Increasing Adult HPV Vaccination Rates

October 11, 2023
Cynthia Rand, MD, MPH
Professor, Pediatrics
UR MEDICINE | GOLISANO CHILDREN'S HOSPITAL

1

Learning Objectives

By the end of this session, participants will be able to:

- Describe the burden of HPV infection and disease
- Describe HPV vaccination rates in the U.S.
- Explain HPV vaccine guidelines, effectiveness, and safety
- Understand ways to increase HPV vaccination rates

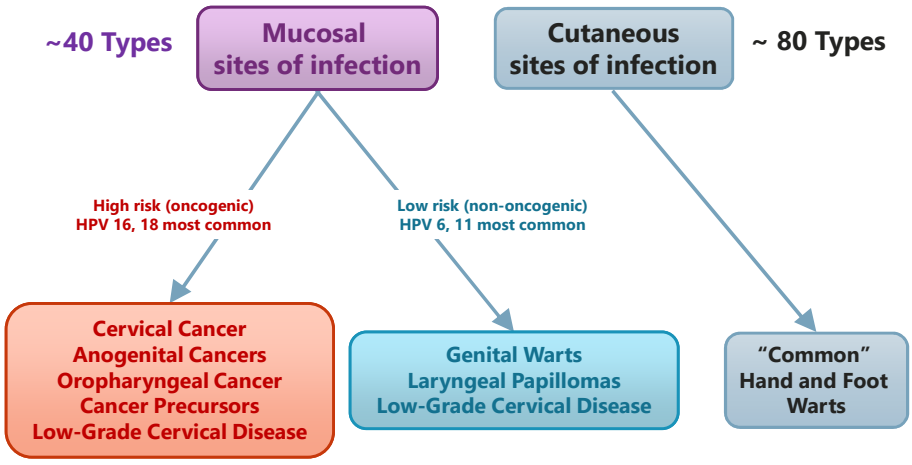
2

OBJECTIVE 1

Burden of HPV infection and disease

3

HPV Types Differ in Their Disease Associations



4

HPV Infection

- Most people will be infected with at least one type of mucosal HPV at some point in their lives
  - Estimated 42 million Americans currently infected
  - 13 million persons with a new infection/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
- Infection with one type of HPV does not prevent infection with another type
- Very rarely, vertical transmission of HPV from an infected mother to her infant can result in a condition called juvenile-onset recurrent respiratory papillomatosis.

https://www.cdc.gov/std/statistics/prevalence-2020-at-a-glance.htm

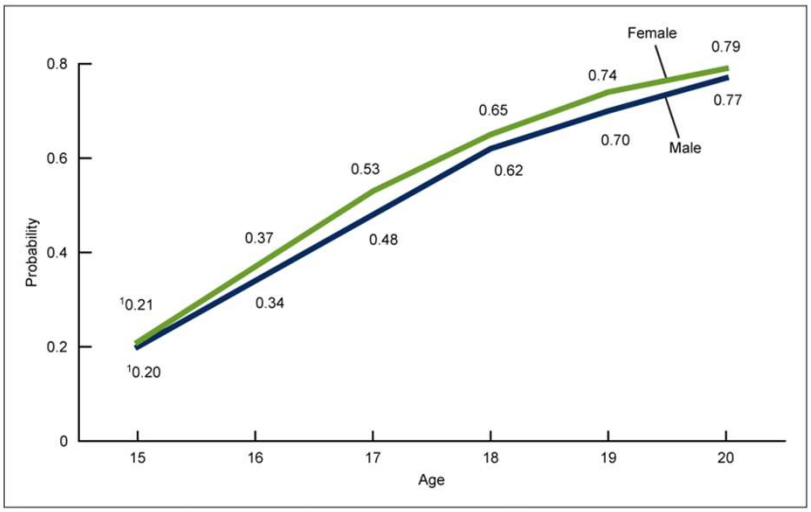
5

Risk factors for HPV infection

- Becoming sexually active at a young age
- Having multiple sexual partners
- Having >=1 partner who is considered high risk
- Lack of circumcision of male partner
- Tobacco smoking (increases risk by 2x)
- Being immunocompromised (such as HIV, organ transplant)

6

Probability of having had sex by age 15, 16, 17, 18, 19, and 20 for females and males: United States, 2015–2017



[1]Male and female teenagers had similar cumulative probabilities of having had sex at ages 15 through 20.
NOTES: Estimates are based on females and males aged 15–24 at the time of the interview. Access data table for Figure 2 at: https://www.cdc.gov/nchs/data/databriefs/db366-tables-508.pdf#2.
SOURCE: NCHS, National Survey of Family Growth, 2015–2017.

7

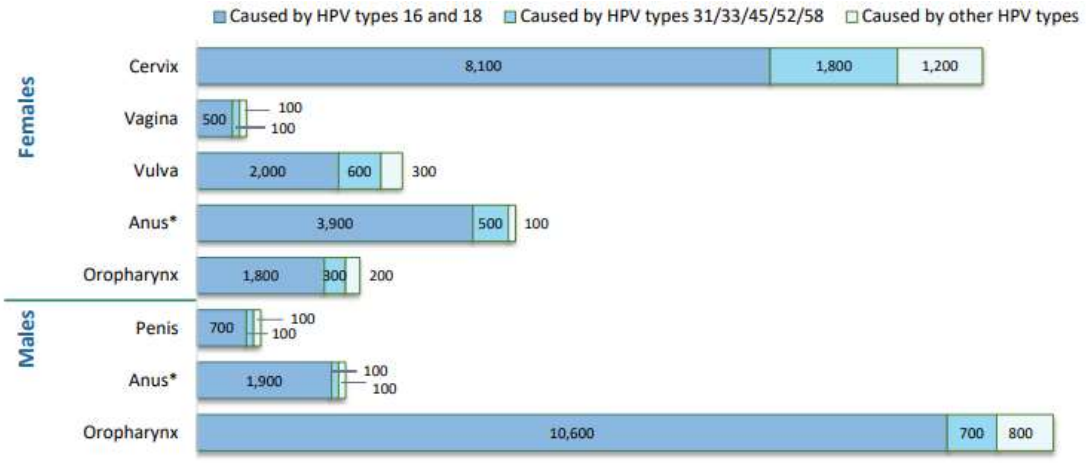
Number of HPV-Associated and Estimated Number of HPV-Attributable Cancer Cases per Year 2016-2020

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[a]	Estimated number probably caused by any HPV type[a]
Cervix	11,869	91%	10,800
Vagina	875	75%	700
Vulva	4,238	69%	2,900
Penis	1,364	63%	900
Anus[b]	7,560	91%	6,900
Female	5,150	93%	4,800
Male	2,410	89%	2,100
Oropharynx	20,805	70%	14,800
Female	3,557	63%	2,300
Male	17,248	72%	12,500
TOTAL	**46,711**	**79%**	**37,000**
Female	**25,689**	**84%**	**21,500**
Male	**21,022**	**74%**	**15,500**

https://www.cdc.gov/cancer/hpv/statistics/cases.htm

8

Number of HPV-Associated Cancer Cases Per Year, U.S., 2014–2018

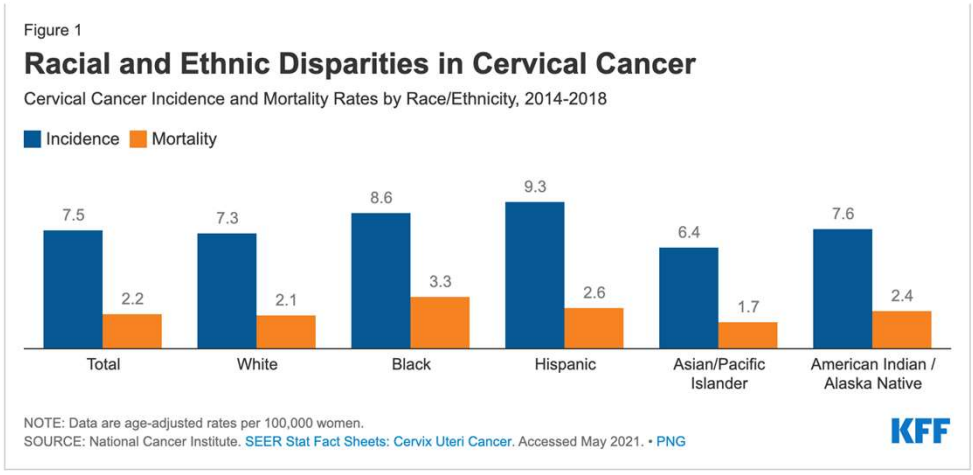


*Includes anal and rectal squamous cell carcinomas

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 36,500 cancers (79%) were attributable to HPV each year during 2014–2018. Of these, we estimated that 33,700 cancers could have been prevented by the 9-valent HPV vaccine, including 29,500 caused by HPV types 16 and 18 and 4,200 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.

9

Cervical Cancer Mortality



10

Health Disparities in Cervical Cancer

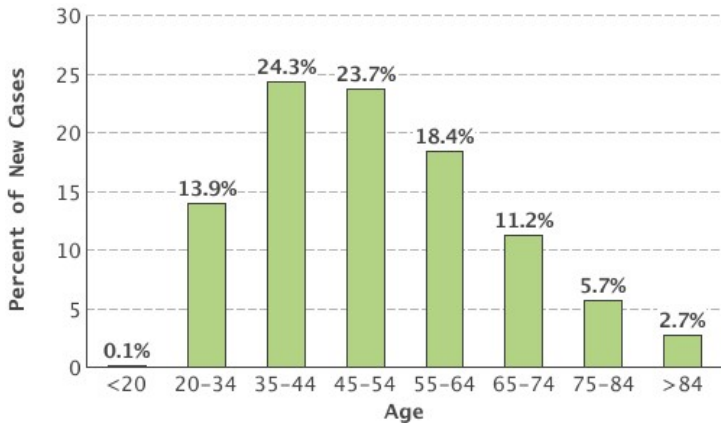
- 79% of Black women (21-49 yrs) reported having received a Pap smear in the past two years
  - 68% of White women
  - 66% of Hispanic women
  - 65% of Asian women

- Reasons for higher mortality:
  - Lower rates in follow-up treatment after an abnormal pap smear
  - differences in tumor biology
  - limited access to treatment
  - diagnosis at later stages of disease progression
  - distrust in the medical system may account for some of the disproportionate impact

11

Cervical Cancer During Child-bearing Years

38% of cervical cancers occur in women 20-44 yrs.

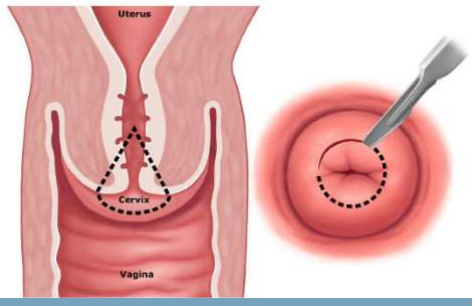


Source: http://seer.cancer.gov/statfacts/html/cervix.html

12

Even pre-cancerous lesions have implications for a woman and her offspring

~196,000 high grade cervical lesions every year



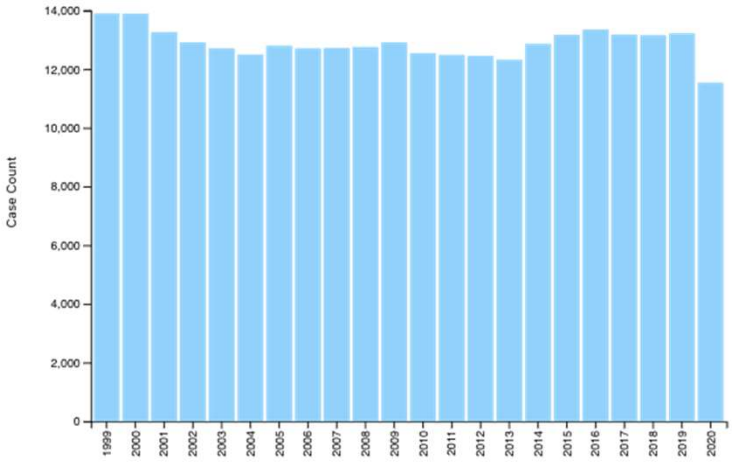
Loop electrosurgical excision procedure (LEEP) or a cold-knife cone biopsy

McClung NM, et.al. *MMWR Morb Mortal Wkly Rep*. 2019

13

Annual Number of New Cancers, 1999-2020

Cervix, United States



Source - U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2022 submission data (1999-2020): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; https://www.cdc.gov/cancer/dataviz, released in June 2023.

14

Where is the oropharynx?

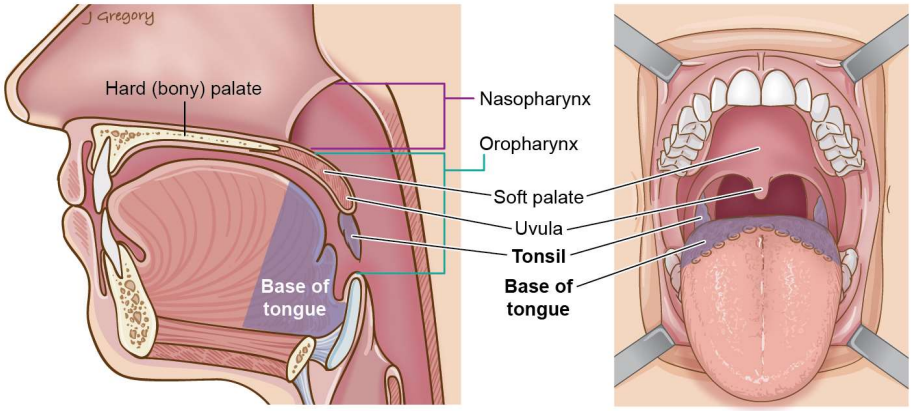
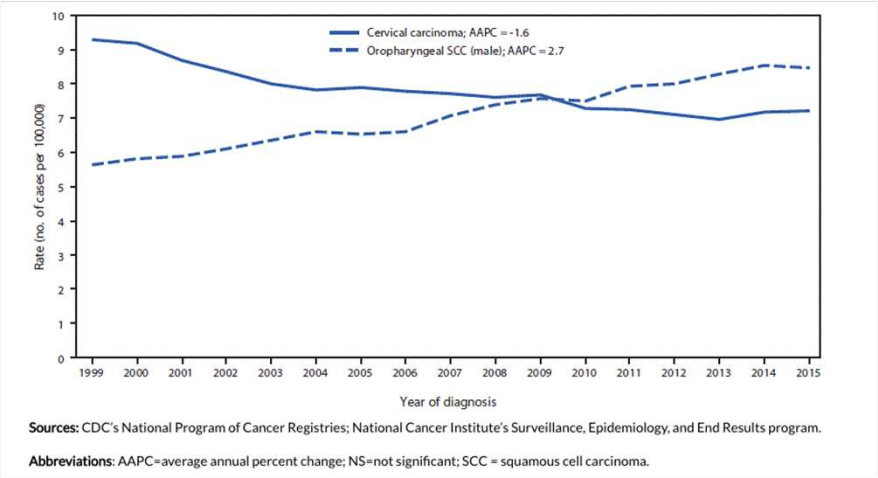


Image Source: American Cancer Society

15

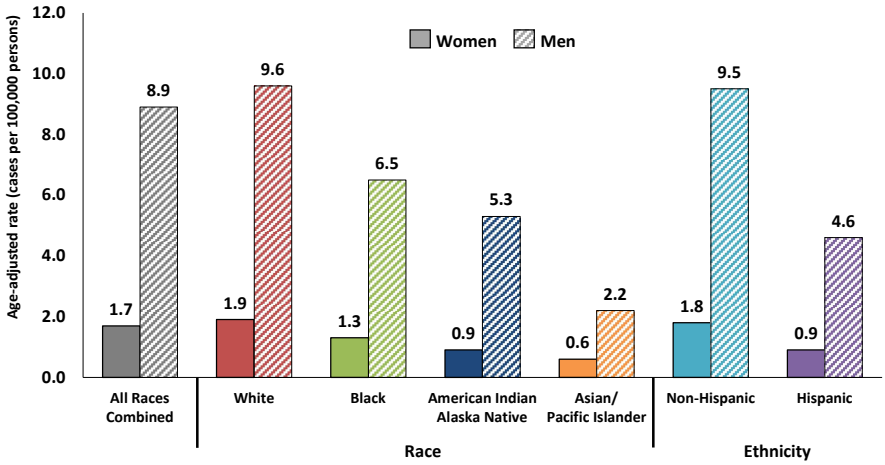
Trends in age-adjusted incidence of cervical carcinoma among females and oropharyngeal SCC among men—U.S., 1999–2015



From 2015 to 2019, incidence rates for cancers in the oropharynx linked with human papillomavirus (HPV) infection increased yearly by 1.3% in women and by 2.8% in men during that time period.

16

HPV-Associated Oropharyngeal Cancer Rates by Sex, Race, and Ethnicity, United States, 2014–2018



https://www.cdc.gov/cancer/hpv/statistics

17

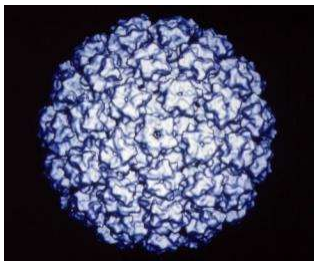
OBJECTIVE 2
HPV vaccination rates in the U.S.

18

18

HPV Prophylactic Vaccine

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



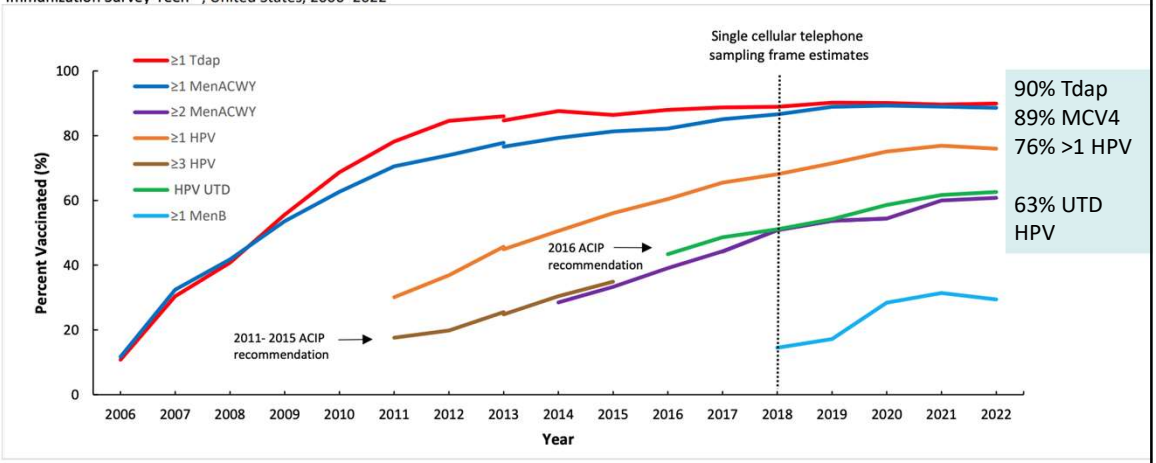
HPV Virus-Like Particle

19

19

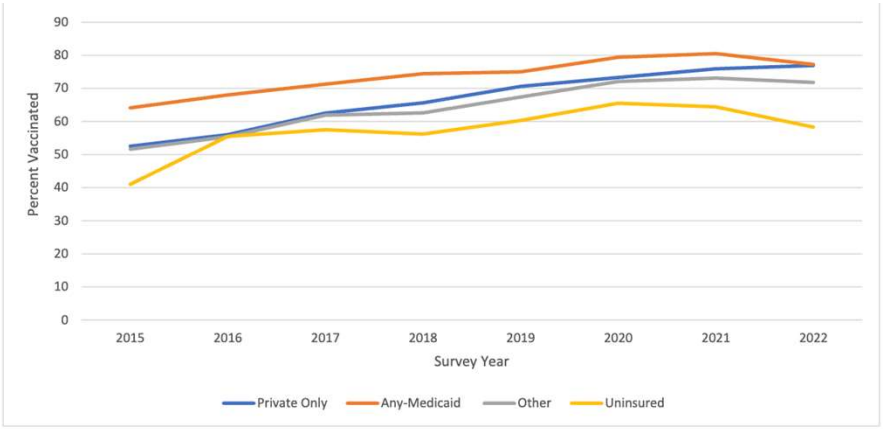
HPV Vaccination Coverage among Adolescents Aged 13-17 Years, NIS-Teen, United States, 2006-2022

Supplemental Figure 1. Estimated vaccination coverage with selected vaccines and doses*,† among adolescents aged 13-17 years, by survey year — National Immunization Survey-Teen§¶, United States, 2006–2022



20

Coverage with ≧1 HPV Vaccines aged 13-17 years by Health Insurance Status



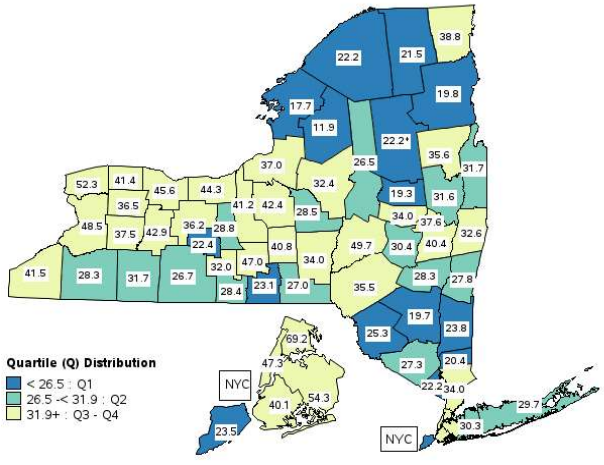
*Adolescents' health insurance status was reported by parent or guardian. "Other insurance" includes the Children's Health Insurance Program, military insurance, Indian Health Service, and any other type of health insurance not mentioned elsewhere.

21

HPV Vaccination by age 13 in NYS

Percentage of 13-year-old adolescents with a complete HPV vaccine series, 2021

Prevention Agenda 2024 Objective: 37.4

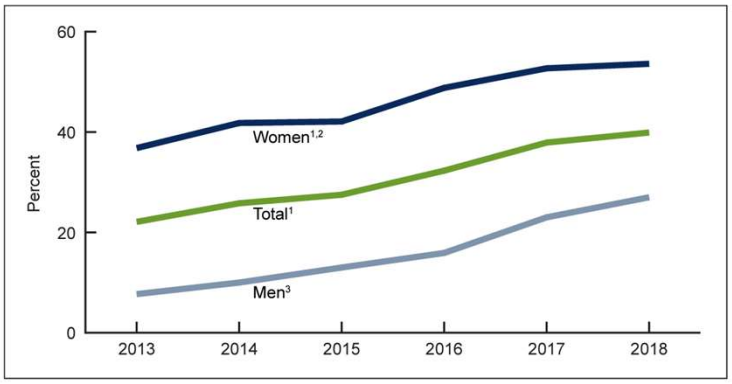


Data Source: New York State Immunization Information System (NYSIIS) and Citywide Immunization Registry (CIR), data as of October 2022

22

The percentage of adults aged 18–26 who ever received one or more doses of HPV vaccine nearly doubled between 2013 and 2018.

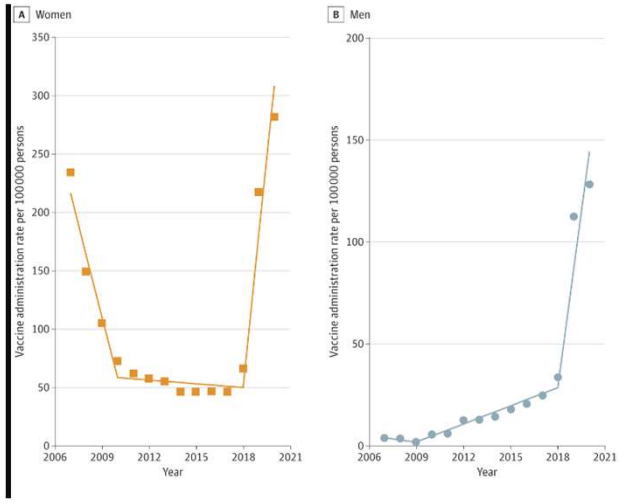
Figure 1. Percentage of adults aged 18–26 who ever received one or more doses of human papillomavirus vaccine, by year and sex: United States, 2013–2018



[1]Linear increase during 2013–2018 is statistically significant ($p < 0.05$).
[2]All percentage differences between men and women by year are statistically significant ($p < 0.05$).
[3]Quadtratic increase during 2013–2018 is statistically significant ($p < 0.05$).
NOTES: Respondents who refused to answer or who answered "Do not know" to the question asking if they had ever received one or more doses of human papillomavirus vaccine (6.5% for 2013–2018) were excluded from all analyses. Receipt of vaccination is based on self-report. Estimates are based on household interviews of a sample of the civilian noninstitutionalized population.
Access data table for Figure 1 at: https://www.cdc.gov/nchs/data/databriefs/db354_tables-508.pdf#1.
SOURCE: NCHS, National Health Interview Survey, 2013–2018.

23

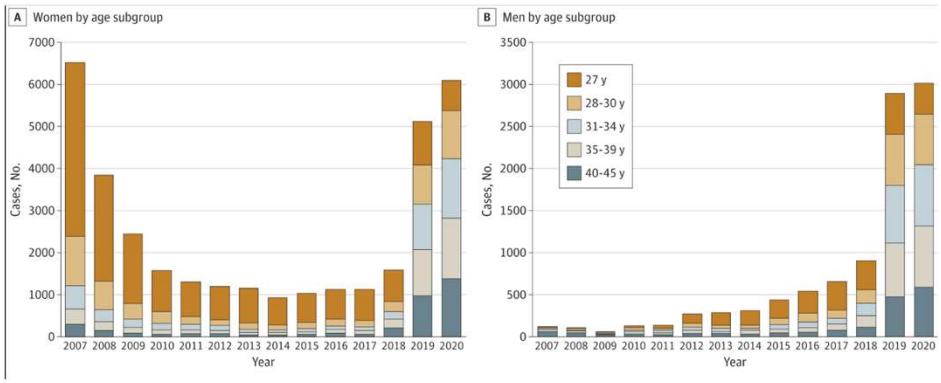
Temporal Trends of Annual Human Papillomavirus Vaccine Administration Rates in US Adults Aged 27-45 Years by Sex, 2007-2020



Suk R, Liao K, Bauer CX, Basil C, Li M. Human Papillomavirus Vaccine Administration Trends Among Commercially Insured US Adults Aged 27-45 Years Before and After Advisory Committee on Immunization Practices Recommendation Change, 2007-2020. *JAMA Health Forum.* 2022;3(12):e224716. doi:10.1001/jamahealthforum.2022.4716

24

Distribution of Annual Human Papillomavirus Vaccines Among Men and Women by Age, 2007-2020



25

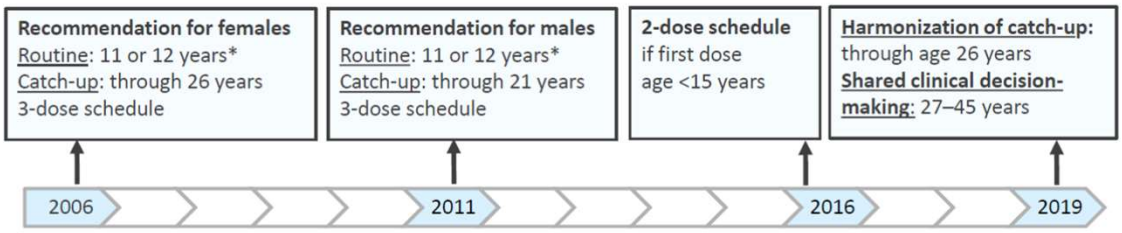
OBJECTIVE 3

HPV vaccine guidelines, effectiveness, and safety

26

26

U.S. HPV Vaccination Recommendations



*Vaccination can be started at age 9 years

6

27

Dosing Schedules

Starting the vaccine series at ages 9–14 (ideally before age 13)

Recommended schedule is
2 doses of HPV vaccine
- Second dose should be administered 6–12 months after the first dose

Starting the vaccine series at age 15–26

- 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

Source: Meites et al. *MMWR.* 2016.

28

Catch Up

- Catch-up vaccination is recommended for all persons through age 26 years.
- Nine-valent HPV vaccine may be used to continue or complete a vaccination series started with quadrivalent or bivalent HPV vaccine.
- If completed valid vaccination series with any HPV vaccine, no additional doses needed.

Source: Meites et al. *MMWR.* 2016.

29

Vaccinating Adults, Ages 27–45

- Vaccination is not recommended for everyone older than age 26 years
- Some adults ages 27–45 years may decide to get the HPV vaccine based on discussion with their clinicians
- HPV vaccination of people in this age range provides less benefit, as more have been already exposed to HPV
- Shared clinical decision making is recommended

Source: https://www.cdc.gov/mmwr/volumes/68/wr/mm6832a3.htm#B1_down

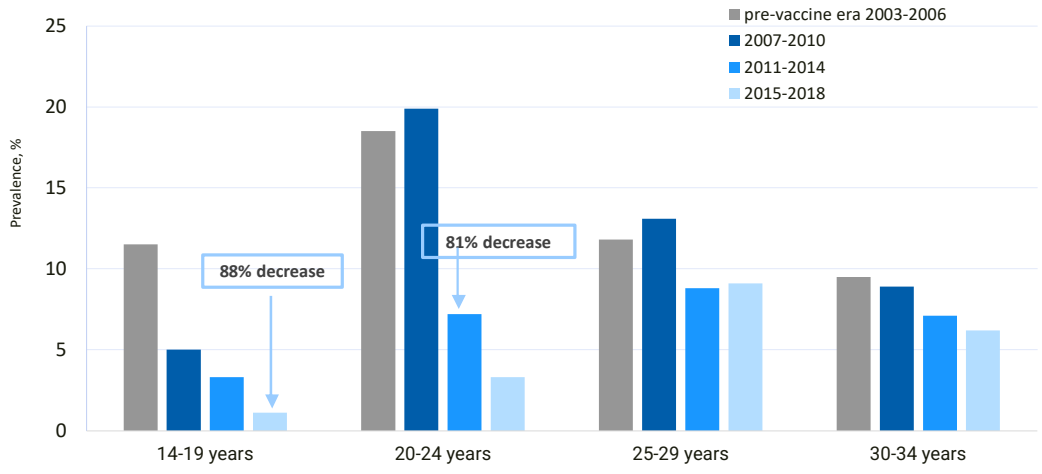
30

Patients' Questions Ages 27–45

- Most sexually active adults have already been exposed to HPV
- Having a new sex partner is a risk factor for getting a new HPV infection
- HPV vaccination prevents new HPV infections but does not treat existing infections or diseases

31

Vaccine-Type HPV Prevalence Among Females, NHANES



Rosenblum, et al. *MMWR Morb Mortal Wkly Rep.* 2021

32

Over 15 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
- Clients should be seated (or lying down) during vaccination and remain in that position for 15 minutes

33

HPV Vaccine Duration of Immunity

- Studies suggest that vaccine protection is long-lasting; no evidence of waning immunity
  - ***Available evidence*** *indicates protection for* ***at least*** *12 years*
  - *Multiple cohort studies are in progress to monitor the duration of immunity*

34

OBJECTIVE 4

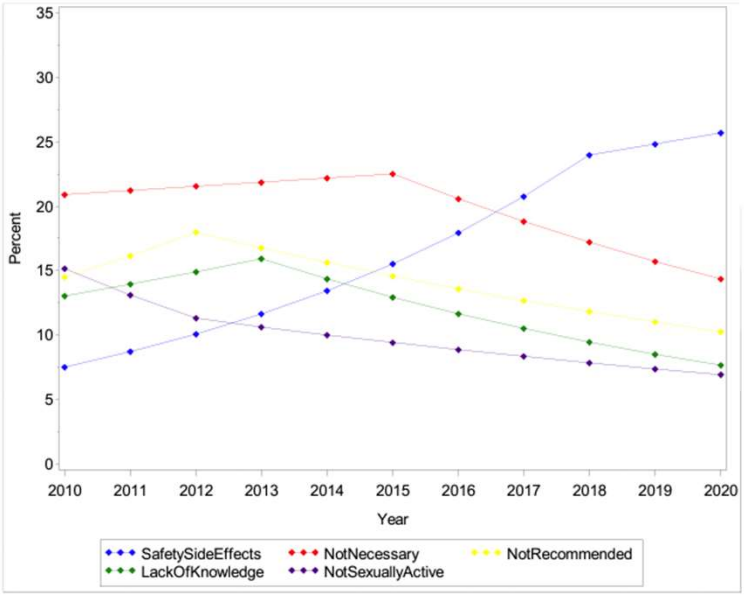
Strategies to increase HPV vaccination rates

35

35

Parents' reasons for vaccine hesitancy have changed over time

Adjei Boakye E, et al. Trends in Reasons for Human Papillomavirus Vaccine Hesitancy: 2010-2020. Pediatrics. 2023 Jun 1;151(6)



36

Make an Effective Recommendation

- **Same way: Effective recommendations group all vaccines due**
  Recommend HPV vaccination the same way you recommend other vaccines due

- **Same day: Recommend HPV vaccine TODAY**
  Recommend HPV vaccination the same day you recommend other vaccines

Source: Brewer at al. *Pediatrics*. 2017.

37

How to Improve: 2 Approaches

Increase the # of eligible patients who:

1. Come in

2. Leave the office vaccinated

38

1. Increase number who come in

Reminders:

- For patients who haven't been in
  - *Phone, text, patient portal*
- Follow-up doses
  - *Consider a reminder in your own system to send a text or phone call reminder 6–12 months later*

Outreach:

- College/community vaccination campaign
  - *Peer and provider messaging*

Barnard, M., Cole, et al. (2019). Interventions to increase uptake of the human papillomavirus vaccine in unvaccinated college students: A systematic literature review. *Preventive medicine reports*, *14*, 100884.

39

2. Increase number who leave vaccinated

A) By vaccinating at every visit type

- Preventive care
- Chronic care
- Nurse visits– flu or COVID vaccine visits

40

2. Increase number who leave vaccinated

B) Standing Orders

- Empower non-physician personnel to vaccinate clients (after assessing for specific contra-indications) without direct provider involvement
  - *Follow state laws for administration e.g., RN, LPN, LVN, MA*
- Preapproved orders to vaccinate on file, as allowed
  - *Verify laws with state medical/nursing boards*
  - *Templates available for all routine vaccines at www.immunize.org/standing-orders/*
  - *Update clinic protocols and agency policies if adopted*
- Need staff buy-in for all vaccines due

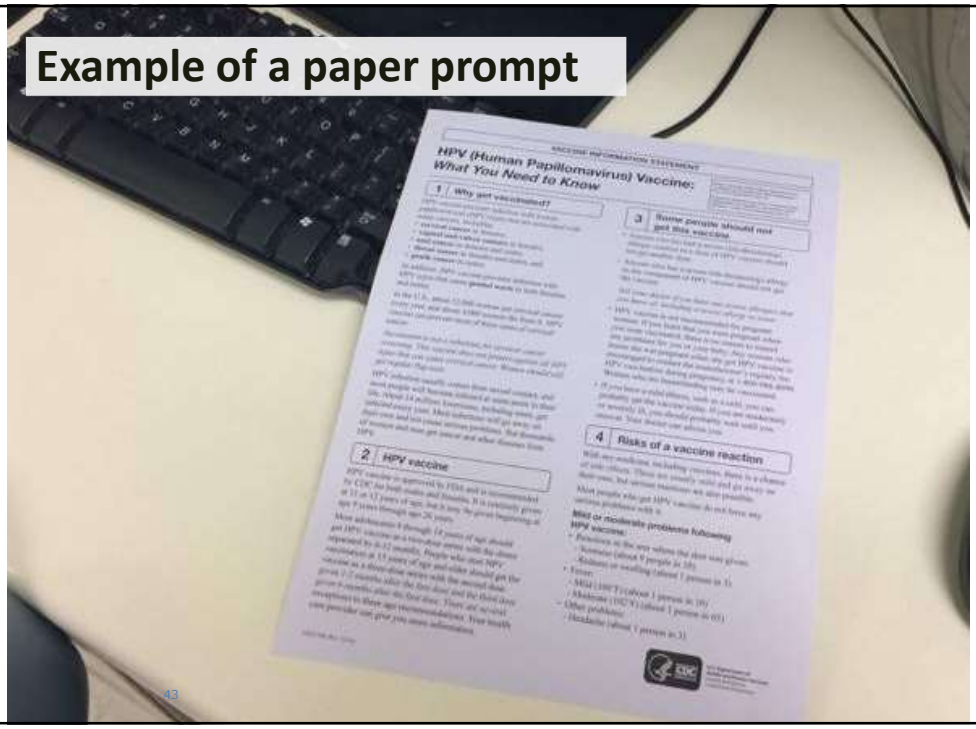
41

2. Increase number who leave vaccinated

C) Provider Prompts

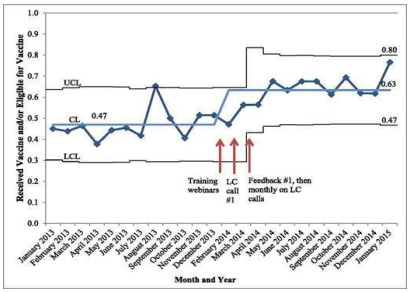
- Paper or EHR (better to use both)
- Engage nurses/MAs to help
- Pre-visit planning
- Huddling

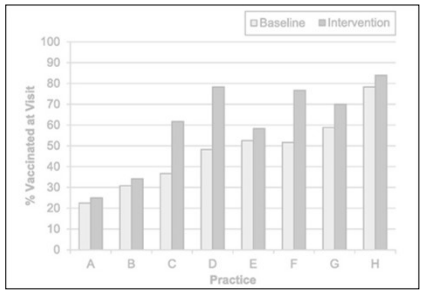
42



43

QI to Increase HPV Vaccination Rates

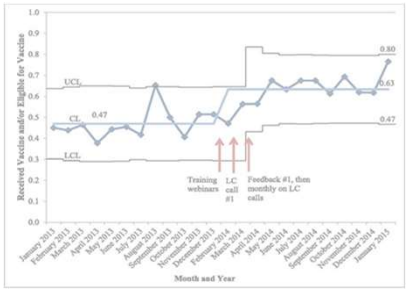


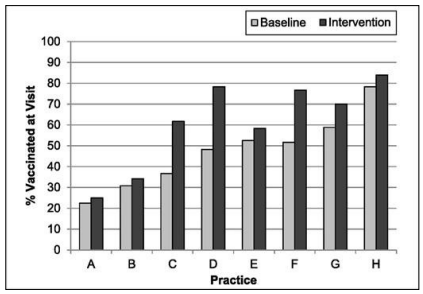


Rand CM, Schaffer SJ, Dhepyasuwan N, et al. **Provider Communication, Prompts, and Feedback to Improve HPV Vaccination Rates in Resident Clinics.** Pediatrics. 2018 Apr;141(4)

44

QI to Increase HPV Vaccination Rates

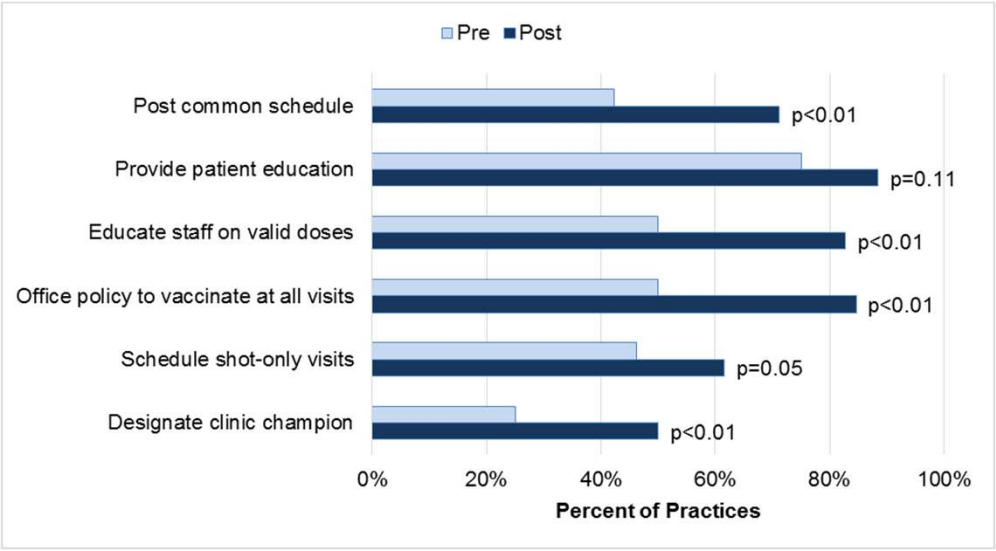




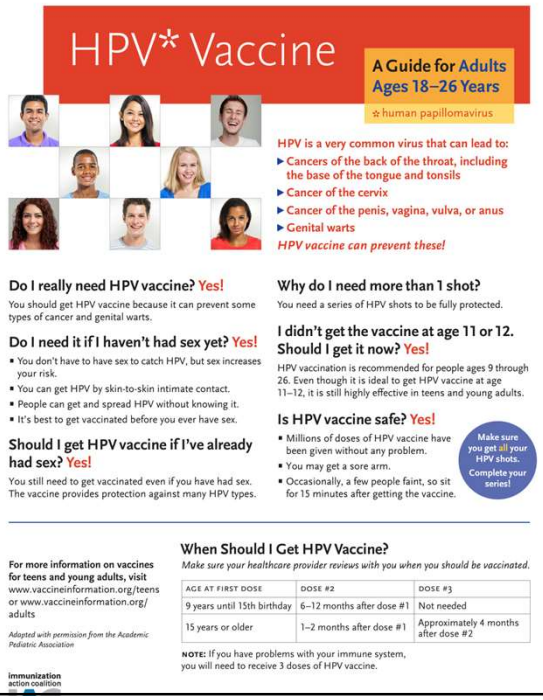
Rand CM, Schaffer SJ, Dhepyasuwan N, et al. **Provider Communication, Prompts, and Feedback to Improve HPV Vaccination Rates in Resident Clinics.** Pediatrics. 2018 Apr;141(4)

45

Strategies to Reduce MOs



46



HPV* Vaccine

A Guide for Adults Ages 18–26 Years

☆human papillomavirus

HPV is a very common virus that can lead to:

- Cancers of the back of the throat, including the base of the tongue and tonsils
- Cancer of the cervix
- Cancer of the penis, vagina, vulva, or anus
- Genital warts

HPV vaccine can prevent these!

Do I really need HPV vaccine? Yes!

You should get HPV vaccine because it can prevent some types of cancer and genital warts.

Do I need it if I haven't had sex yet? Yes!

- You don't have to have sex to catch HPV, but sex increases your risk.
- You can get HPV by skin-to-skin intimate contact.
- People can get and spread HPV without knowing it.
- It's best to get vaccinated before you ever have sex.

Should I get HPV vaccine if I've already had sex? Yes!

You still need to get vaccinated even if you have had sex. The vaccine provides protection against many HPV types.

Why do I need more than 1 shot?

You need a series of HPV shots to be fully protected.

I didn't get the vaccine at age 11 or 12. Should I get it now? Yes!

HPV vaccination is recommended for people ages 9 through 26. Even though it is ideal to get HPV vaccine at age 11–12, it is still highly effective in teens and young adults.

Is HPV vaccine safe? Yes!

- Millions of doses of HPV vaccine have been given without any problem.
- You may get a sore arm.
- Occasionally, a few people faint, so sit for 15 minutes after getting the vaccine.

Make sure you get all your HPV shots. Complete your series!

For more information on vaccines for teens and young adults, visit www.vaccineinformation.org/teens or www.vaccineinformation.org/adults

Adapted with permission from the Academic Pediatric Association

immunization action coalition

When Should I Get HPV Vaccine?

Make sure your healthcare provider reviews with you when you should be vaccinated.

AGE AT FIRST DOSE	DOSE #2	DOSE #3
9 years until 15th birthday	6–12 months after dose #1	Not needed
15 years or older	1–2 months after dose #1	Approximately 4 months after dose #2

NOTE: If you have problems with your immune system, you will need to receive 3 doses of HPV vaccine.

https://www.immunize.org/catg.d/p4251.pdf

47

For More Information

- CDC: https://www.cdc.gov/hpv/index.html
- Immunization Action Coalition: http://www.immunize.org/
- ACS: https://www.cancer.org/healthy/hpv-vaccine.html
- National HPV Vaccine Roundtable: https://hpvroundtable.org/
- NYS HPV Vaccine Coalition: https://www.nyshpv.org/

HPV VACCINE IS CANCER PREVENTION

48

Thank you!
Questions?

49