HPV vaccination is cancer prevention

DON'T WAIT TO VACCINATE

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1/21/16

YOU ARE THE KEY TO CANCER PREVENTION

Presenter Disclosure Information
Rebecca Perkins

- I, Rebecca Perkins, have been asked to disclose any significant relationships with commercial entities that are either providing financial support for this program or whose products or services are mentioned during my presentations.
  - I have no relationships to disclose.
- I may discuss the use of vaccines in a manner not approved by the U.S. Food and Drug Administration.
  - But in accordance with ACIP recommendations.

I want to convince you:

1. **HPV vaccination is worth your *passionate* advocacy.**
2. **HPV vaccine is worth giving long *before exposure*.**
3. **Your recommendation can make all the difference to the family's acceptance.**

The learner should be able to:

1. Explain the importance of HPV vaccination & rates.
2. Discuss the rationale for vaccinating at ages 11 or 12 and including males
3. Provide useful & compelling communication strategies and practical tips to inform parents about HPV

Today you will learn

- HPV infection is more common than you thought, and most of your patients will be exposed
- HPV vaccination works very well at the recommended age of 11-12 (early vaccination is more effective than later vaccination)
- HPV vaccination is very, very safe
- More parents want this vaccine than you think
- There ARE evidence-based ways to recommend it

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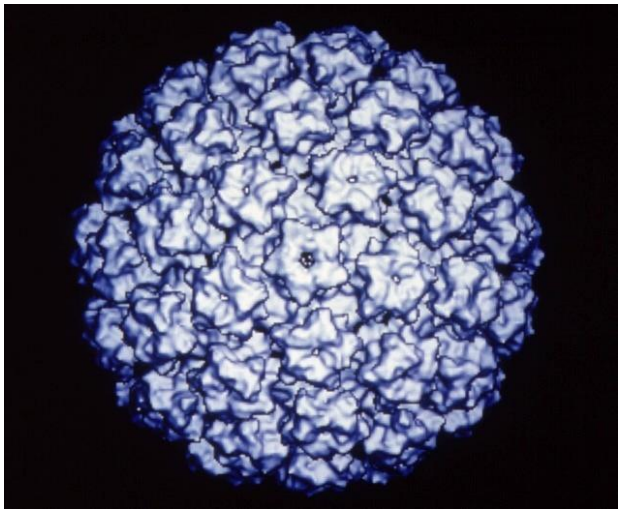
What is HPV?

- A virus that infects human skin and mucosal surfaces
- Transmitted easily by touching
- Classified as a carcinogen
- Most females and males will be infected with at least one type of mucosal HPV at some point in their lives



HPV

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What is the morbidity from HPV?

- 3 million Americans seek medical care for HPV each year
- 27,000 develop HPV-related cancers
- HPV currently causes as many deaths annually as measles did in the pre-vaccine era

Every year in the United States 27,000 people are diagnosed with a cancer caused by HPV

That's 1 case every 20 minutes

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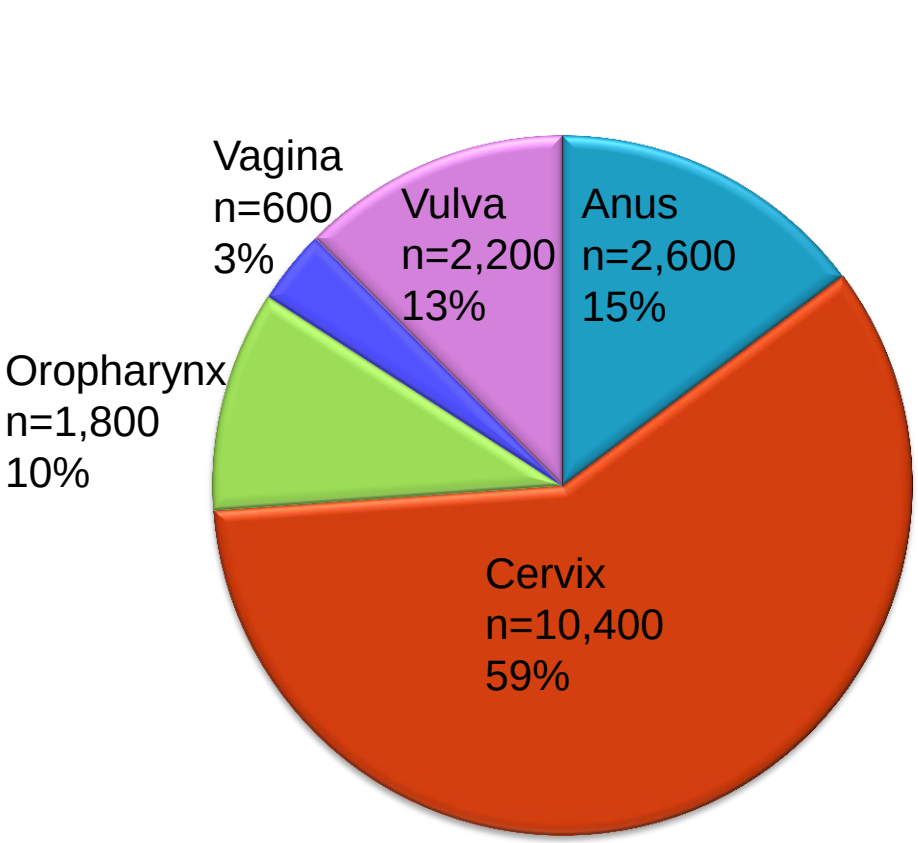
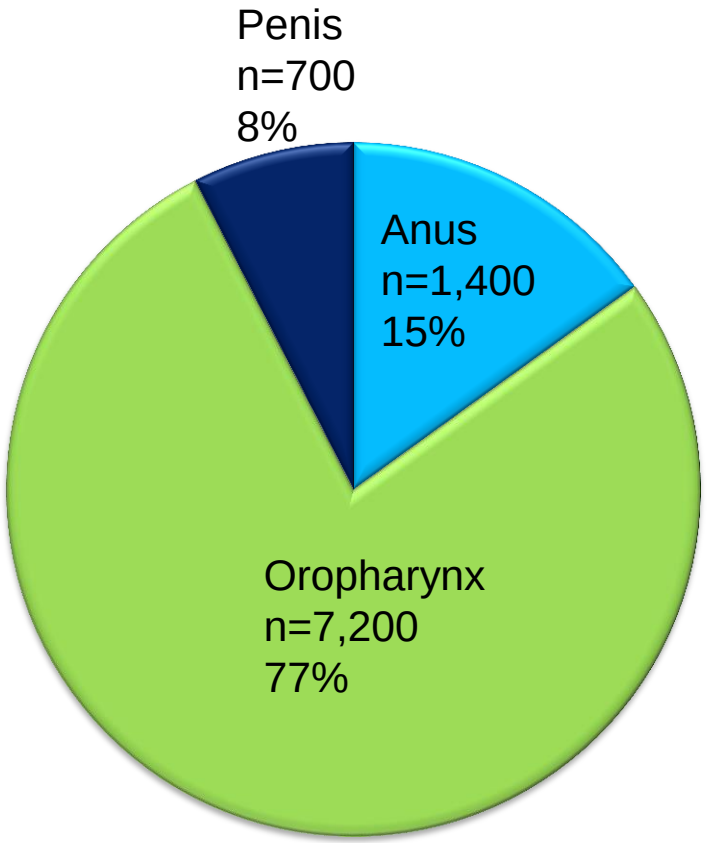
Why do we vaccinate?

- To prevent HPV infections
- To prevent HPV-associated cancers
- Because screening is not available/recommended for many HPV related cancers

Average number of new cancers probably caused by HPV, by sex, United States 2006-2010



Women (n = 17,600)



Men (n = 9,300)

CDC, United States Cancer Statistics (USCS), 2006-2010

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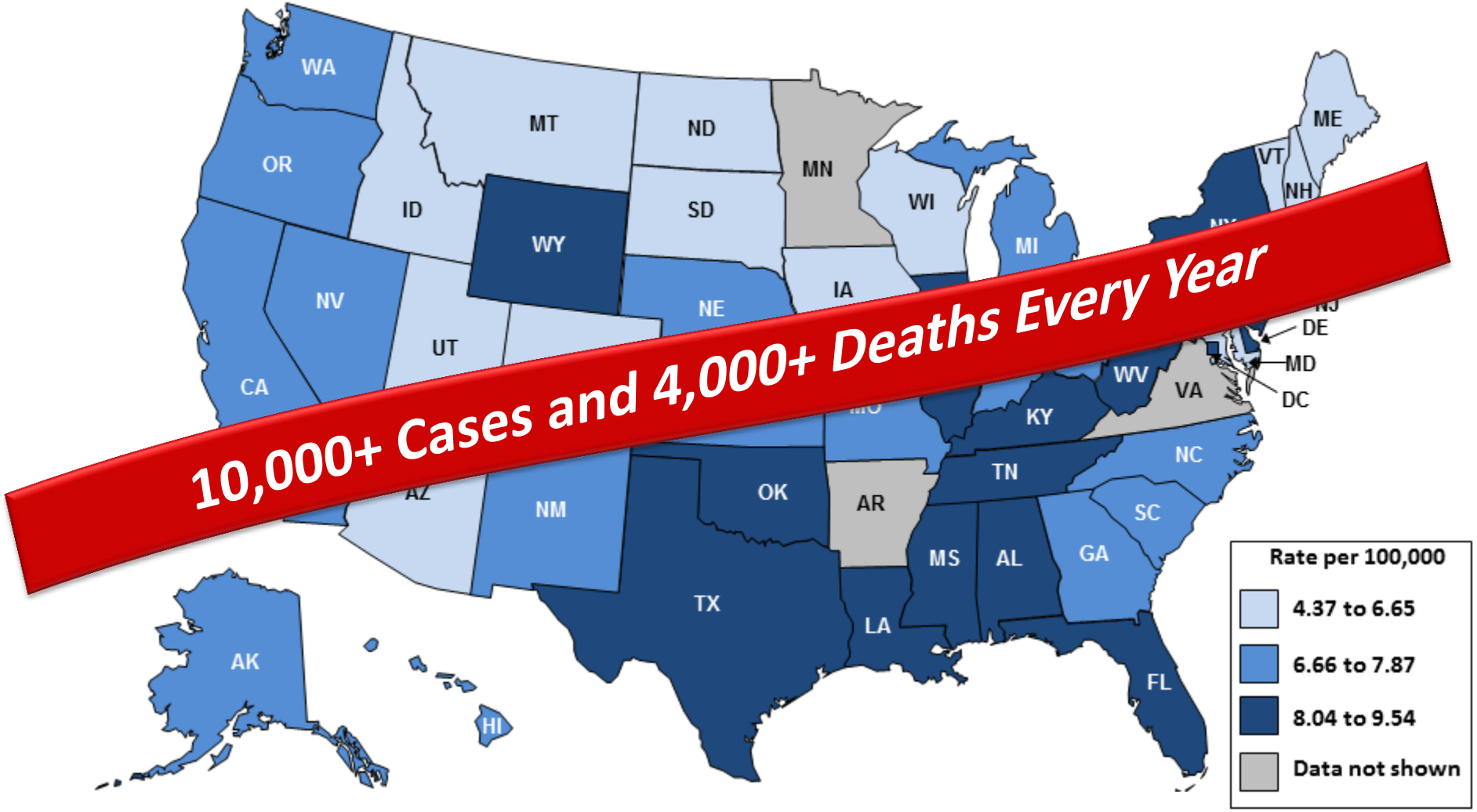
Pap history in women diagnosed with cervical cancer

Pap smear within 3 years of cancer diagnosis	% women diagnosed with cervical cancer
None	53%
Normal	**28%**
Abnormal with f/u	9%
Abnormal, no f/u	4%

Sung et al, Cancer 2000; 88: 2283-9

HPV-Associated Cervical Cancer Incidence Rates by State, United States, 2006-2010



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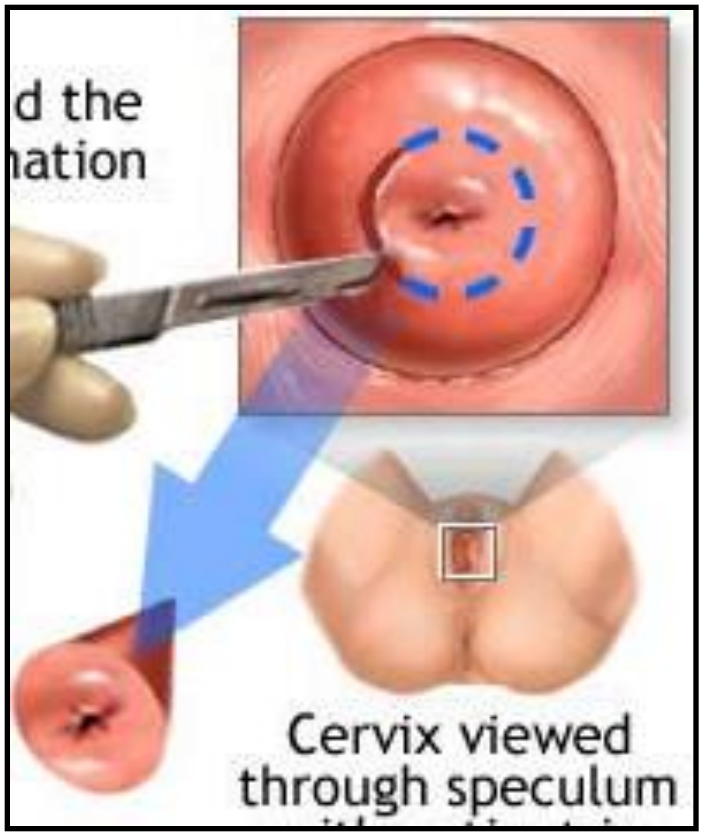
www.cdc.gov/cancer/npcr

Treatment of cervical precancerous lesions can lead to increased risk of preterm delivery

- **330,000 women undergo cone/ LEEP procedures every year**
- **LEEP/HPV infection associated with obstetric morbidity**
  - Preterm delivery
  - Preterm rupture of membranes
  - Low birth weight
  - *Long term developmental outcomes, neonatal intensive care costs*



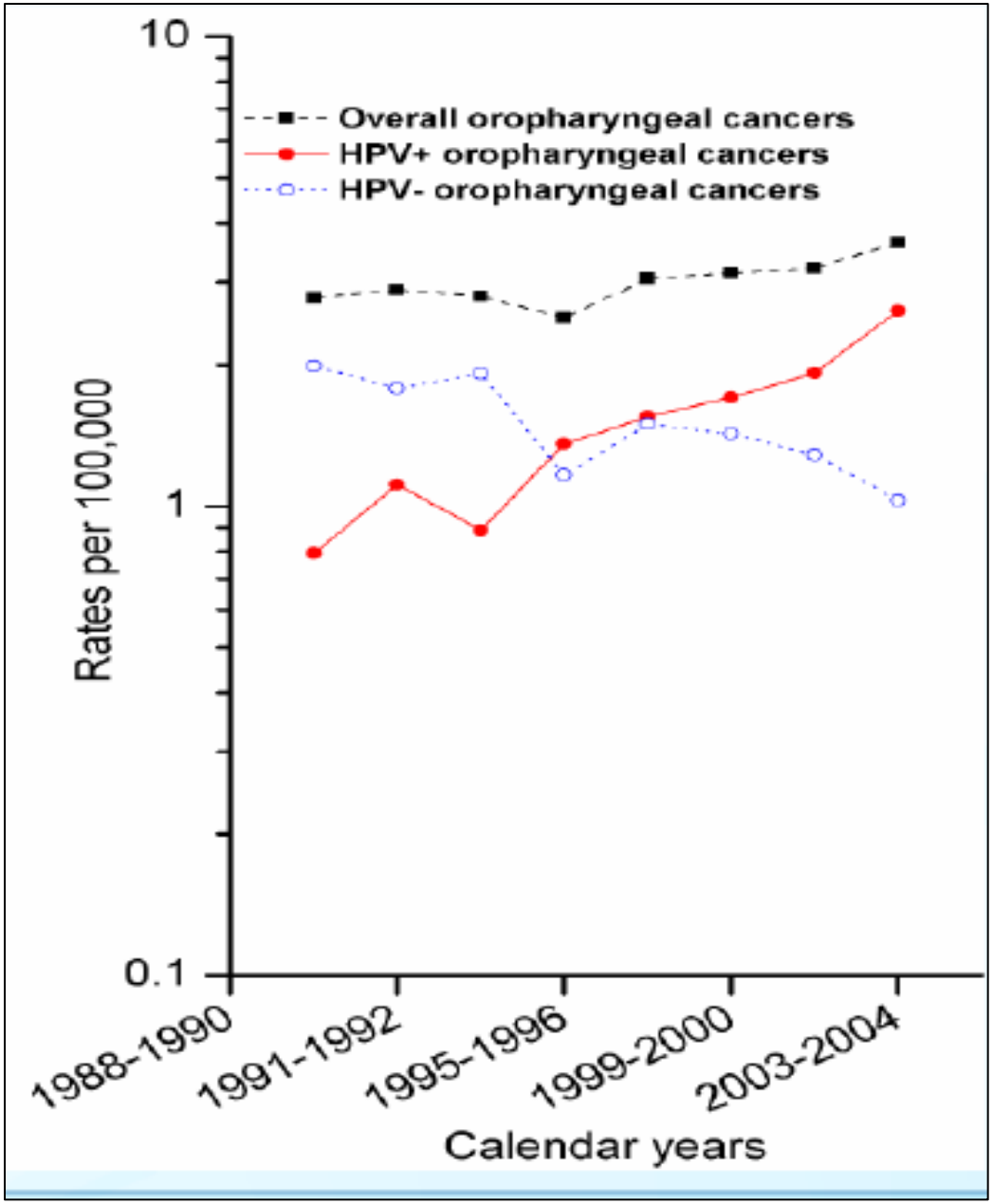
Why do we want to protect boys from HPV?

- Oropharyngeal cancers more common in men
  - No screening test for oropharyngeal cancers
- Genital warts
- Anal cancer
- Penile cancer

The incidence of oropharyngeal cancers increased in the past 20 years

During this time:

- Smoking and alcohol-related cancers decreased 50%
- HPV-related cancers increased by 225%



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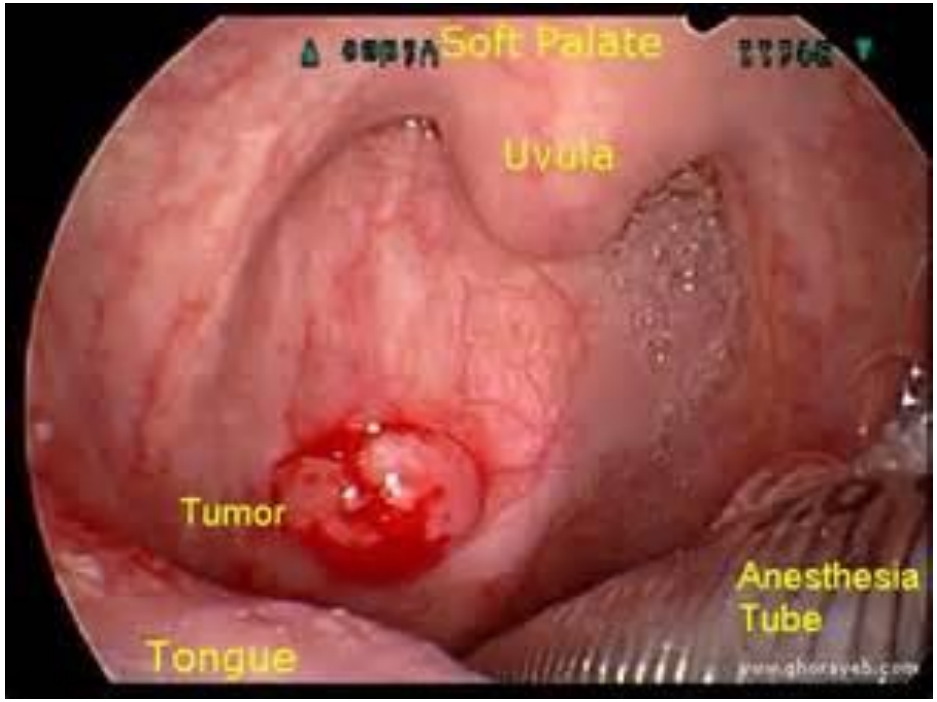
Oropharyngeal Cancer

11,000 cases annually, 7,000 in men

Will be more common than cervical cancer by 2020

Rise in incidence and changing patient demographics due to HPV



http://www.ghorayeb.com/OropharyngealCarcinoma.html

RISK OF HPV ACQUISITION

Almost everyone will be exposed to HPV

Many infections will clear on their own, others may persist and some will reactivate decades after initial exposure

HPV transmission

- **Most females and males will be infected with at least one type of mucosal HPV at some point in their lives**
- **Most common route is sexual intercourse**
  - **genital-genital, anal-genital, oral-genital, manual-genital**
- **Nearly 50% of high school students have already engaged in sexual (vaginal-penile) intercourse**
  - 1/3 of 9th graders and 2/3 of 12th graders have engaged in sexual intercourse
  - 24% of high school seniors have had sexual intercourse with 4 or more partners

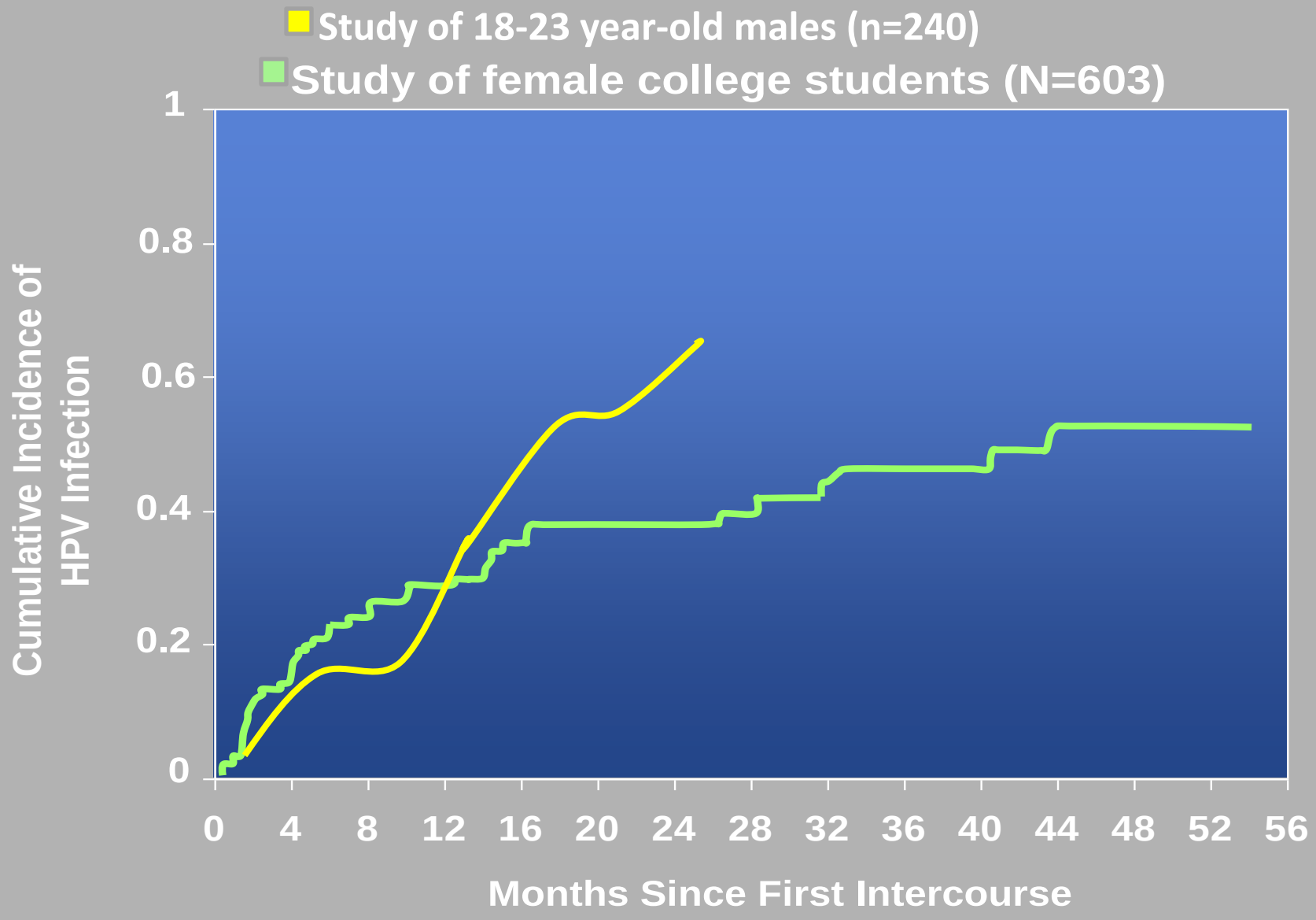
Jemal A et al. J Natl Cancer Inst 2013;105:175-201

HPV can be transmitted without "having sex"

- Study examined the frequency of vaginal HPV and the association with non-coital sexual behavior in longitudinally followed cohort of adolescent women without prior vaginal intercourse
- HPV has been detected in women prior to first vaginal sex. The percentage ranges from 9 to 46%, depending on the study.
- 70% of these women reported non-coital behaviors that may in part explain genital transmission

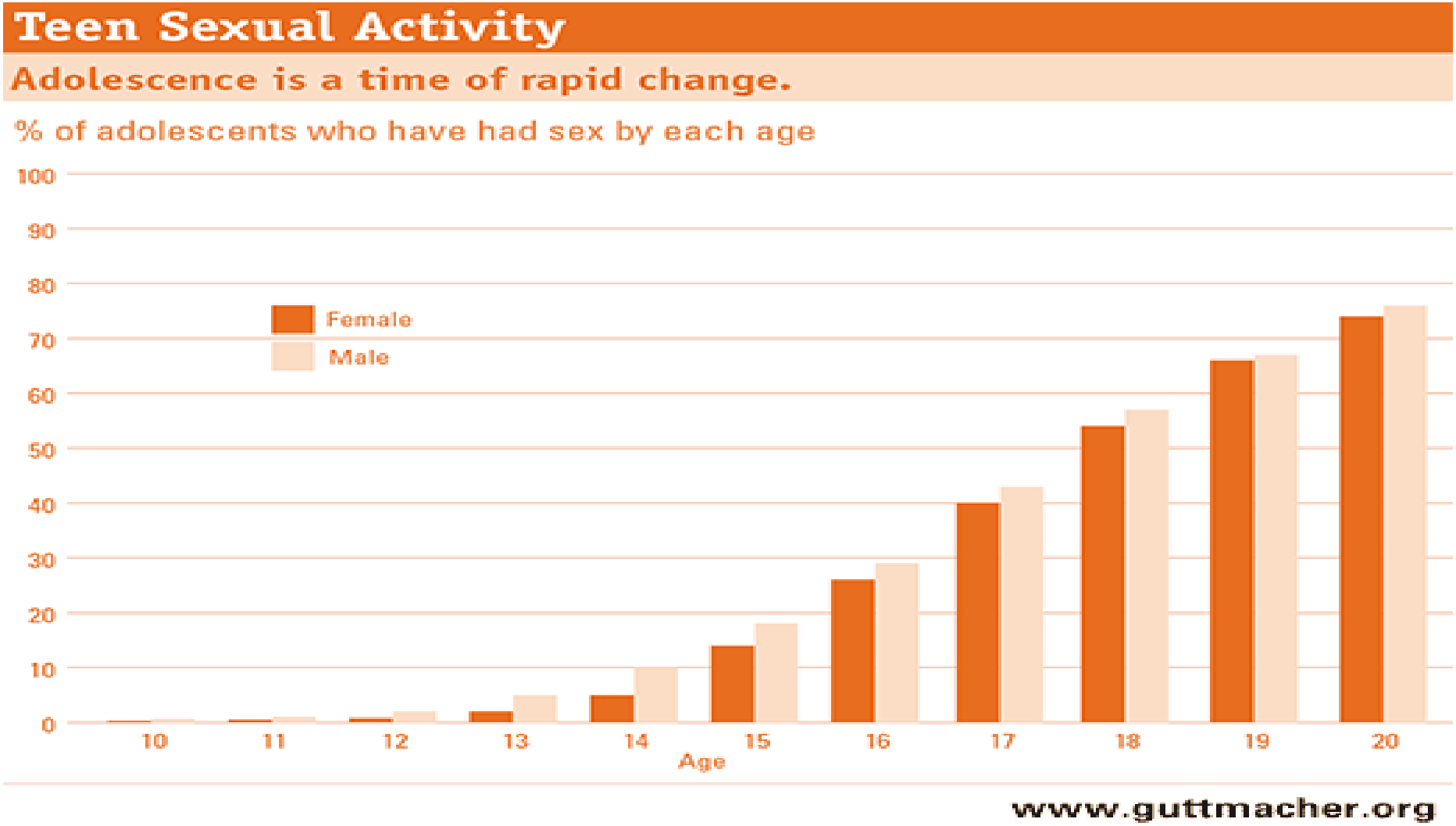
Shew, J Infect Dis. 2012

Rapid acquisition of HPV following sexual debut



From Winer RL, Lee S-K, Hughes JP, Adam DE, Kiviat NB, Koutsky LA. Genital human papillomavirus infection: incidence and risk factors in a cohort of female university students. *Am J Epidemiol.* 2003;157:218–226. Reprinted with the permission of Oxford University Press. Partridge, JID 2007

Rationale for vaccinating early: Protection prior to exposure to HPV



HPV may never go away

- 700 women aged 35-60
- Only 13% of incident infections attributed to new sexual partners
- 85% of incident infections occurred during periods of abstinence or monogamy

Early vaccination can prevent initial infection

Rositch Cancer Res 2012

Recommendations, Safety, Impact, & Coverage Rates

HPV VACCINE

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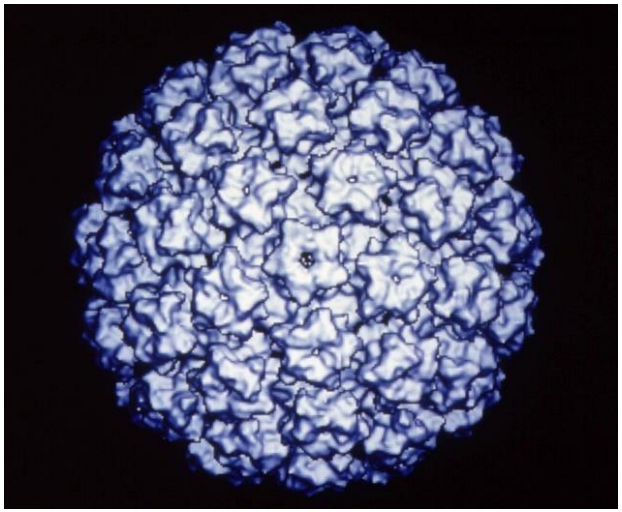
HPV prophylactic vaccines

- 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

Updated ACIP Recommendations

- **Routine vaccination at age 11 or 12 years***
- Vaccination recommended through **age 26 for females** and through **age 21 for males** not previously vaccinated
  - Note HPV-9 is now FDA approved for males through age 26
- Vaccination recommended for men **through age 26** who have sex with men (MSM) or are immunocompromised (including persons HIV-infected)

Formulation by gender (assuming availability)

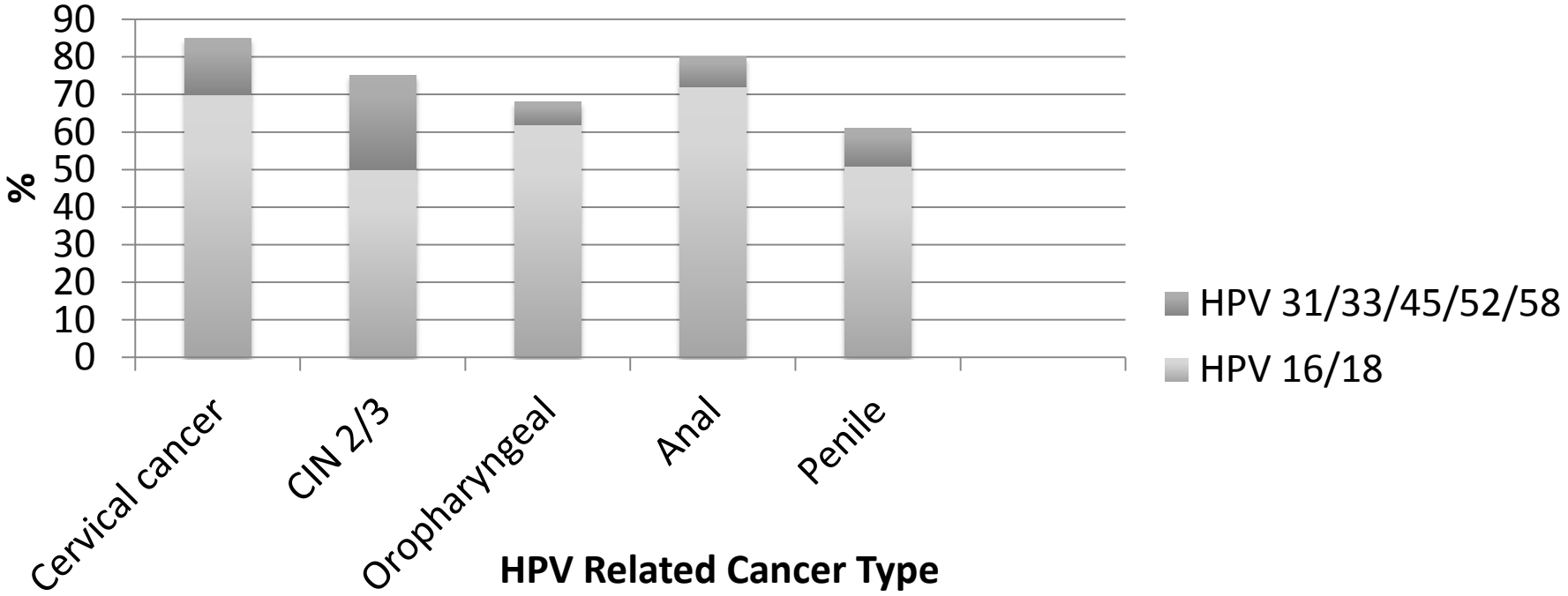
	9vHPV	4vHPV	2vHPV
Females	✔	✔	✔
Males	✔	✔	

*vaccination series can be started at 9 years of age
MMWR 2015;64:300-4

9vHPV Vaccine Safety

- **Seven pre-licensure studies including 15,000 males and females**
- **Generally well tolerated**
  - Adverse event profile similar to that of 4vHPV across age, gender, race, and ethnicity
  - More injection-site reactions expected among those who receive 9vHPV

Percentage of HPV types found in common HPV related cancers, US Data



Overall improvement in cancer prevention for 9-valent vaccine over quadrivalent and bivalent: 14% for females, 4% for males

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Updated ACIP Recommendations: Interchangeability

If vaccination providers do not know, or do not have available the HPV vaccine product previously administered, or are in settings transitioning to 9vHPV:

For protection against HPV 16 and 18,

- Females: Any HPV vaccine product may be used to continue or complete the series
- Males: 4vHPV or 9vHPV may be used to continue or complete the series

MMWR 2015;64:300-4

Clinician questions

- **Do I need to restart the series if a dose is late?**

  No, just ensure the recommended minimum intervals are met.

- **Can I vaccinate someone over age 26?**

  Vaccination is safe, but disease may not be reduced. Insurance is unlikely to reimburse.

- **How long does immunity last?**

  At least 10 years, studies are ongoing

- **Should I vaccinate after an abnormal Pap?**

  Yes, they will be protected from HPV types they don't already have.

Parents and adolescents want to know…

IS IT SAFE?
DOES IT WORK?
WILL IT CHANGE MY CHILD'S BEHAVIOR?

HPV VACCINE SAFETY

HPV Vaccination Is Safe, Effective, and Provides Lasting Protection

- **HPV Vaccine is SAFE**
  - Benefits of HPV vaccination far outweigh any potential risks
  - Safety studies findings for HPV vaccination similar to safety reviews of MCV4 and Tdap vaccination
- **HPV Vaccine WORKS**
  - Population impact against early and mid outcomes have been reported in multiple countries
- **HPV Vaccine LASTS**
  - Studies suggest that vaccine protection is long-lasting
  - No evidence of waning protection

Garland et al, Prev Med 2011; Ali et al, BMJ 2013;
Markowitz JID 2013; Nsouli-Maktabi MSMR 2013

Vaccinated girls had no more risk than unvaccinated girls of developing:

- ❑ 2011- allergic reactions, anaphylaxis, Guillain–Barré Syndrome, stroke, blood clots, appendicitis, or seizures (than unvaccinated or who received other vaccines)
- ❑ 2013 – (almost 1 million girls) blood clots or AEs related to the immune & CNS
- ❑ 2014 – (>1 million women) venous thromboembolism or blood clots
- ❑ 2012 and 2014 – (2 studies) autoimmune disorders
- ❑ 2015 – Multiple sclerosis or other demyelinating diseases
- ❑ 2015- Orthostatic or pain syndromes (POTS/CRPS)
- ❑ 2016- blood clots

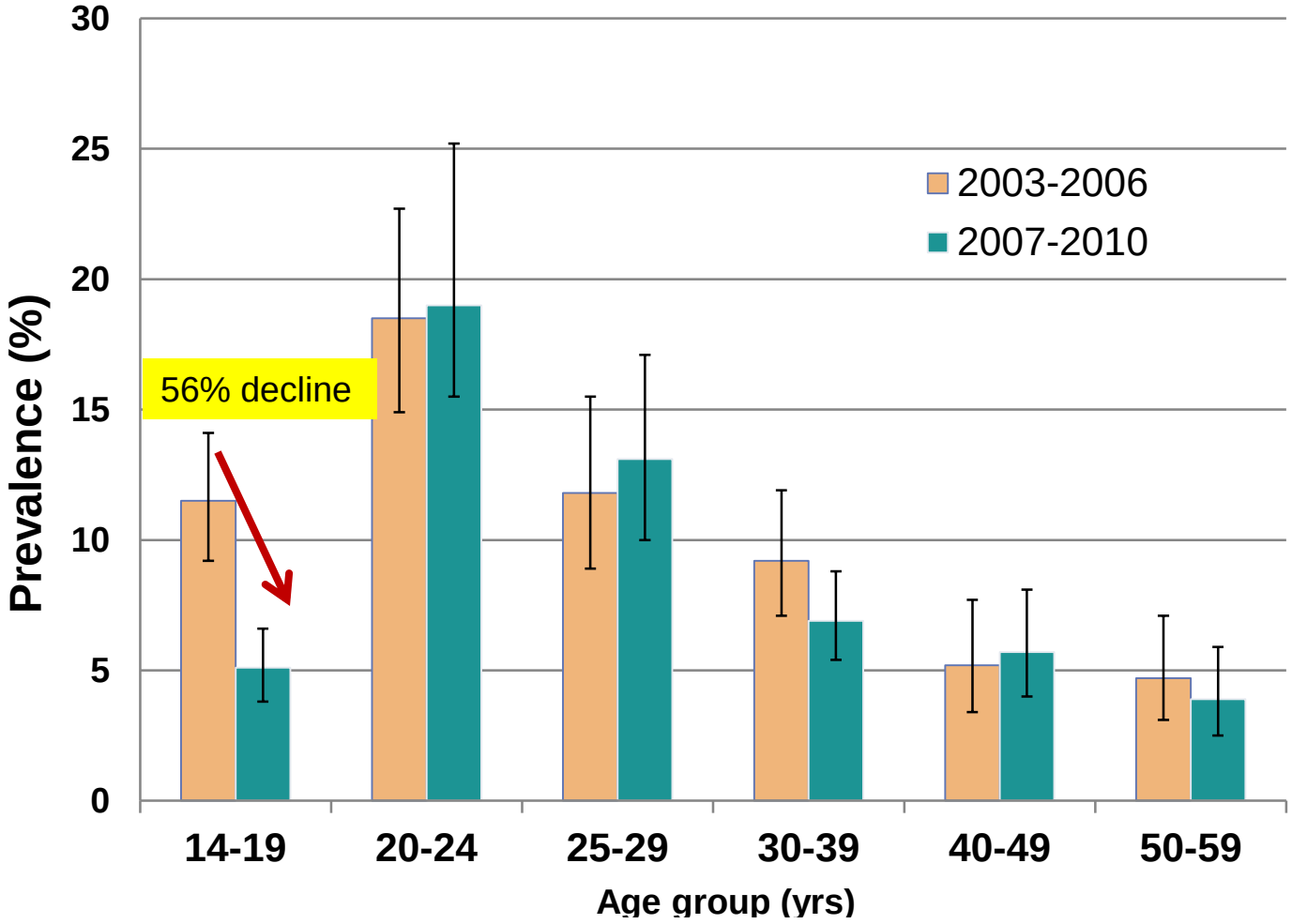
2012 - vaccine may be associated with skin infections where the shot is given and fainting, similar to other vaccines

Vichnin, An Overview of qHPV safety: 2006-2015, PIDJ, 2015

HPV VACCINE EFFECTIVENESS

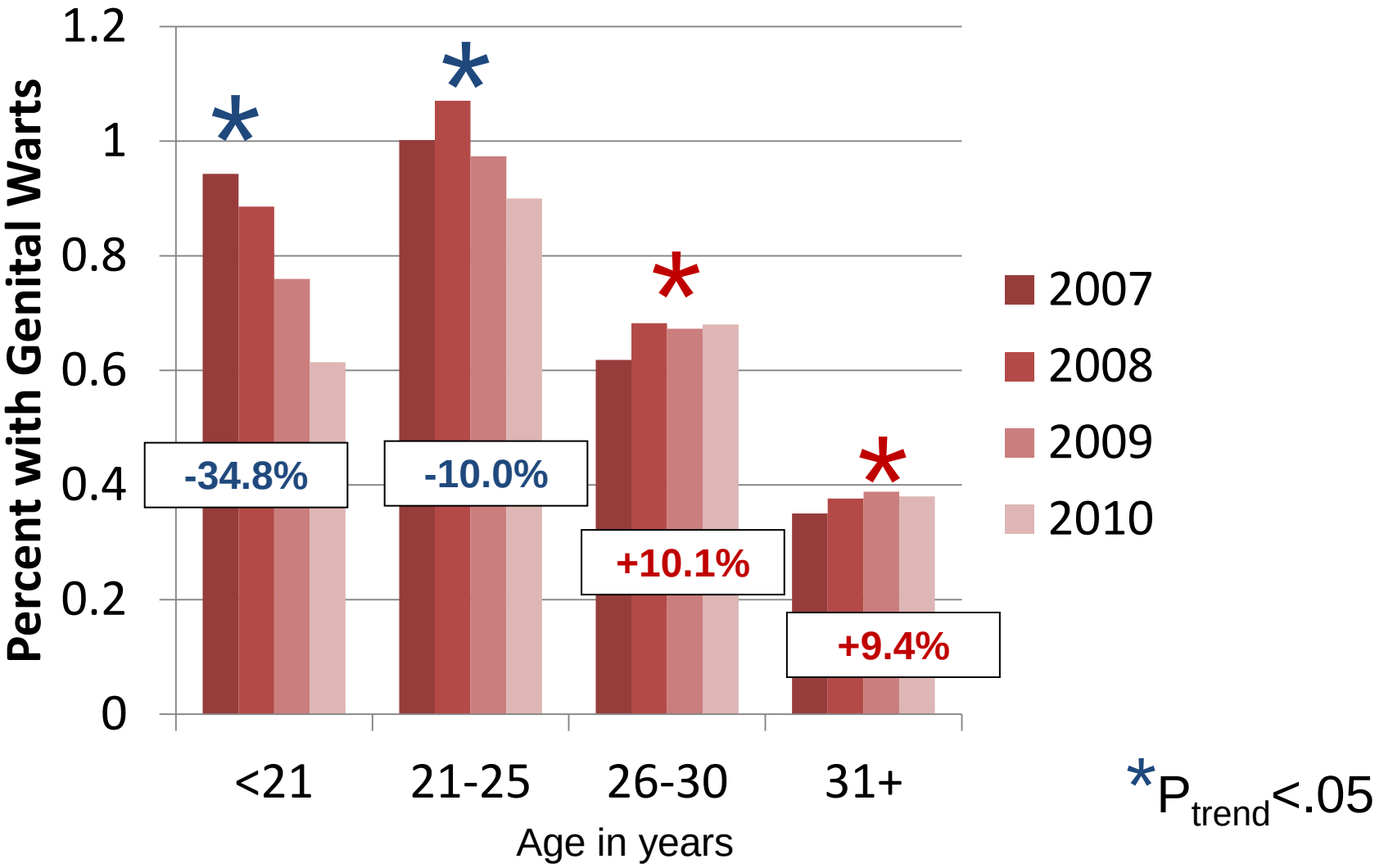
HPV vaccine impact: US

Prevalence of vaccine type HPV decreased 56%



Markowitz, et al. JID 2013 *weighted prevalence

Genital warts among females by age group, CA Family PACT 2007-2010



*P_{trend}<.05

Bauer, et al *AJPH* 2012

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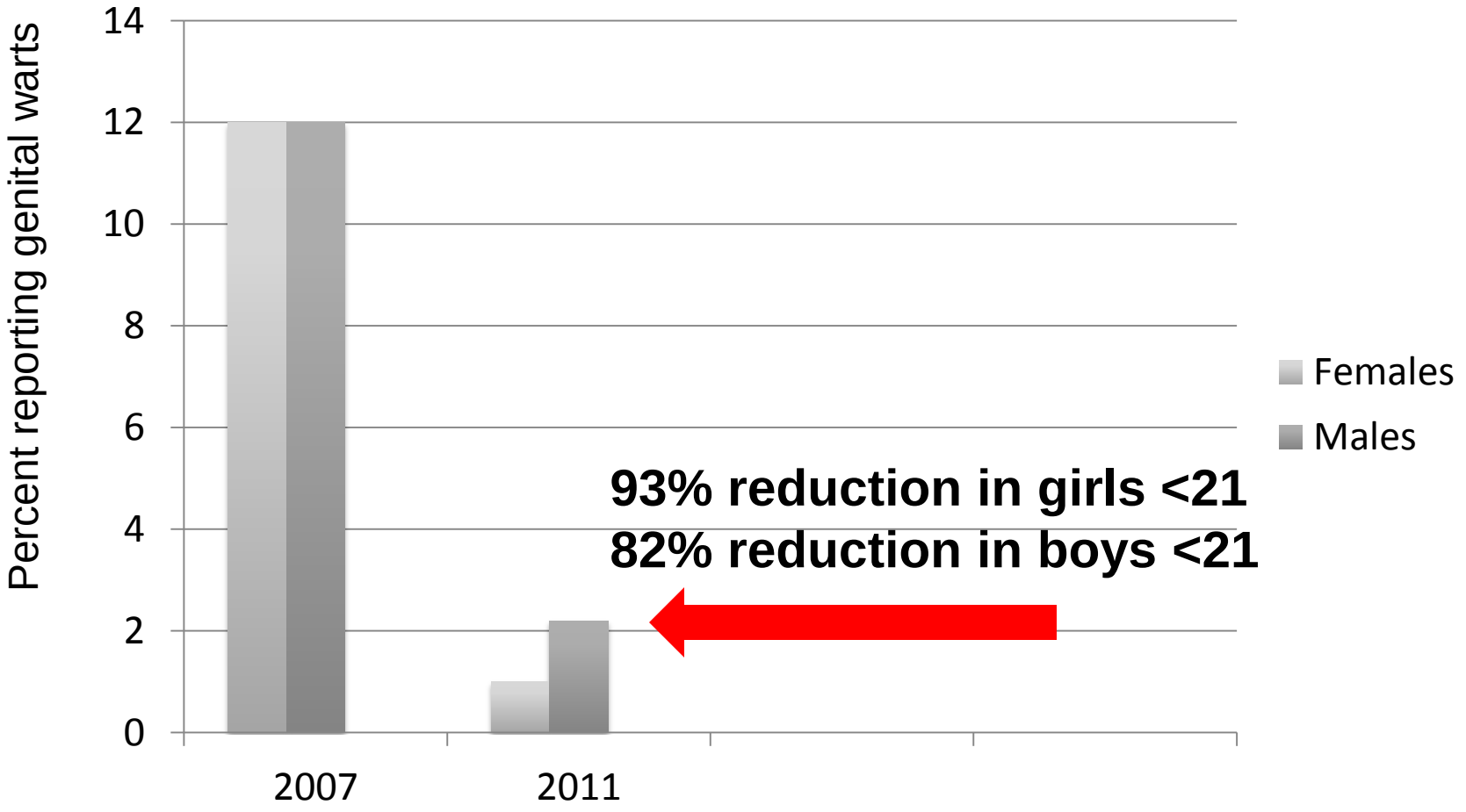
Vaccine effectiveness on preventing cervical pre-cancer in the US

- 1,662 patients aged <27 years presenting to colposcopy clinic 2007-2014
- Vaccinated women had
  - 53% lower odds of presenting with high-grade cytology
  - 36% lower odds of presenting with cervical intraepithelial neoplasia 2 or 3 or worse

Dorton, Vitonis, Feldman Ob Gyn 2015

Near-disappearance of genital warts in Australia following introduction of HPV vaccination *70% vaccination rate for females only



Ali H et al. BMJ 2013;346:bmj.f2032

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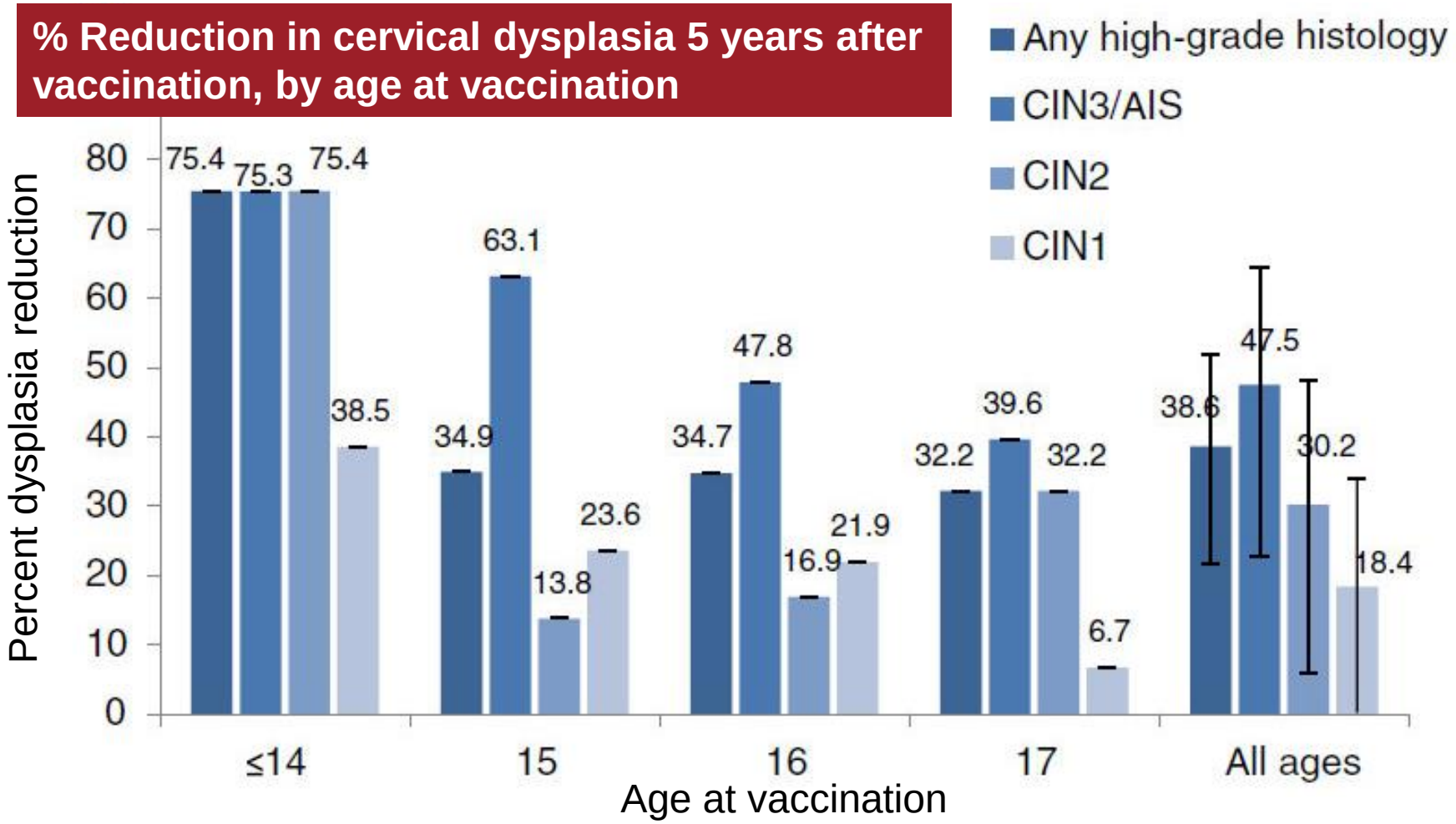
Higher effectiveness with vaccination at younger ages

% Reduction in cervical dysplasia 5 years after vaccination, by age at vaccination



Gertig DM, BMC Med 2013

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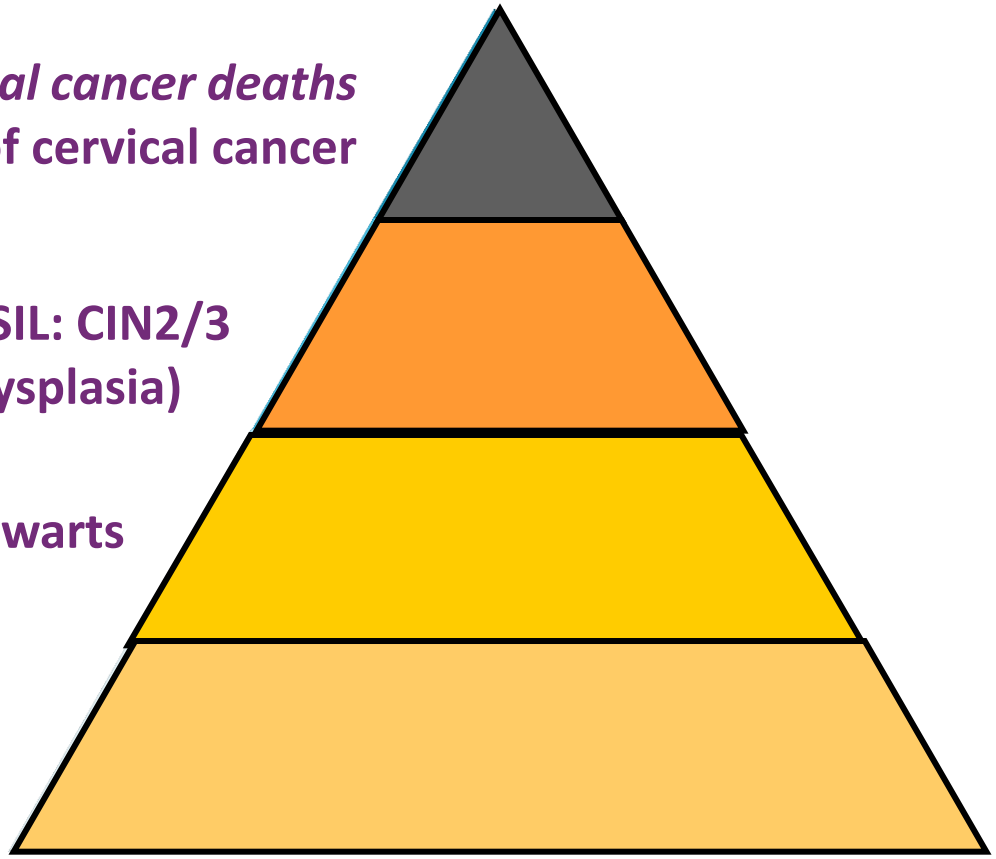
Without vaccination, annual burden of genital HPV-related disease in U.S. *females*:

4,000 cervical cancer deaths
10,846 new cases of cervical cancer

330,000 new cases of HSIL: CIN2/3 (high grade cervical dysplasia)

1 million new cases of genital warts

1.4 million new cases of LSIL: CIN1 (low grade cervical dysplasia)



3 million cases and $7 billion

American Cancer Society. 2008; *Sex Transm Dis*. 2004; Schiffman *Arch Pathol Lab Med*. 2003; Koshiol Insinga, Pharmacoeconomics, 2005

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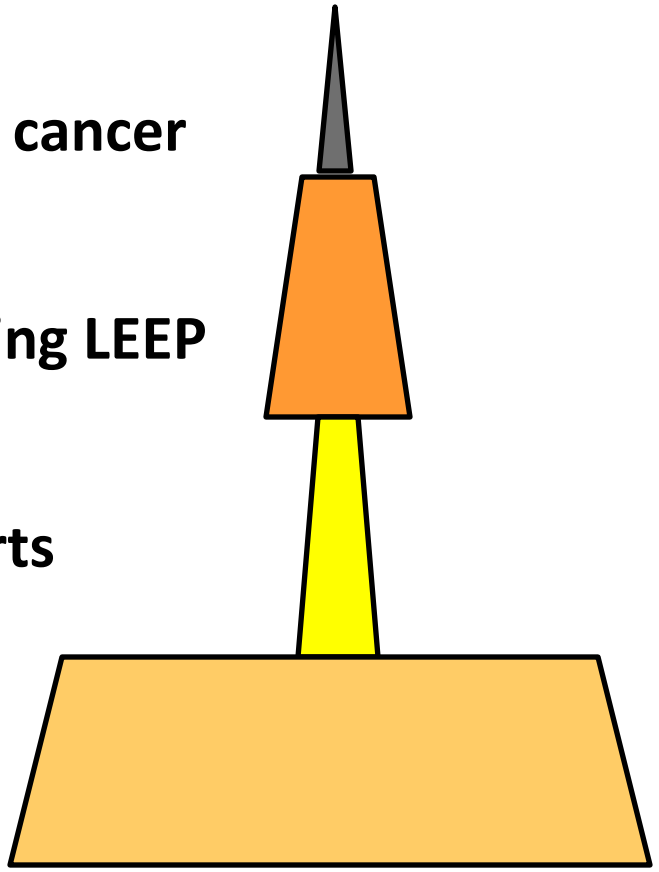
Extrapolating the prior pyramid with projections of vaccine efficacy based on Australian data



Gertig, D. M., J. M. Brotherton, et al. (2013). "Impact of a population-based HPV vaccination program on cervical abnormalities: a data linkage study " BMC Med 11: 227.

Impact of HPV vaccine on oral HPV infection

7,466 women 18-25 years of age randomized to receive HPV or hepatitis A (control) vaccine

- **5,840 gave oral specimens at the end of the 4-year study**

  - **Control vaccine group: 15 HPV 16/18 infections**
  - **HPV vaccine group: 1 HPV 16/18 infections**

Estimated vaccine efficacy against oral HPV infection: 93.3%

Herrero R, et al. Reduced prevalence of oral human papillomavirus (HPV) 4 years after bivalent HPV vaccination in a randomized clinical trial in Costa Rica. PLOS ONE 2013;8:e68329

In summary:

HPV exposure is ubiquitous

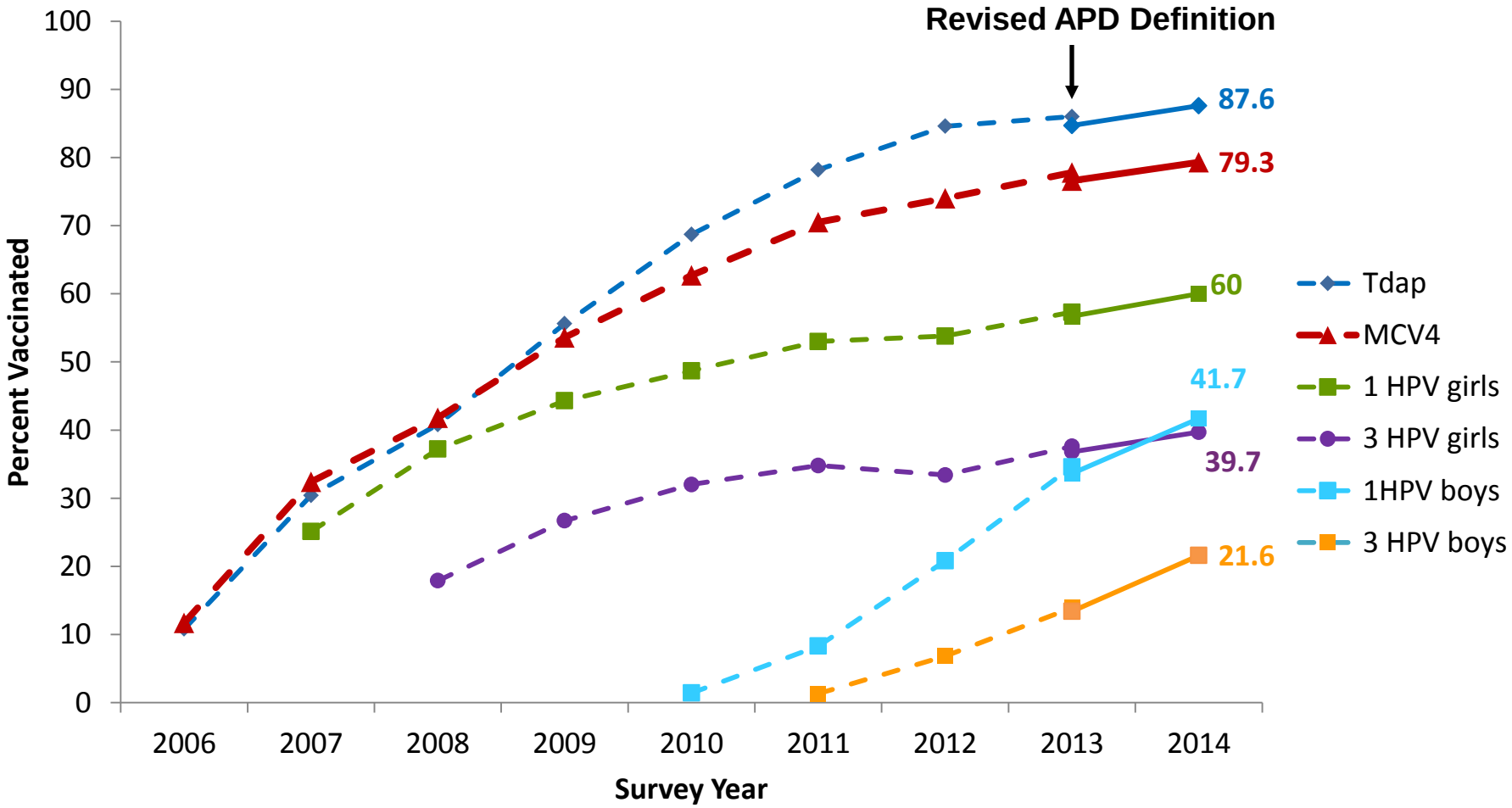
HPV causes many cancers

HPV vaccine is safe

HPV vaccine is effective

WHY ISN'T EVERYONE VACCINATED YET?

Adolescent Vaccination Coverage
United States, 2006-2014



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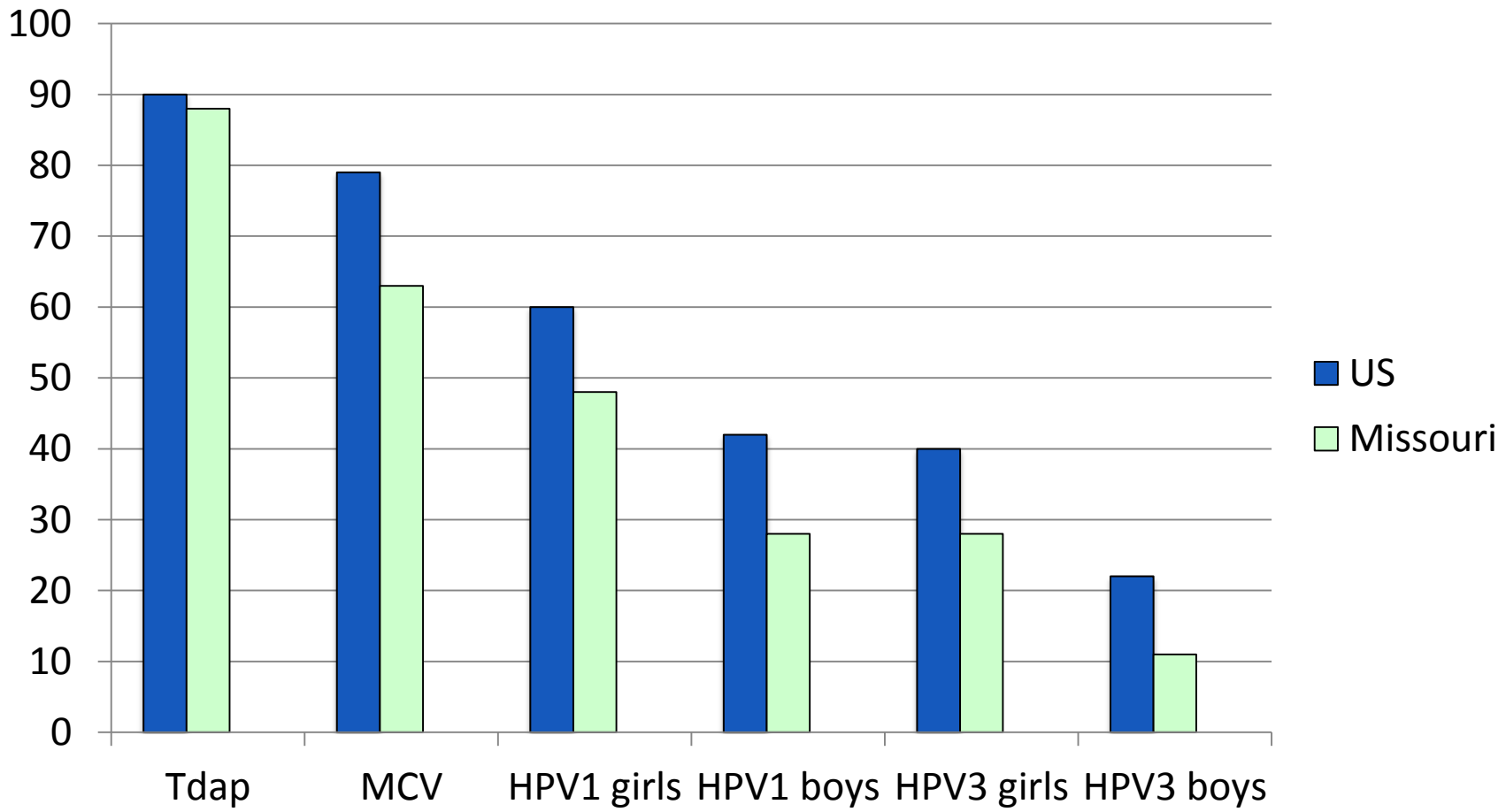
Vaccination rates in Missouri compared to the US overall



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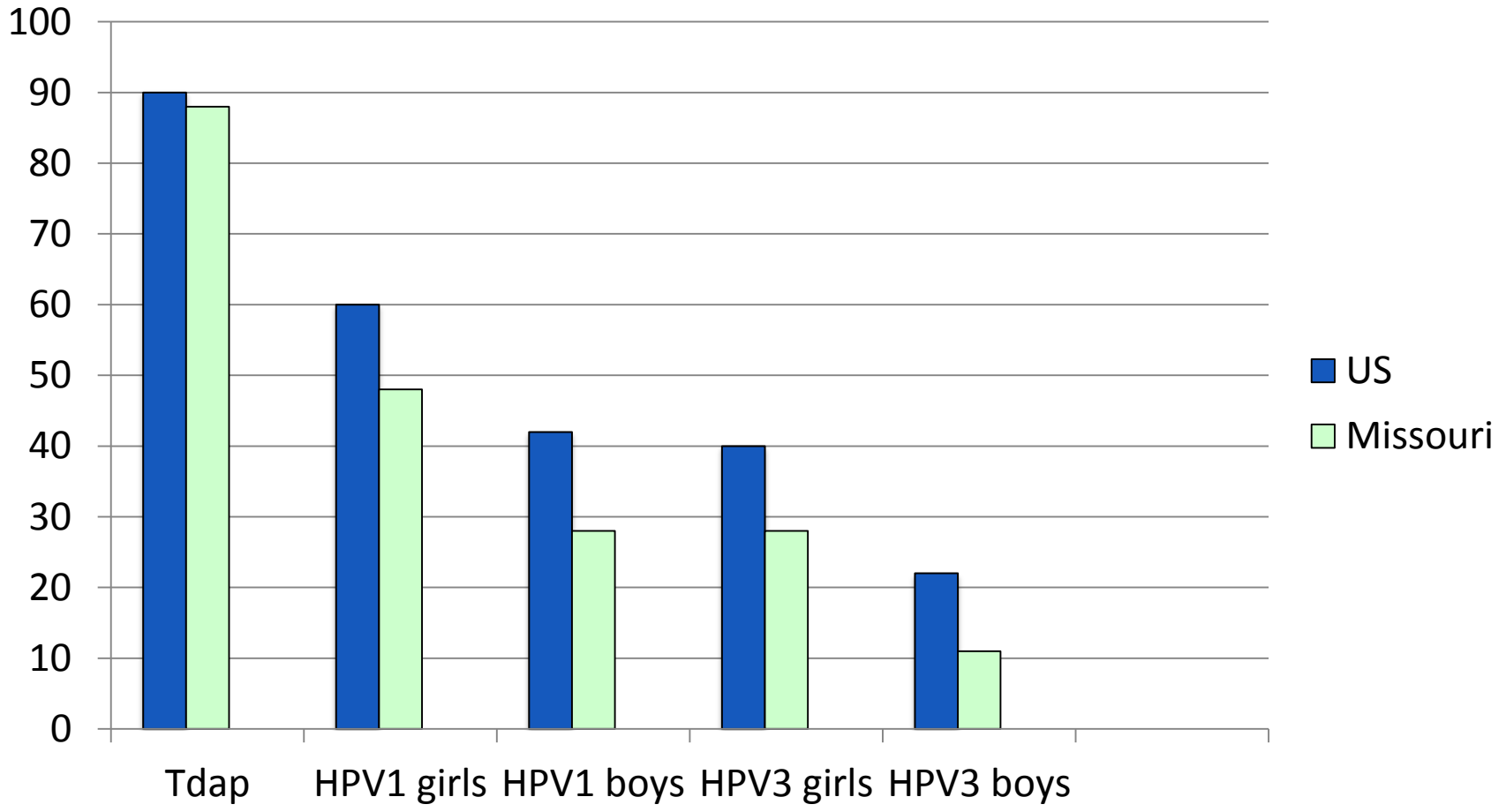
Vaccination rates in Missouri compared to US

Tdap is equal, but HPV is about 10-15% lower



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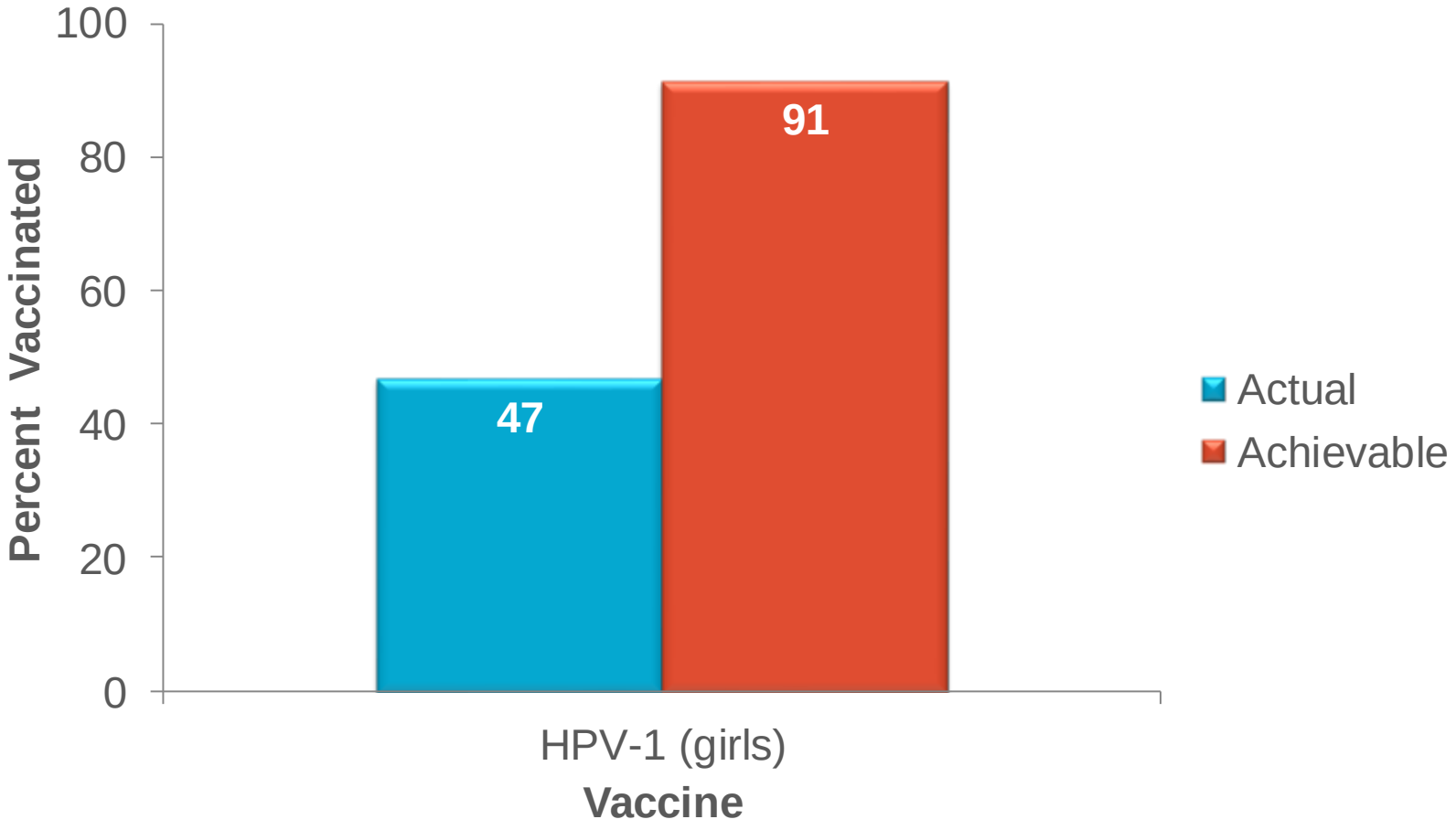
Impact of Eliminating Missed Opportunities by Age 13 Years in Girls Born in 2000



Missed opportunity: Healthcare encounter when some, but not all ACIP-recommended vaccines are given. HPV-1: Receipt of at least one dose of HPV. MMWR. 63(29);620-624.

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A WORD ON SEXUAL PROFILING: *DON'T DO IT*

- 80% of people will be exposed to HPV
- You can't predict who or when

Would you tell your patient not to wear a seatbelt because you thought they looked like a good driver?

Delays lead to missed opportunities

Providers introduce HPV vaccination at 11 but do not recommend it strongly

- ***"I'd honestly say it's rare that I spend more than 20 seconds on it at 11… So few 11 year olds are physically mature to be sexually active that it's, I find it's almost sort of an awkward conversation."***

Providers and parents may not understand that the vaccine is most effective when all three doses are finished by age 14.

- ***"I thought that it didn't really make any difference as long as they had the three vaccines before their 20's."***

And delays intended to be temporary may become permanent

Perkins et al, Pediatrics, 2014

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Each adolescent visit may be the last chance to vaccinate!

- 30% of adolescents never present for preventive care
- 1 in 15 adolescent visits is for preventive care
- Preventive visits decline after age 13
- Early adolescents (11-14 years old) had 3 times more preventive visits than late adolescents
- *Use sick and well visits to vaccinate*

Rand et al. Arch Pediatr Adolesc Med; MMWR 2016

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Evidence-based effective recommendation

Effective framing

- **"Today your child is due for 3 vaccines: Tdap, HPV, and meningococcal."**

- ***HPV is framed as important***
- ***Many parents just say yes– because they trust you!***

- **Making your job harder**
- **"Today your child is due for the Tdap and meningococcal vaccines. We should also talk about the HPV vaccine…"**

- ***HPV is framed as "something different"***
- ***Parents sense confusion and your job gets harder***

Effective framing works at least 10 times better!

Opel DJ, Pediatrics, 2013

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Why does framing makes a difference

Ineffective first discussion

Provider: Meghan and Mark are due for some shots today: Tdap and the meningococcal vaccine. There is also the HPV vaccine…

- Vaccine perceived as different, optional, unimportant

Effective first discussion

Provider: Meghan and Mark are due for some shots today: HPV, meningococcal vaccine, and Tdap.

- **Presumption of vaccine uptake**
- **Vaccination perceived as normative, important**

Addressing catch-up population

Provider: I see that Meghan and Mark haven't gotten their HPV vaccines yet. We should definitely start that today!

- Presumption of vaccine uptake, conveys message of importance

Perkins et al, Pediatrics, 2014

Providers overestimate parent's concerns

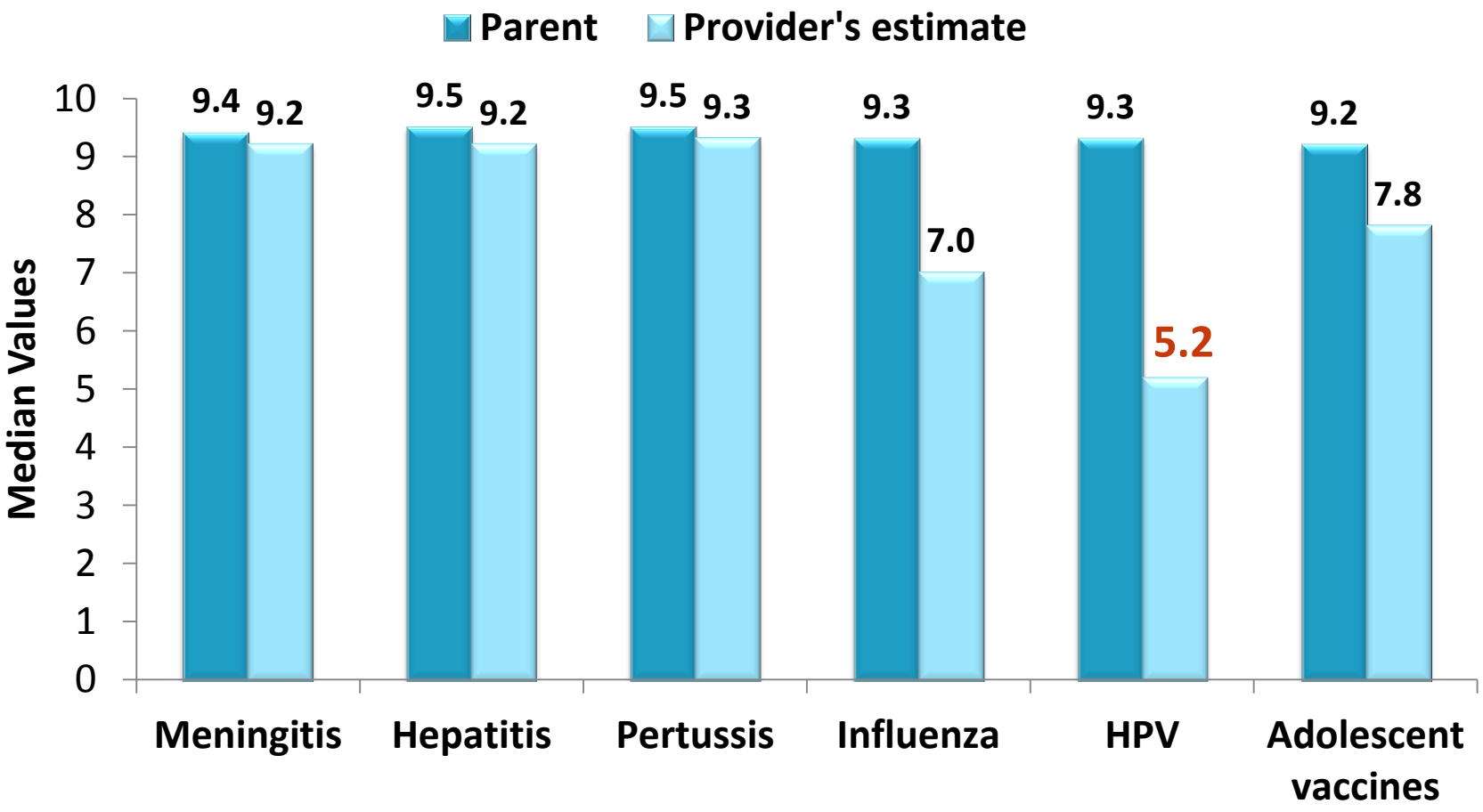
"From what I understand the vaccine is safe, efficacious and I'd be a fool and also have amnesia to believe that high schoolers do not engage in unwise sexual practices at times." —Father of a 12 year-old

55-90% of parents and adolescents will follow provider recommendations

Most parents also believe their sons and daughters would at some point be at risk for STIs

Perkins et al, Pediatrics 2014; Brewer 2007, Prev Med

Clinicians Underestimate the Value Parents Place on HPV Vaccine



Adapted from Healy et al. Vaccine. 2014;32:579-584.

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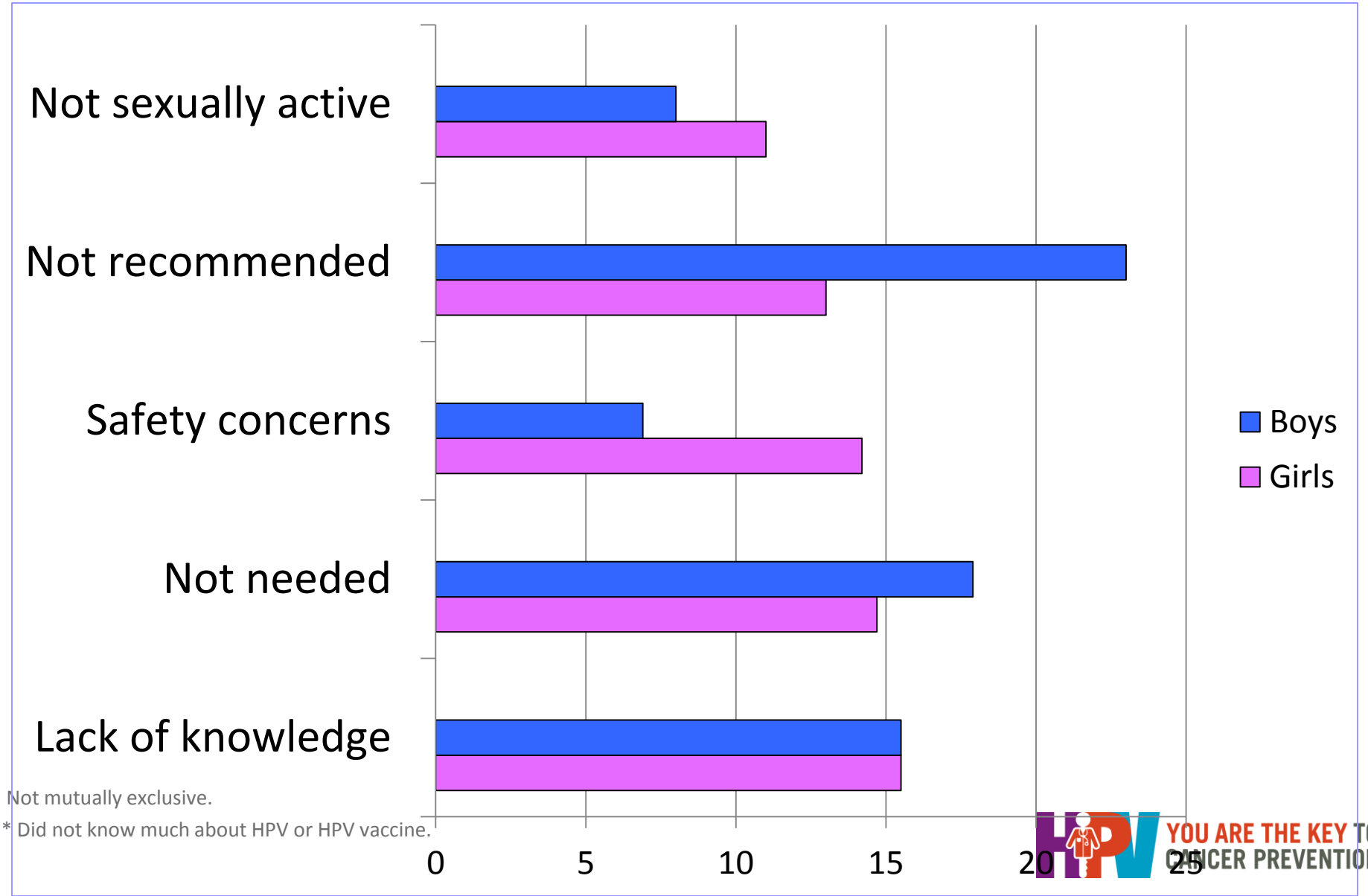
Parents top 5 reasons for not vaccinating their daughters and sons, NIS-Teen 2013



* Not mutually exclusive.

** Did not know much about HPV or HPV vaccine.

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You can reassure parents that HPV vaccination does *not* change sexual behavior

- 3 large studies including >200,000 girls & young women
- HPV vaccination NOT associated with
  - Being sexually active
  - Number of sexual partners
  - Receiving counseling on contraceptives
  - Testing for or diagnoses of sexually transmitted infections

Liddon NC, *Am J Prev Med* 2012;42:44
Bednarczyk RA, *Pediatrics* 2012;130:798
Jena AB, *JAMA Intern Med, 2015*

Addressing all concerns in 45 seconds

Provider: Meghan and Mark are due for their HPV vaccine.

Parent: Why do they need an HPV vaccine?

Provider: The HPV vaccine will help protect them from cancer caused by HPV infection. We know that HPV infection is dangerous– 27,000 people in the US get cancer from HPV every year. And we know that the HPV vaccine is safe– over 100 million doses have been given and there haven't been any serious side effects.

Parent: I don't think they need that yet…

Provider: Vaccines only work if they're given before exposure– we never wait until a child is at risk to give any recommended vaccines. HPV vaccine is also given as early as possible because it produces a better immune response in younger adolescents. That's why it is so important to start the shots now and finish all 3 of them in the next 6 months.

Discuss HPV vaccination in the context of mom's cervical cancer

One doctor says:

"In your experience with your health right now, you may be screened for cervical cancer by means of a pap smear… because cervical cancer can obviously be something that can be life-threatening but if caught soon, it can be taken care of, and this is how your health is impacted by this virus right now. Well, children now have the option of getting the HPV vaccine which is actually very effective at reducing the risk for contracting that same virus."

How does the Chair of ACIP do it?

"When discussing HPV vaccine with 11 and 12 year-olds and their parents, I will ask the simple question:

When do you want your children to put on their bike helmets?

- **A. Before they get on their bike**
- **B. When they are riding their bike in the street**
- **C. When they see the car heading directly at them**
- **D. After the car hits them**

I usually end up with a smile and a successfully launched series."

Temte JL, Pediatrics 2014, letter to the editor

HPV YOU ARE THE KEY TO CANCER PREVENTION

HPV is common and dangerous

- ***3 million Americans seek medical treatment for HPV-related disease every year***
- ***10,000 women every year get cervical cancer– 30% of them were screened on time***
- ***17,000 men and women every year get HPV-related cancers for which there are no screening tests***

We can do better

YOU ARE THE KEY TO CANCER PREVENTION

HPV vaccination *IS* high quality care

- Recommend the HPV vaccine the **same way** and on the **same day** you recommend Tdap and meningococcal vaccines.
- Hearing "HPV vaccine is cancer prevention" helps parents make the decision to vaccinate.

A strong recommendation is critical

Conclusions

Vaccinating all your patients with HPV vaccines will save lives and improve health

For more information, including free resources for providers and patients:

AAP HPV champion toolkit:
https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Pages/HPV-Champion-Toolkit.aspx

cdc.gov/vaccines/teens

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