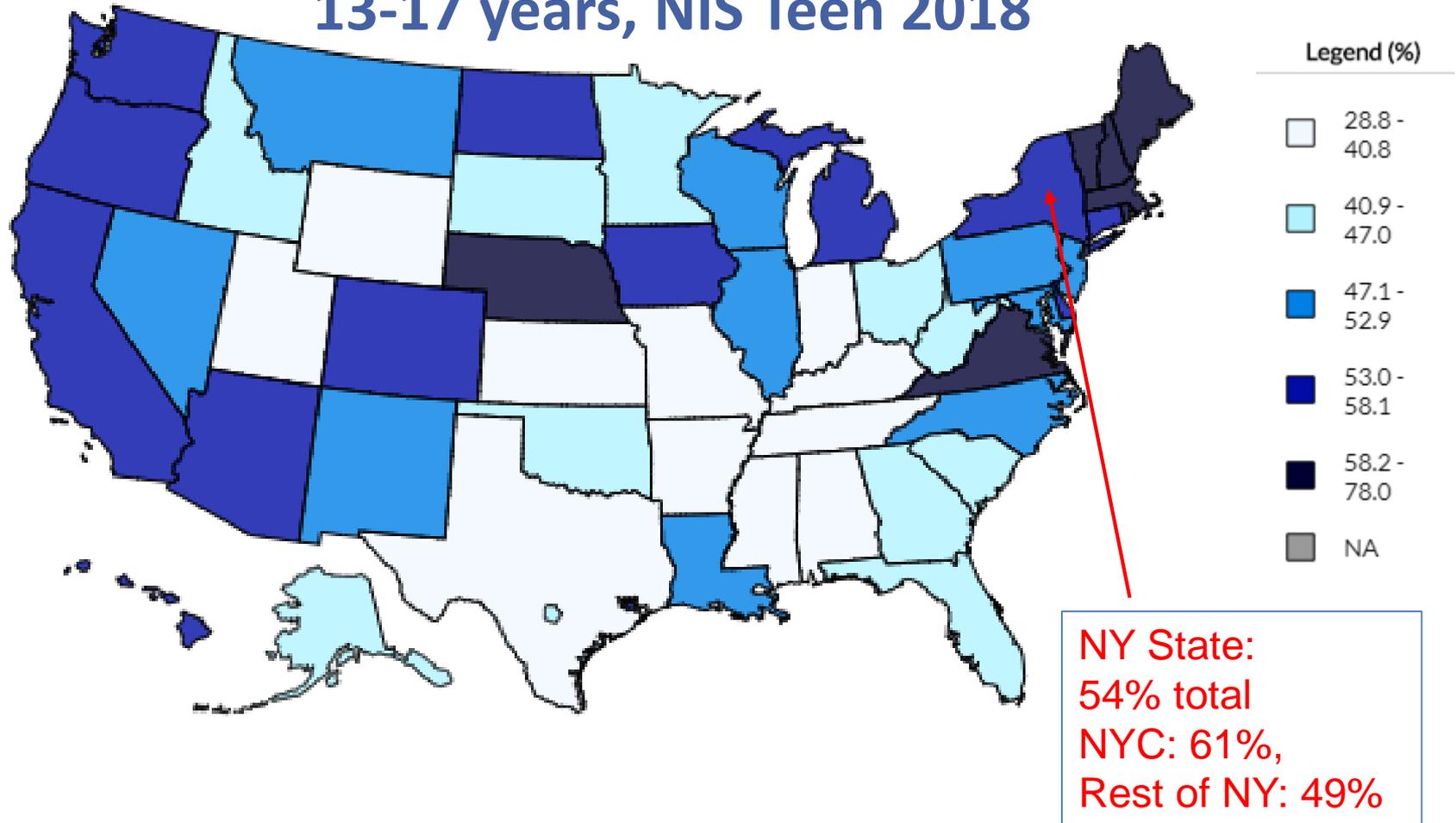
➡ Second dose should be administered 1–2 months after the first dose, and the third dose should be administered 6 months after the first dose (0, 1–2, 6 month schedule)

➡ Minimum interval between dose one and dose three in a 3-dose schedule is 5 months

*And immunocompromised persons 9-26 years

HPV Vaccine Series Completion

13-17 years, NIS Teen 2018



Over 10 Years of HPV Vaccine Safety Data

- **HPV vaccines are safe**
- **Reactions after vaccination may include:**
 - Injection site reactions: pain, redness, and/or swelling in the arm where the shot was given
 - Systemic: fever, headaches
- **HPV vaccines should not be given to anyone who has had a previous allergic reaction to the HPV vaccine or who has an allergy to yeast**
- **Brief fainting spells (syncope) and related symptoms (such as jerking movements) can happen soon after any injection, including HPV vaccine**
- **Patients should be seated (or lying down) during vaccination and remain in that position for 15 minutes**

How to improve: 2 Approaches

Increase the # of target patients who:

- 1. Come in**
- 2. Leave the office vaccinated**

1. # who come in: Patient Reminders

- ➡ For patients who haven't been in

- ➡ Phone, text, patient portal

- ➡ Follow-up doses

- ➡ Schedule 6 month or 12 month f/u when patient leaves

2. # who leave vaccinated

A) By vaccinating at every visit type

➡ Well care

➡ Chronic care

➡ Acute care

2. # who leave vaccinated

B) Standing Orders

- Empower non-physician personnel to vaccinate patients without direct physician involvement
- Preapproved orders to vaccinate on file
- Templates available for all routine vaccines at www.immunize.org/standing-orders/
- Need staff buy-in for all vaccines due

2. # who leave vaccinated

C) Provider Prompts

- ➔ Paper or EHR (better to use both)
- ➔ Engage nurses/MAs to help
- ➔ Pre-visit planning
- ➔ Huddling

Vaccinating Adults, Age 27- 45

- ▶ For adults 27-45 years, public health benefit is minimal
 - ▶ >\$300,000/QALY
- ▶ Shared clinical decision-making is recommended
- ▶ HPV vaccination does not need to be discussed with most adults ≥ 26 years
- ▶ Vaccine is most effective given before exposure to any HPV

For More Information

- **CDC:** <https://www.cdc.gov/hpv/index.html>
- **AAP:** HPV Champion Toolkit
- **Immunization Action Coalition:** <http://www.immunize.org/>
- **American Cancer Society:**
<https://www.cancer.org/healthy/hpv-vaccine.html>

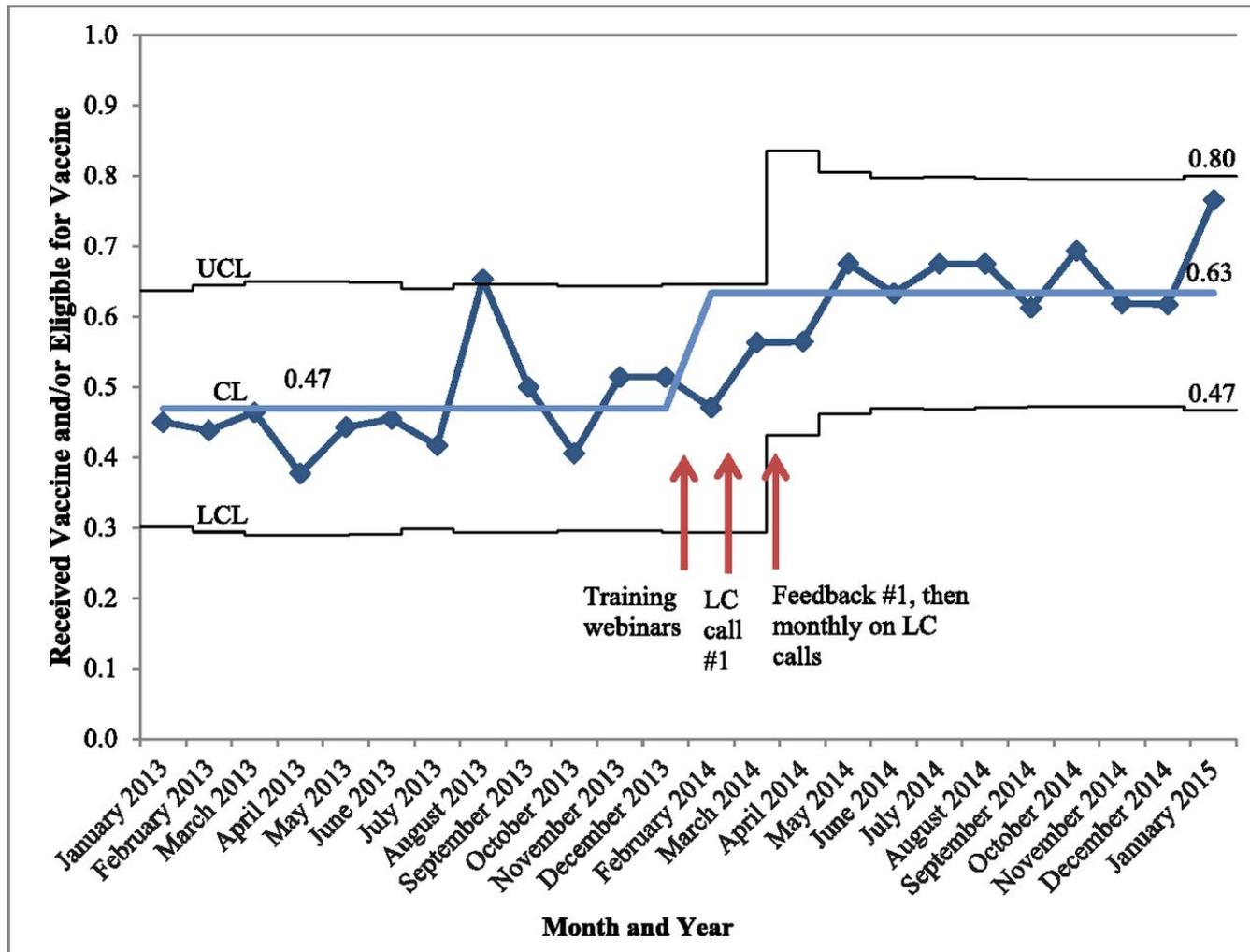
HPV VACCINE IS CANCER PREVENTION

BOX. Considerations for shared clinical decision-making regarding human papillomavirus (HPV) vaccination of adults aged 27 through 45 years

Ideally, HPV vaccination should be given in early adolescence because vaccination is most effective before exposure to HPV through sexual activity.

- HPV is a very common sexually transmitted infection. Most HPV infections are transient and asymptomatic and cause no clinical problems.
 - Although new HPV infections are most commonly acquired in adolescence and young adulthood, some adults are at risk for acquiring new HPV infections. At any age, having a new sex partner is a risk factor for acquiring a new HPV infection.
 - Persons who are in a long-term, mutually monogamous sexual partnership are not likely to acquire a new HPV infection.
 - Most sexually active adults have been exposed to some HPV types, although not necessarily all of the HPV types targeted by vaccination.
 - No clinical antibody test can determine whether a person is already immune or still susceptible to any given HPV type.
 - HPV vaccine efficacy is high among persons who have not been exposed to vaccine-type HPV before vaccination.
 - Vaccine effectiveness might be low among persons with risk factors for HPV infection or disease (e.g., adults with multiple lifetime sex partners and likely previous infection with vaccine-type HPV), as well as among persons with certain immunocompromising conditions.
 - HPV vaccines are prophylactic (i.e., they prevent new HPV infections). They do not prevent progression of HPV infection to disease, decrease time to clearance of HPV infection, or treat HPV-related disease.
- * Dosing schedules, intervals, and definitions of persons considered adequately vaccinated have not changed.

P-chart of captured opportunities for HPV vaccine, monthly chart reviews.



Cynthia M. Rand et al. Pediatrics 2018;141:e20170498