

Human Papillomavirus Disease and Vaccine Update

Orange County Immunization Coalition

May, 2021

HPV INFECTION IS COMMON



80%

of people will get an HPV
infection in their lifetime

Most HPV infections will go away on their own. Infections that don't go away can cause precancers and cancers.

HPV vaccination is the best protection against 6 types of cancer.

Cervical Cancer Just the tip of the iceberg.

Cervical cancer is the only type of cancer caused by HPV that has a recommended screening test to detect it at an early stage.

Estimated U.S. Cases Every Year^{1,2}

11,000

Cervical Precancers

While screening can detect precancers before they turn into cancer, treatment for these precancers can lead to **problems during pregnancy.**

196,000

5 Other Cancers Caused by HPV

There are no recommended screening tests for these 5 cancers, so they may not be detected until they cause **serious health problems.**

HPV vaccination at ages 11-12 could

PREVENT OVER 90%

of these cancers.

14,000

Back of the throat

6,500

Anus

2,800

Vulva

900

Penis

700

Vagina

Sources:

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

2. <https://www.cdc.gov/mmwr/volumes/68/wr/mm6815a1.htm>

For additional information, visit:
www.cdc.gov/HPV



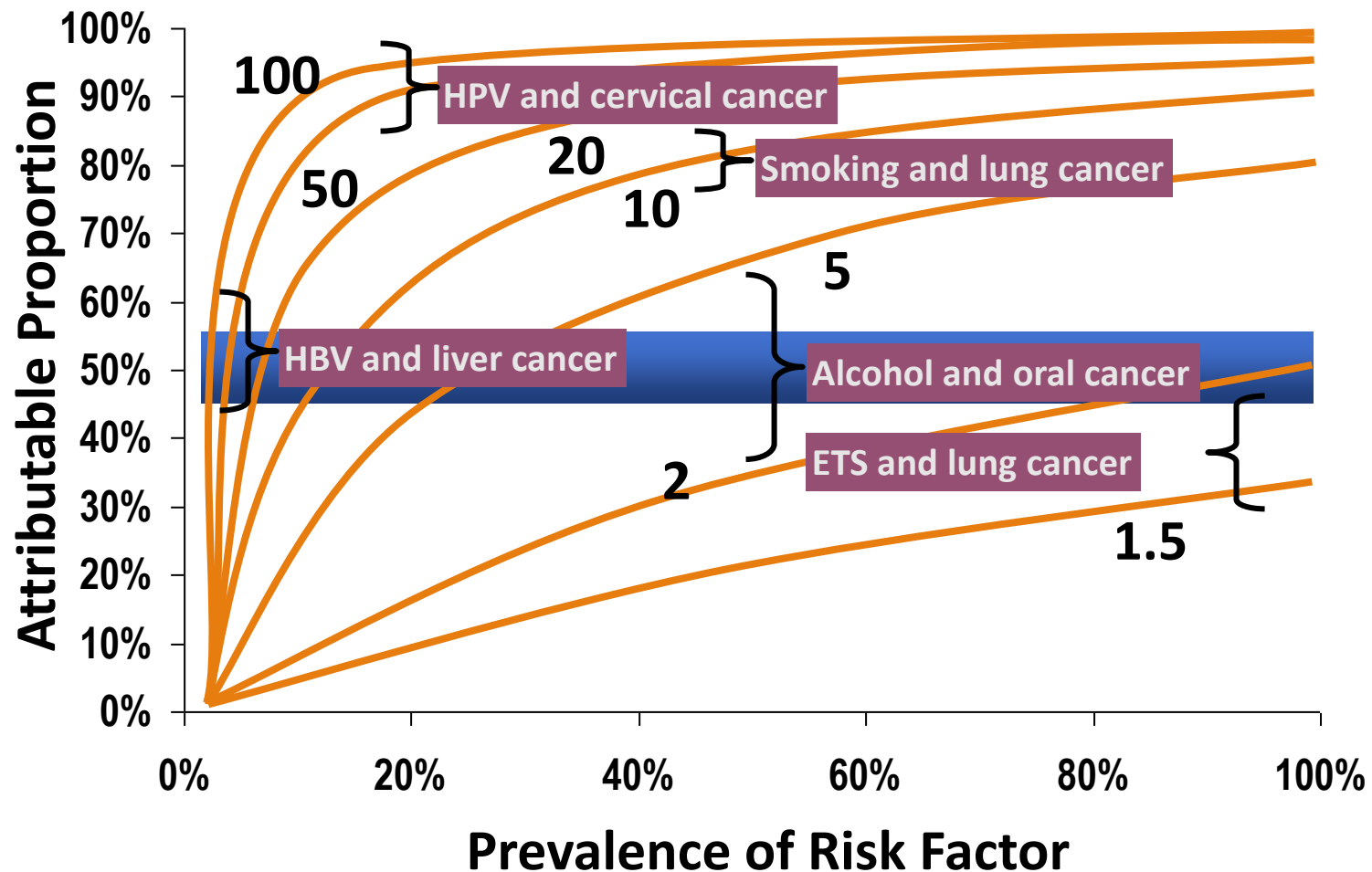
HPV VACCINE IS CANCER PREVENTION

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PN300538

HPV and Cervical Cancer

- Each year in the United States:
 - Nearly 200,000 women are estimated to be diagnosed with a cervical precancer
 - 11,000 cases of cervical cancer diagnosed
 - 4,000 women die of cervical cancer
- HPV infection precedes over 90% of cervical cancer cases

Projected Attributable Proportions of Prevention Targets in Cancer Control¹



*ETS = Environmental tobacco smoke (passive smoking)

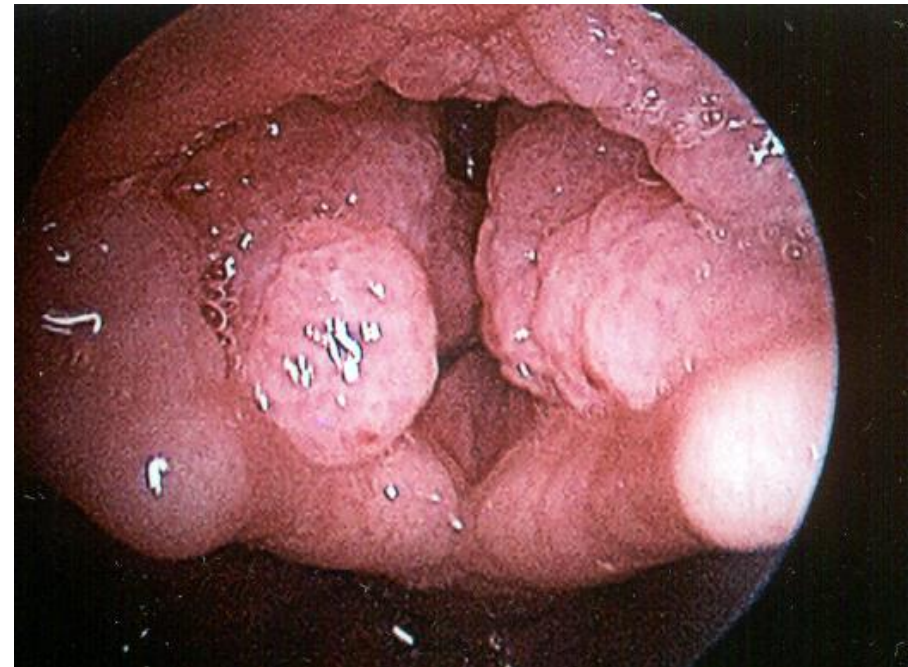
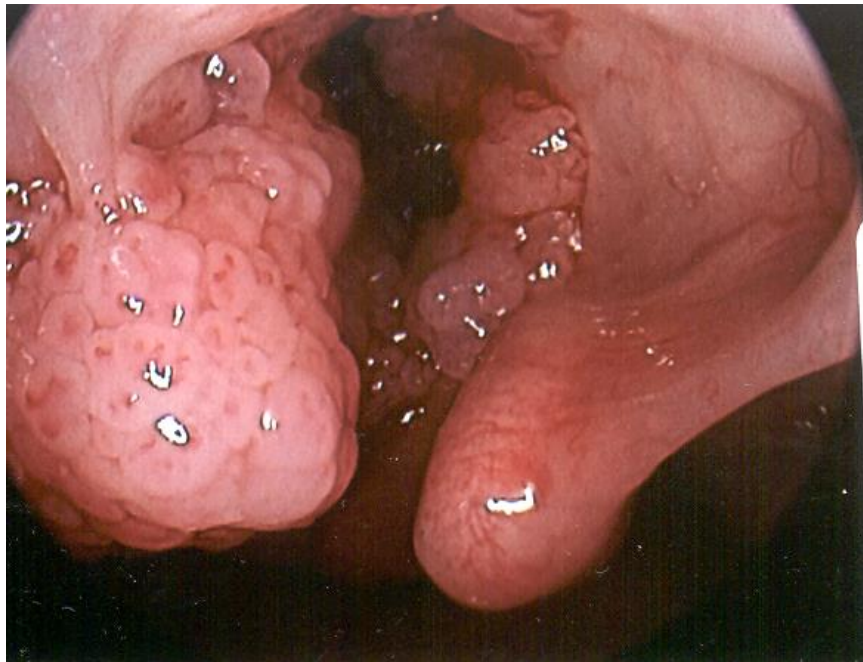
1. Franco EL, Harper DM. *Vaccine*. 2005;23:2388–2394.

Annual HPV-Related Cancer Burden in U.S. Men

Cancer Type	Estimated number probably caused by any HPV strains	Estimated % caused by any HPV strains
Anus	2100	91
Penis	900	63
Oropharyngeal	11800	70

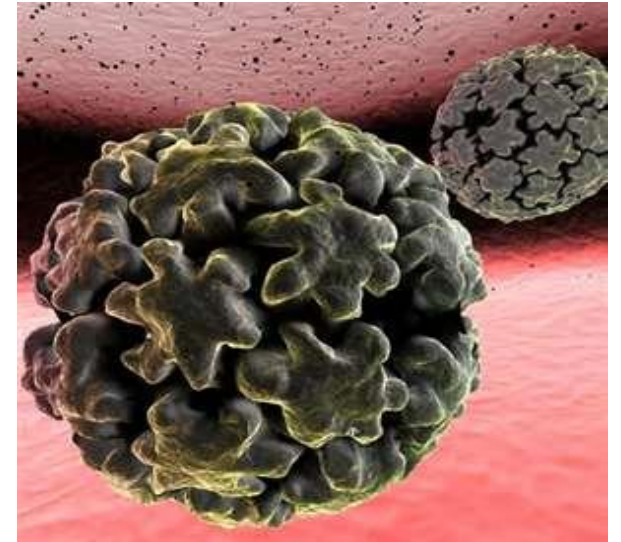
<https://www.cdc.gov/cancer/hpv/statistics/cases.htm>

Pediatric Recurrent Respiratory Papillomatosis



HPV 9-Valent Vaccine

- Inactivated
- Recombinant
- Prepared from Virus-Like Particles (VLP) of the major capsid protein
- Contains aluminum-containing adjuvant
- Humoral responses to VLP mediate immunity
- Protects against HPV strains 6, 11, 16, 18, 31, 33, 45, 52, and 58
- Recommended in US for females in 2006 and for males in 2011



HPV Immunization Recommendations

- Routine immunization at age 11-12 years for all
- Catch up for all Females aged 13-26 years
- Catch up for all Males aged 13-26 years
- Men who have sex with men aged 13-26 years

ACIP June 2019 meeting:

- A recommendation for individual clinical decision making for persons aged 27 through 45 years

HPV Dosing Schedules

- Two doses are recommended for persons starting the series before their 15th birthday.
 - The second dose of HPV vaccine should be given 6 to 12 months after the first dose.
- Three doses recommended for those starting the series at ages 15 through 26 years, and for immunocompromised persons.
 - The recommended three-dose schedule is 0, 1–2 and 6 months.

Human Papillomavirus Vaccine-Type Infection Rates Among U.S. Females Continue to Decline

- Review of cervicovaginal swab data results from the National Health and Nutrition Examination Survey (NHANES) found:
- HPV vaccine-type (4vHPV-type) prevalence declined steeply among females from 2003–2006 to 2015–2018
- Decreases were seen in vaccinated and unvaccinated females, indicating herd immunity
- 88% drop in 4vHPV-type 14-19 year olds
- Among sexually experienced 14-19 yo females:
 - 97% decrease among those vaccinated
 - 87% decrease among those unvaccinated
- 81% drop in prevalence of 4vHPV-type among 20-24 year olds

Reference: Declines in Prevalence of HPV-type Infection Among Females after Introduction of Vaccine-US, 2003-18. MMWR March 26, 2021/ Vol.70/ No. 12

Findings from a 2019 Meta-analysis of Studies of HPV Vaccine Effectiveness:

- A multi-country study found that 5-8 years after HPV vaccination:
- Prevalence of HPV 16 and 18 decreased by:
 - 83% (RR 0.17, 95% CI 0.11–0.25) among girls aged 13–19 years
 - 66% (RR 0.34, 95% CI 0.23–0.49) among women aged 20–24 years
- Prevalence of HPV 31, 33, and 45 decreased by 54% (RR 0.46, 95% CI 0.33–0.66) among girls aged 13–19 years.

Drolet M et al. Population-level impact and herd effects following the introduction of human papillomavirus vaccination programmes: updated systematic review and meta-analysis. *Lancet* 2019 Aug 10;394(10197):497-509.

A National Review of Invasive Cervical Cancer Rates in Sweden Found a Substantially Reduced Risk for HPV-Vaccinated Women

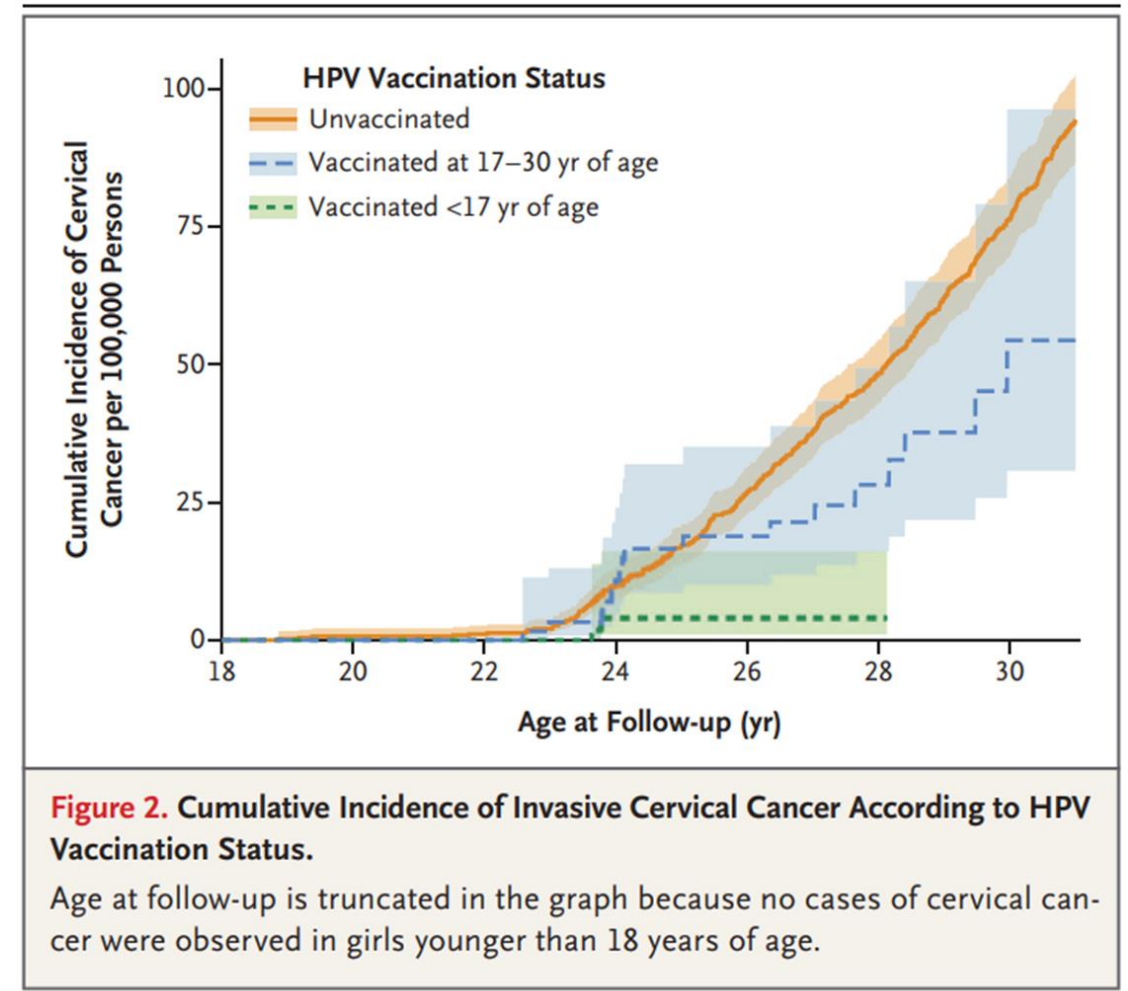
- Swedish survey of nationwide demographic and health registers
- From 2006 through 2017, followed 1,672,983 girls and women
 - Ages ranged from 10 to 30 years
- Assessed the association between HPV vaccination and the risk of invasive cervical cancer
- Cervical cancer was diagnosed in:
 - 19 women who had received quadrivalent HPV vaccine
 - 538 women who had not received the vaccine

Jiayao Lei, et al. HPV Vaccination and the Risk of Invasive Cervical Cancer. NEJM 383;14 October 1, 2020

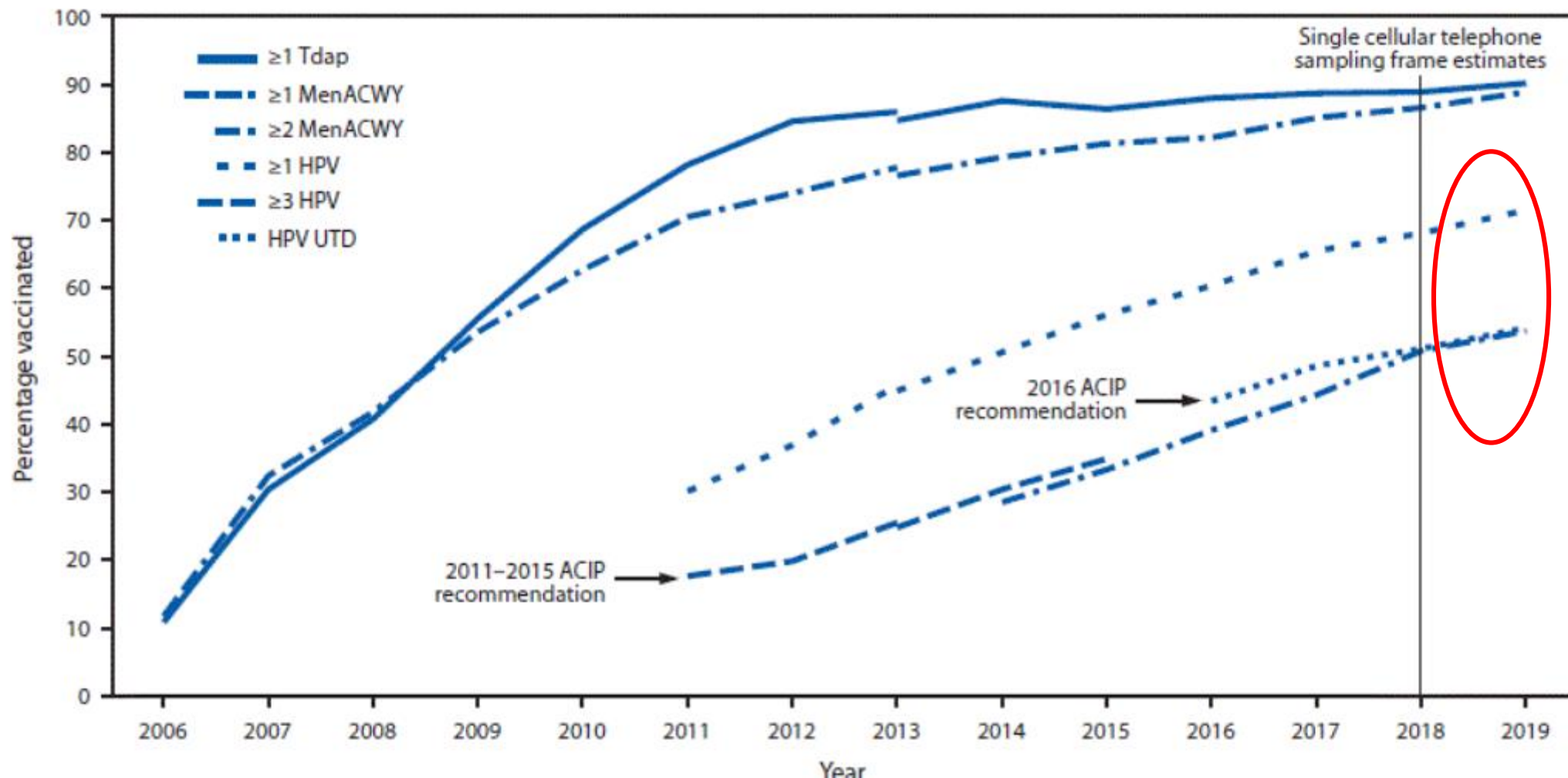
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Vaccination Age	Incidence Rate Ratio
Vaccinated Before 17 years	0.12 (95% CI, 0.00 to 0.34)
Vaccinated at 17-30 years	0.47 (95% CI, 0.27 to 0.75)

Jiayao Lei, et al. HPV Vaccination and the Risk of Invasive Cervical Cancer. NEJM 383;14 October 1, 2020



BUT Adolescent HPV Immunization Rates are Still Too Low!



Estimated vaccination coverage among adolescents aged 13–17 years, National Immunization Survey-Teen (NIS-Teen)^{9,11} — United States, 2006–2019

Potential future HPV immunization recommendations

- Emphasis on getting 11 year olds immunized
- Possible encouragement from AAP to immunize starting at age 9 years:
 - We know the vaccine is more immunogenic.
 - Would this help with completing the series? Younger kids are more likely to still be coming in for yearly check-ups.
 - Potentially less discussion about HPV as an STI at this age, more discussion about HPV vaccine being an anti-cancer vaccine
 - MCV4 and Tdap still at 11-12y