

# Update on HPV Vaccination Coverage and Challenges in the US

Shannon Stokley, MPH  
National Center for Immunization and Respiratory  
Diseases

National Vaccine Advisory Committee Meeting  
February 5, 2013



## **Overview**

- ❑ **HPV vaccine recommendations for females and males**
- ❑ **HPV vaccination coverage among adolescents**
- ❑ **Challenges to HPV vaccination**
- ❑ **School located vaccination**

# HPV-associated cancers United States, 2004-2008

Anatomic Area	Average annual number of cases*	Estimated+	
		HPV attributable	HPV 16/18 attributable
Cervix	11,967	11,500	9,100
Vagina	729	500	400
Vulva	3,136	1,600	1,400
Anus (F)	3,089	2,900	2,700
Oropharynx (F)	2,370	1,500	1,400
<b>Total (Females)</b>	<b>21,291</b>	<b>18,000</b>	<b>15,000</b>
Penis	1,046	400	300
Anus (M)	1,678	1,600	1,500
Oropharynx (M)	9,356	5,900	5,600
<b>Total (Males)</b>	<b>12,080</b>	<b>7,900</b>	<b>7,400</b>

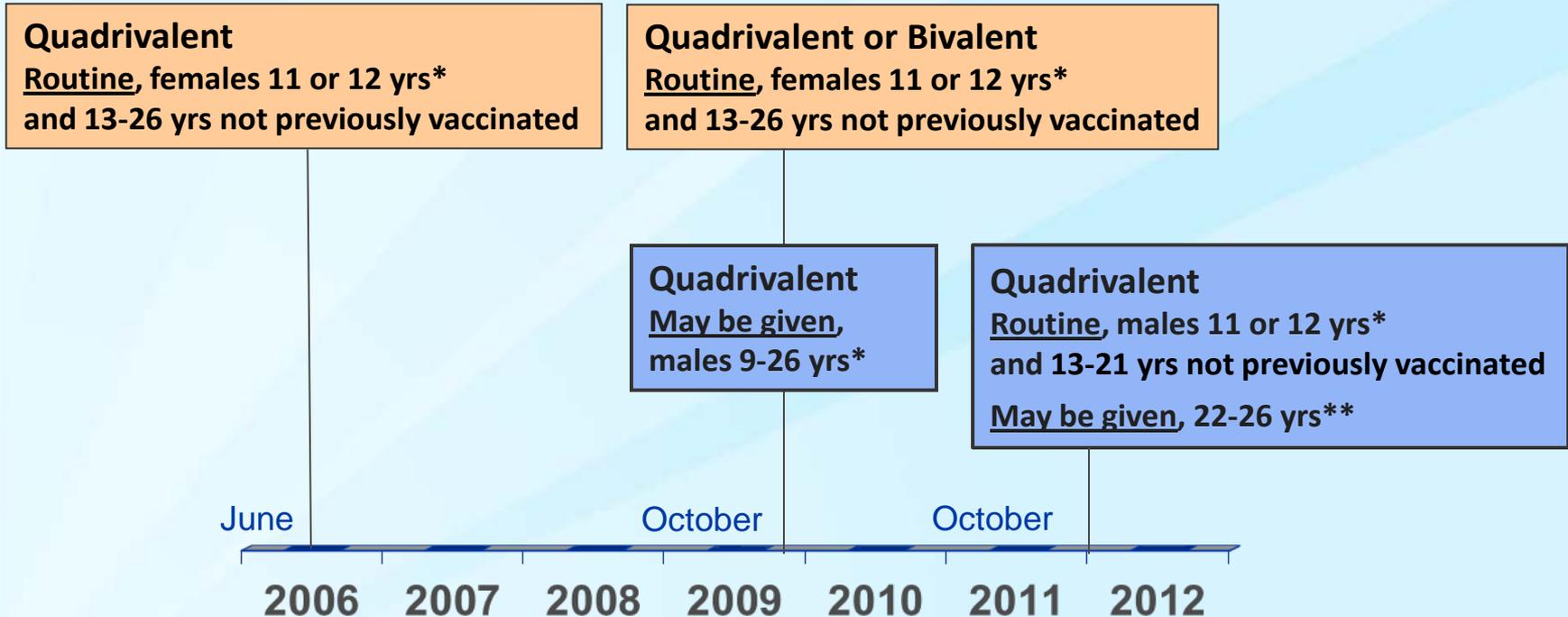
- Defined by histology and anatomic site; Watson M et al. Cancer 2008. Data source: National Program of Cancer Registries and SEER, covering 100% coverage of US population. + Gillison ML, et al. Cancer 2008.
- Ref: Watson et al, Human Papillomavirus-Associated Cancers MMWR 2012;61(15):258-261.

# HPV vaccines

	<b>Quadrivalent</b> (Gardasil)	<b>Bivalent</b> (Cervarix)
<b>Manufacturer</b>	Merck	GlaxoSmithKline
<b>VLP types</b>	6, 11, 16, 18	16, 18
<b>Schedule (IM)</b>	3 doses	3 doses
	<b>Estimated to protect against</b>	
<b>Genital warts</b>	90%	-
<b>Cervical cancers*</b>	70%	70%

\* And majority of other HPV- associated cancers

# Evolution of recommendations for HPV vaccination in the United States



Quadrivalent (HPV 6,11,16,18) vaccine; Bivalent (HPV 16,18) vaccine

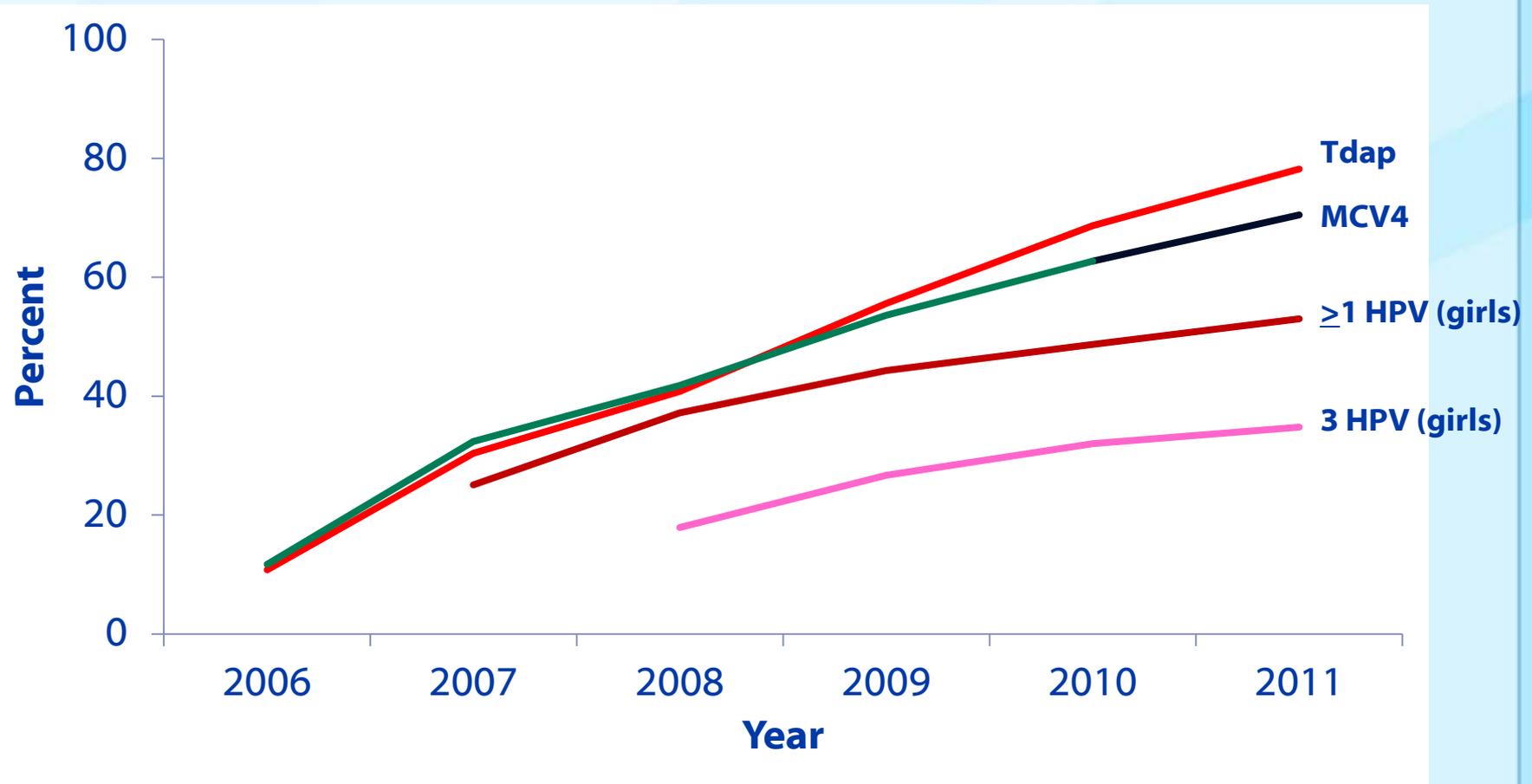
\* Can be given starting at 9 years of age; \*\* For MSM and immunocompromised males, quadrivalent HPV vaccine through 26 years of age

## **US HPV Vaccination Program**

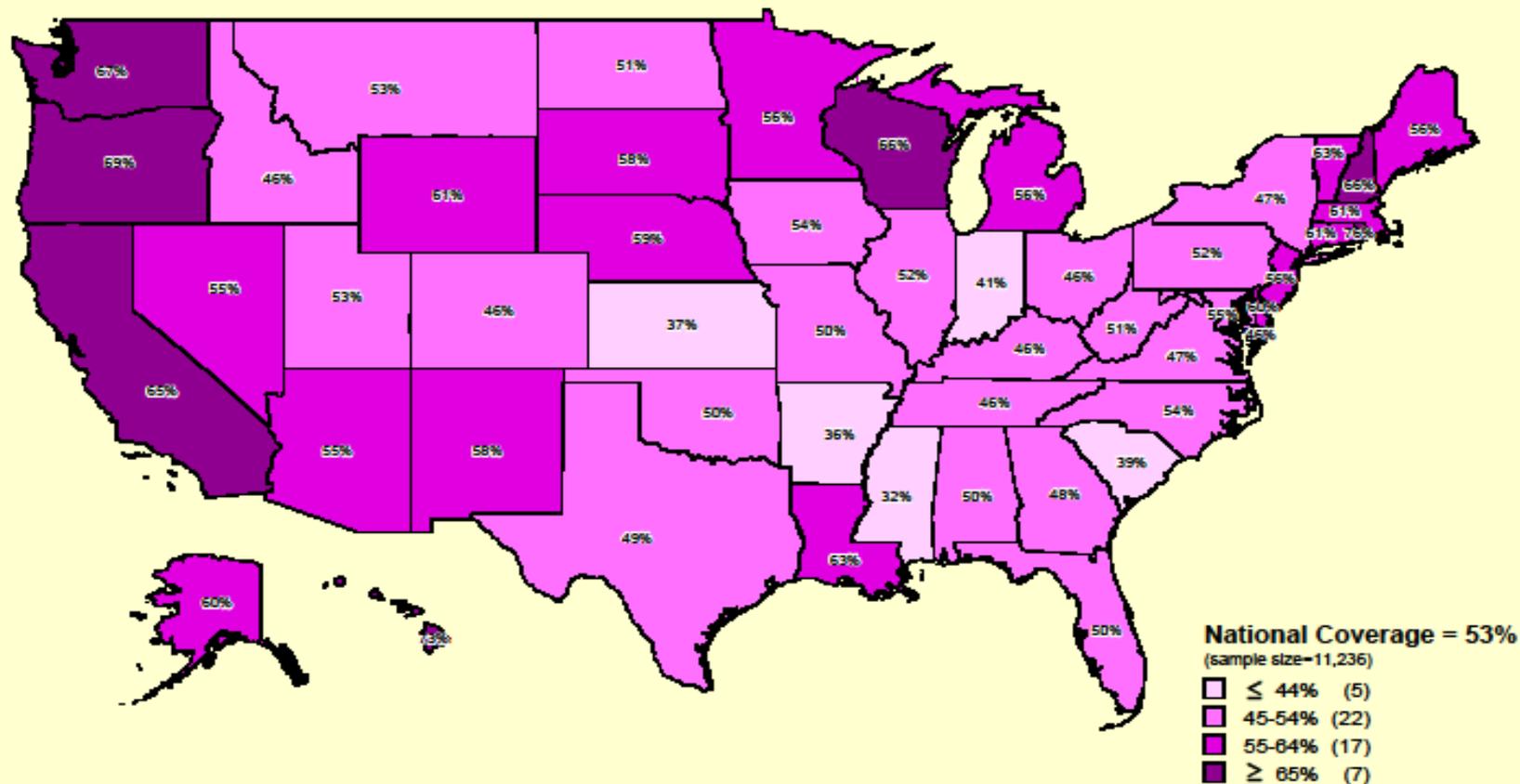
- ❑ HPV is one of several vaccines recommended for the adolescent age group**
- ❑ Majority of vaccines are administered in primary care provider offices and publicly funded clinics**
- ❑ National survey of physicians found that 98% of pediatricians and 88% of family physicians stocked and administered HPV vaccine\***
- ❑ Vaccine covered by most private health insurance companies and government insurance programs**
- ❑ In 2011, 39.4% of adolescents 13-17 years of age were eligible for VFC vaccine**

**\*Daley et al. Pediatrics. 2010;126:425-433.**

# National Estimated Vaccination Coverage Levels among Adolescents 13-17 Years, NIS-Teen 2006-2011



## Coverage of 1 or More Doses of HPV\* Female Adolescents Aged 13-17 Years Old, 2011



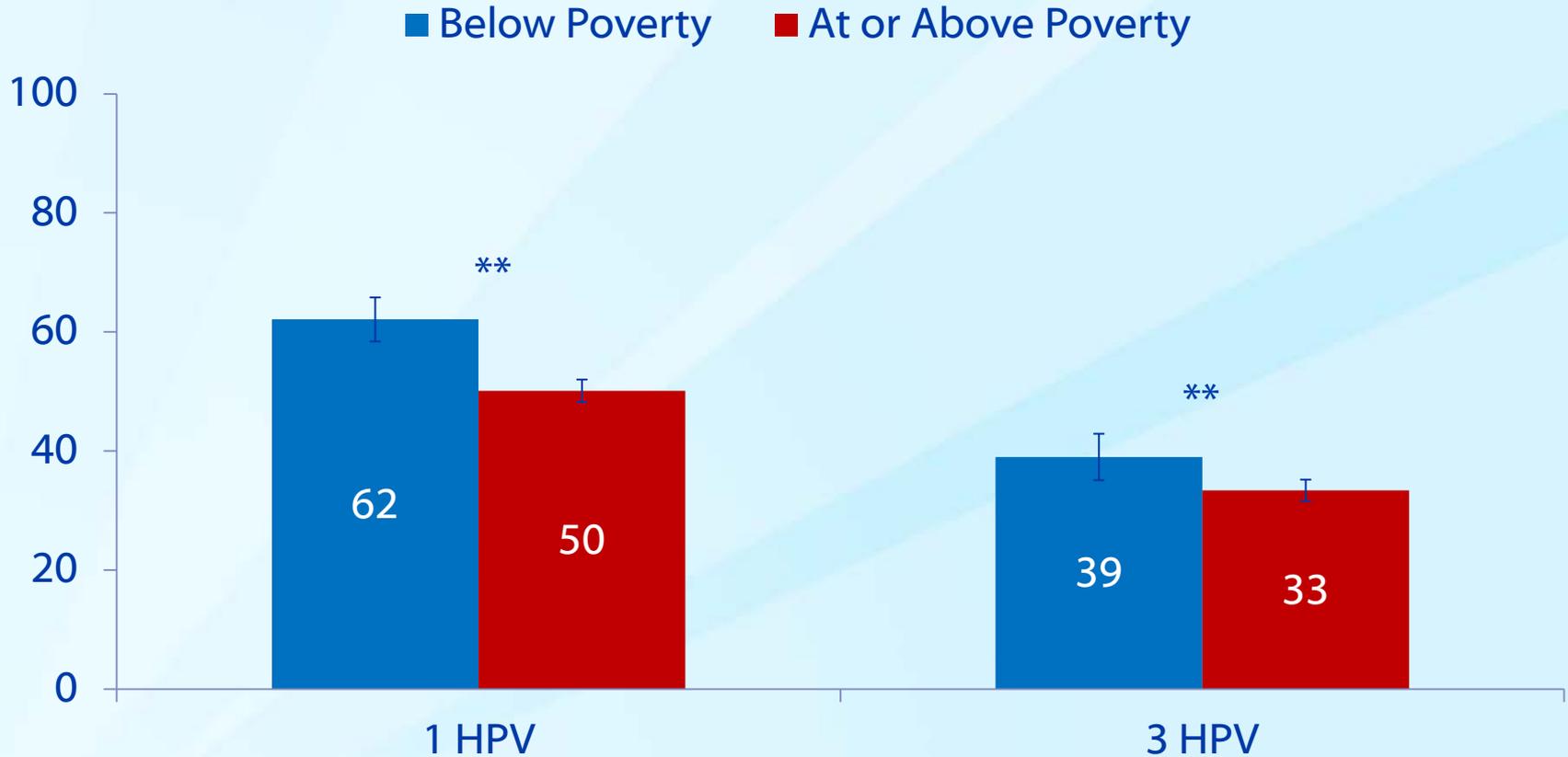
Note 1: \*Human Papillomavirus Vaccine, either quadrivalent or bivalent. Percentages reported among females only.

Note 2: Includes female adolescents born between January 1993 and February 1999

Source: National Immunization Survey - Teen (NIS - Teen)



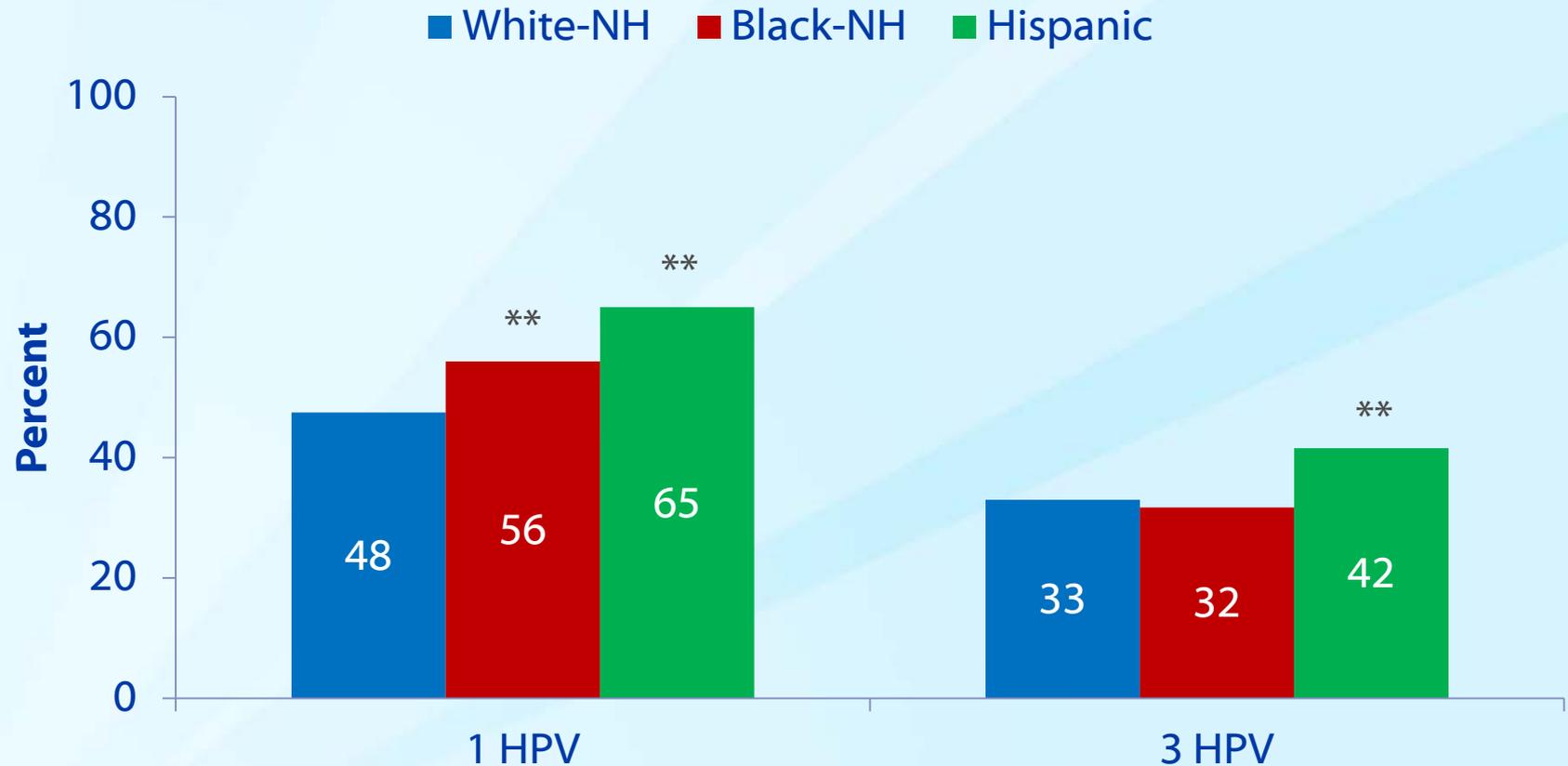
# Vaccination Estimates among Adolescent Girls Years by Poverty Status, NIS-Teen 2011



\*\* statistically different ( $p < 0.05$ )

CDC.MMWR.2012;61:671-677

# HPV Vaccination Estimates among Adolescent Girls 13-17 Years by Race/Ethnicity , NIS-Teen 2011

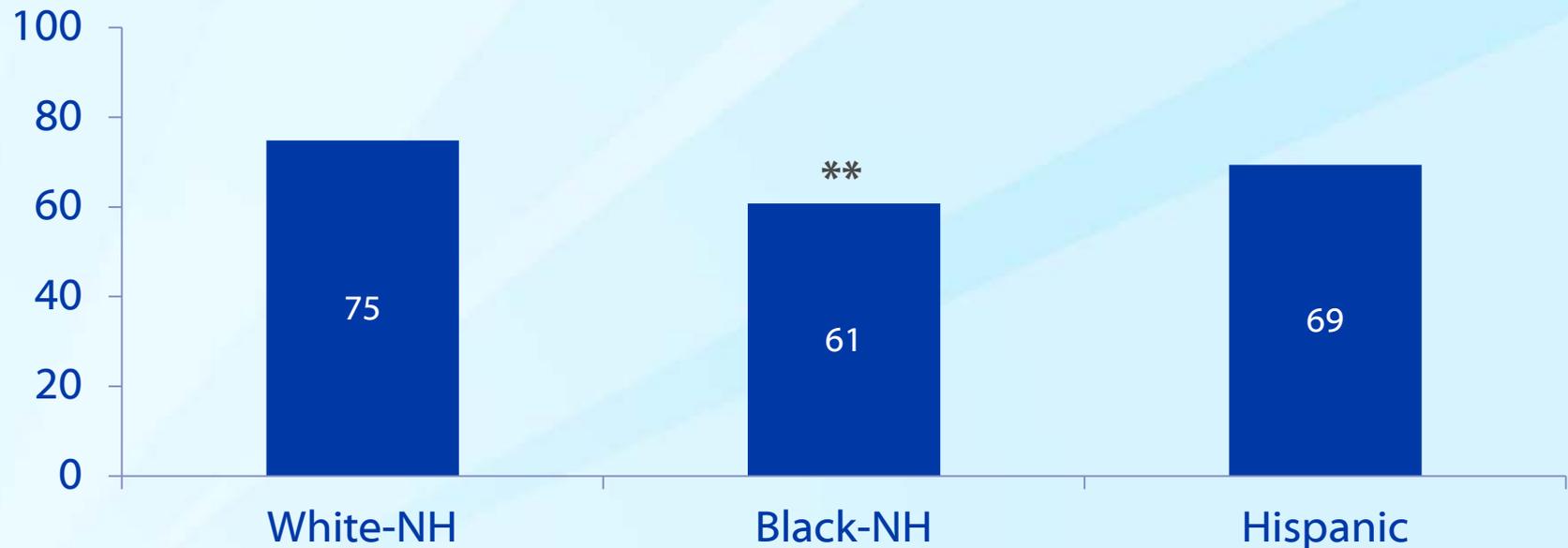


\*\* Statistically different ( $P < 0.05$ ) from White-NH.

CDC.MMWR.2012;61:671-677

# Completion of the HPV series

- ❑ Completion: among the females that started the series, the proportion that received all 3 doses
  - ❑ Nationally, 70% of girls that start the HPV series, complete the series



\*\* Statistically different ( $P < 0.05$ ) from White-NH.

CDC. MMWR. 2012;61:671-677

# HPV Vaccination Uptake among Adolescent Boys

- ❑ **Available data represents vaccination activities prior to implementation of routine recommendation**
- ❑ **8.3% of boys 13-17 years of age have initiated the series\***
- ❑ **Initial uptake follows the same pattern as observed for girls**
  - Higher coverage among boys living below the poverty level
  - Higher coverage among black and Hispanic boys

# Factors Influencing HPV Vaccination

## ❑ Parental factors

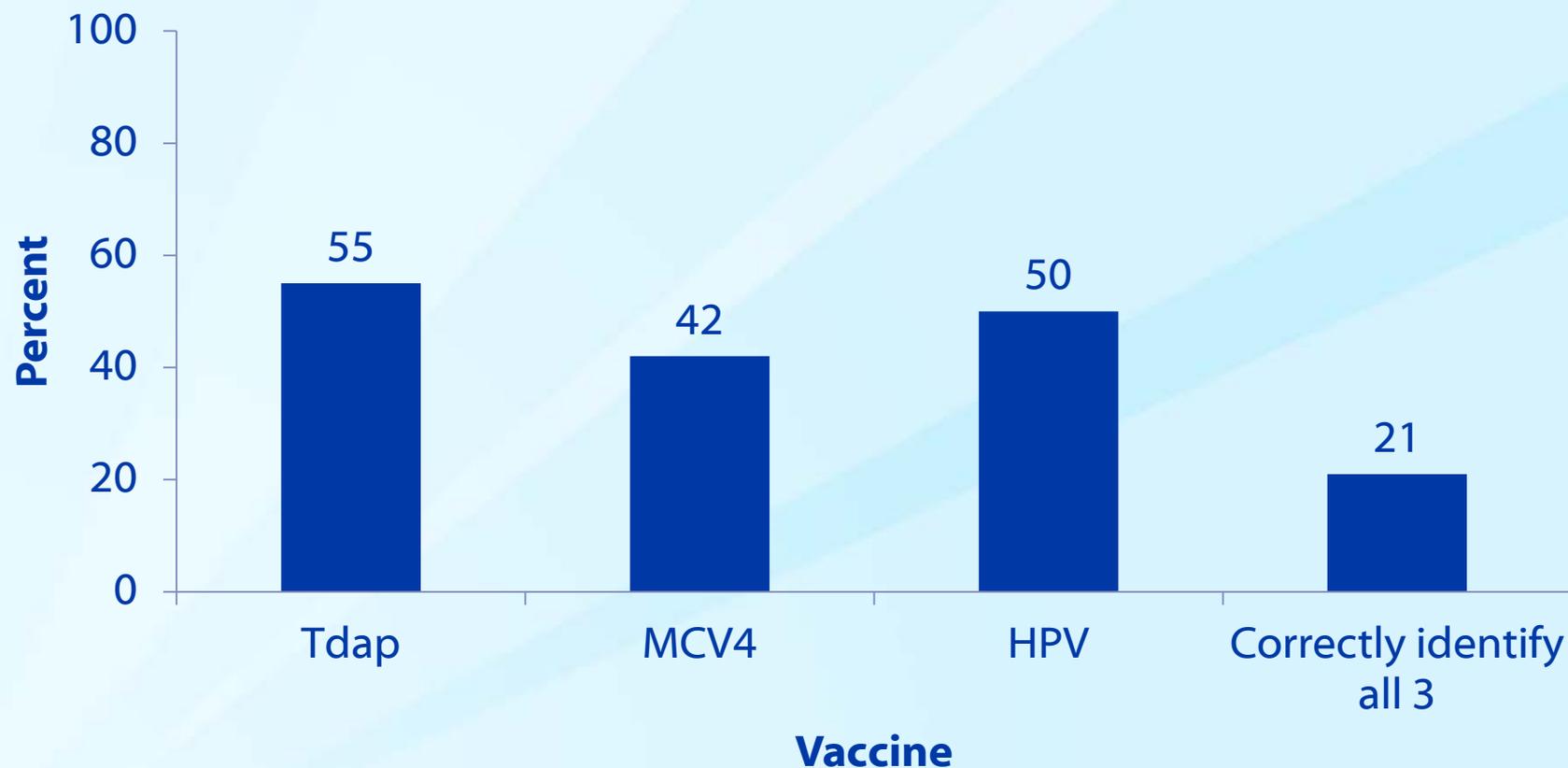
- Knowledge
- Attitudes

## ❑ Provider factors

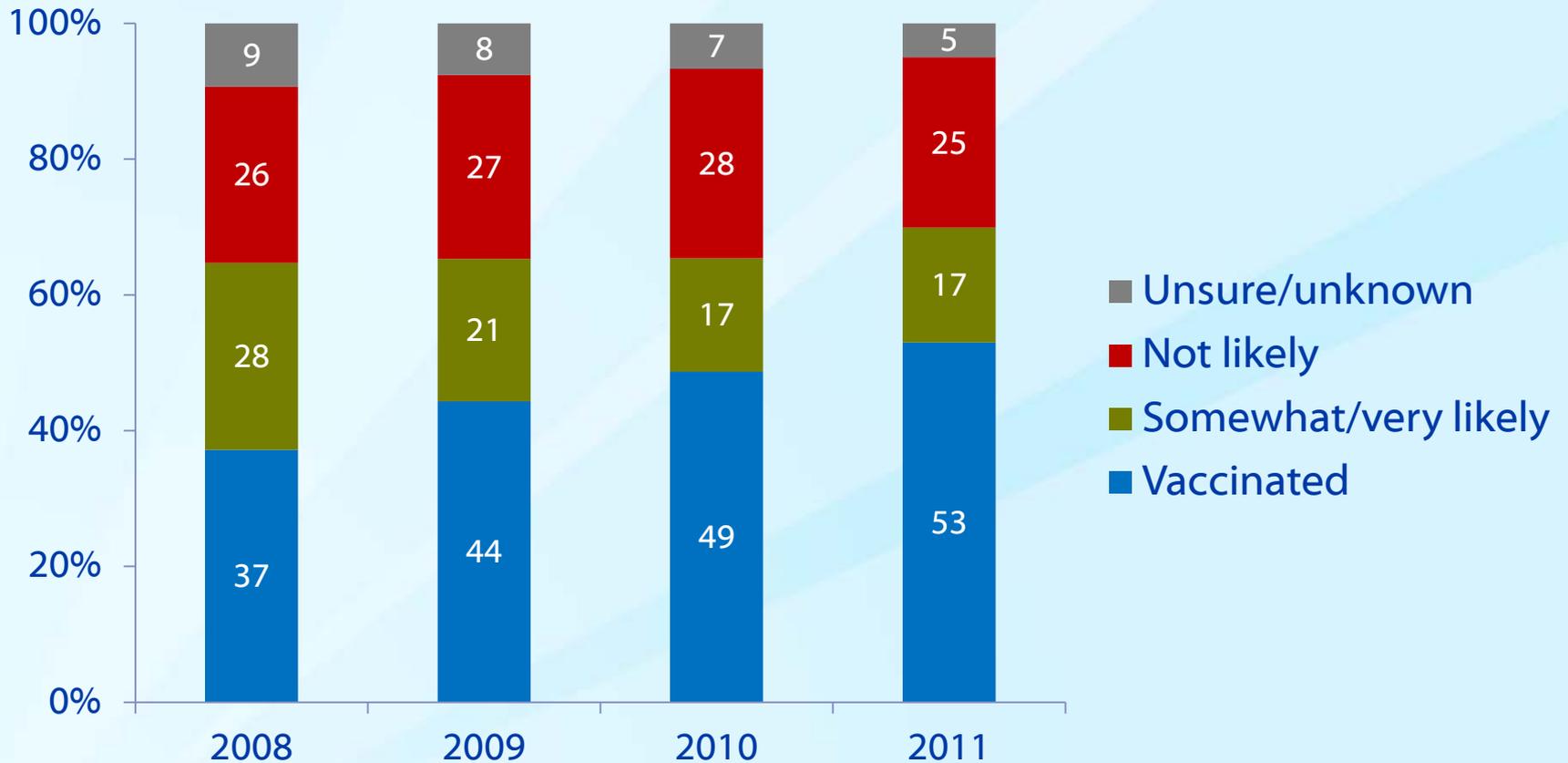
- Weak recommendations
- Missed opportunities

# Knowledge of Vaccine Recommendations among Parents of Adolescents 11-18 years, 2007

## HealthStyles Survey



## HPV Vaccine Intentions (in the Next 12 Months) Among Parents of Adolescent Girls 13-17 Years, NIS-Teen



## **Top 5 reasons\* for not vaccinating daughter, among parents with no intention to vaccinate in the next 12 months, NIS-Teen 2011**

Not needed or necessary	23.2%
Not sexually active	19.5%
Safety concern/side effects	19.3%
Lack of knowledge	15.2%
Not recommended by provider	9.6%

\*Response categories are not mutually exclusive.

# HPV Vaccination and Sexual Behavior

- ❑ **Analysis of 2010 National Survey of Family Growth<sup>1</sup>**
  - HPV vaccination was not associated with being sexually active or number of sex partners
  
- ❑ **Evaluation of girls 11-12 years enrolled in a large managed care organization<sup>2</sup>**
  - HPV vaccination was not associated with increased sexual activity-related outcomes

<sup>1</sup>Liddon et al. Am J Prev Med. 2012;42:44-52

<sup>2</sup>Bednarczyk et al. Pediatrics. 2012;130:798-805.

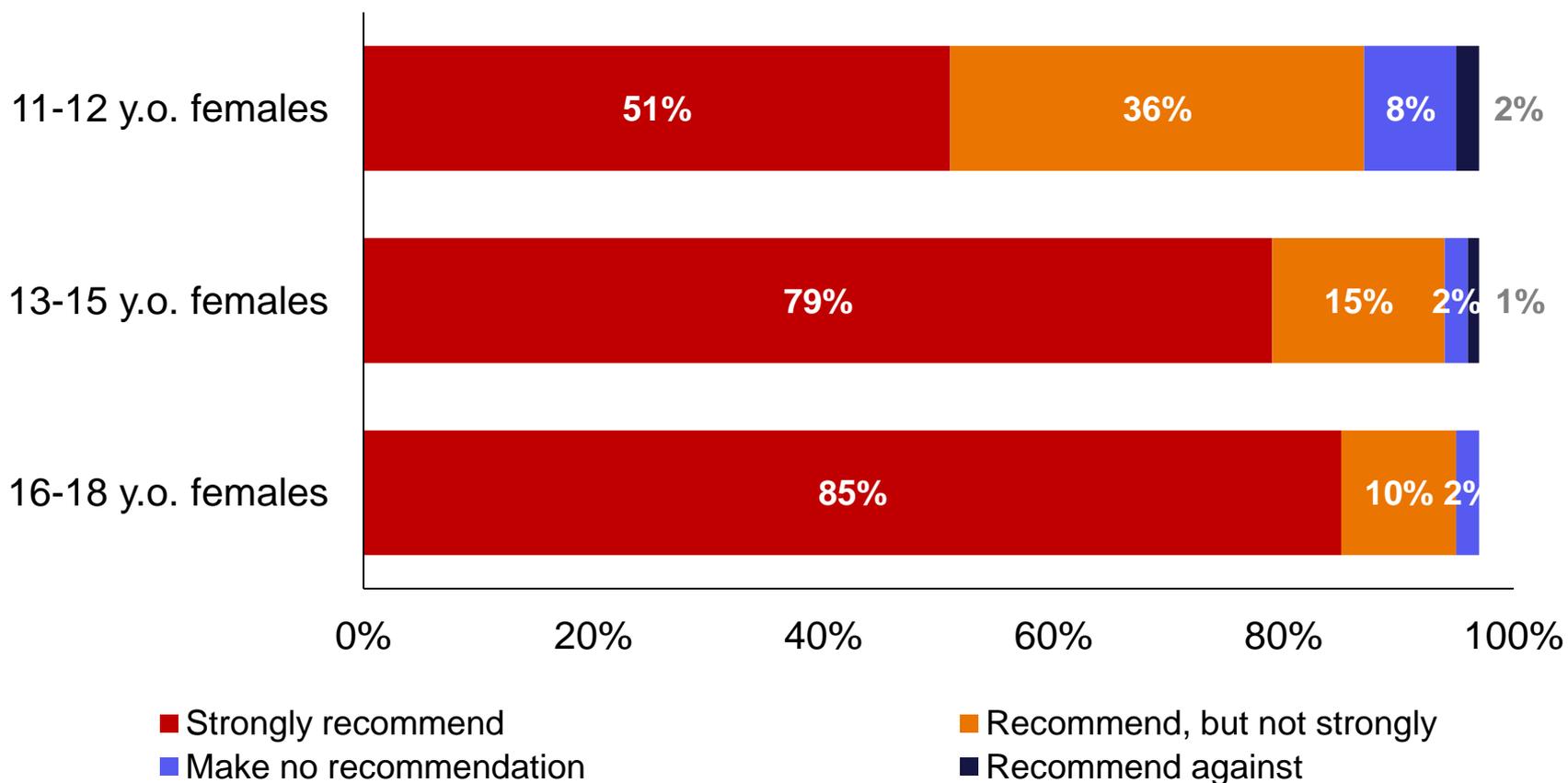
# HPV Vaccine Communications During the Healthcare Encounter

- ❑ **Qualitative review of 184 healthcare encounters where HPV vaccination was discussed<sup>1</sup>**
  - HPV vaccine is presented as 'optional' whereas other indicated vaccines are recommended
  - Some expressed mixed/negative opinions about the vaccine: 'new vaccine'; concerns over safety/efficacy
- ❑ **Qualitative interviews with pediatricians<sup>2</sup>**
  - When parents expressed reluctance, providers were hesitant to engage in discussion
  - Some perceived the vaccine as less important than other vaccines
  - Some providers shared parent's views that teen was not at risk and could delay vaccination until older

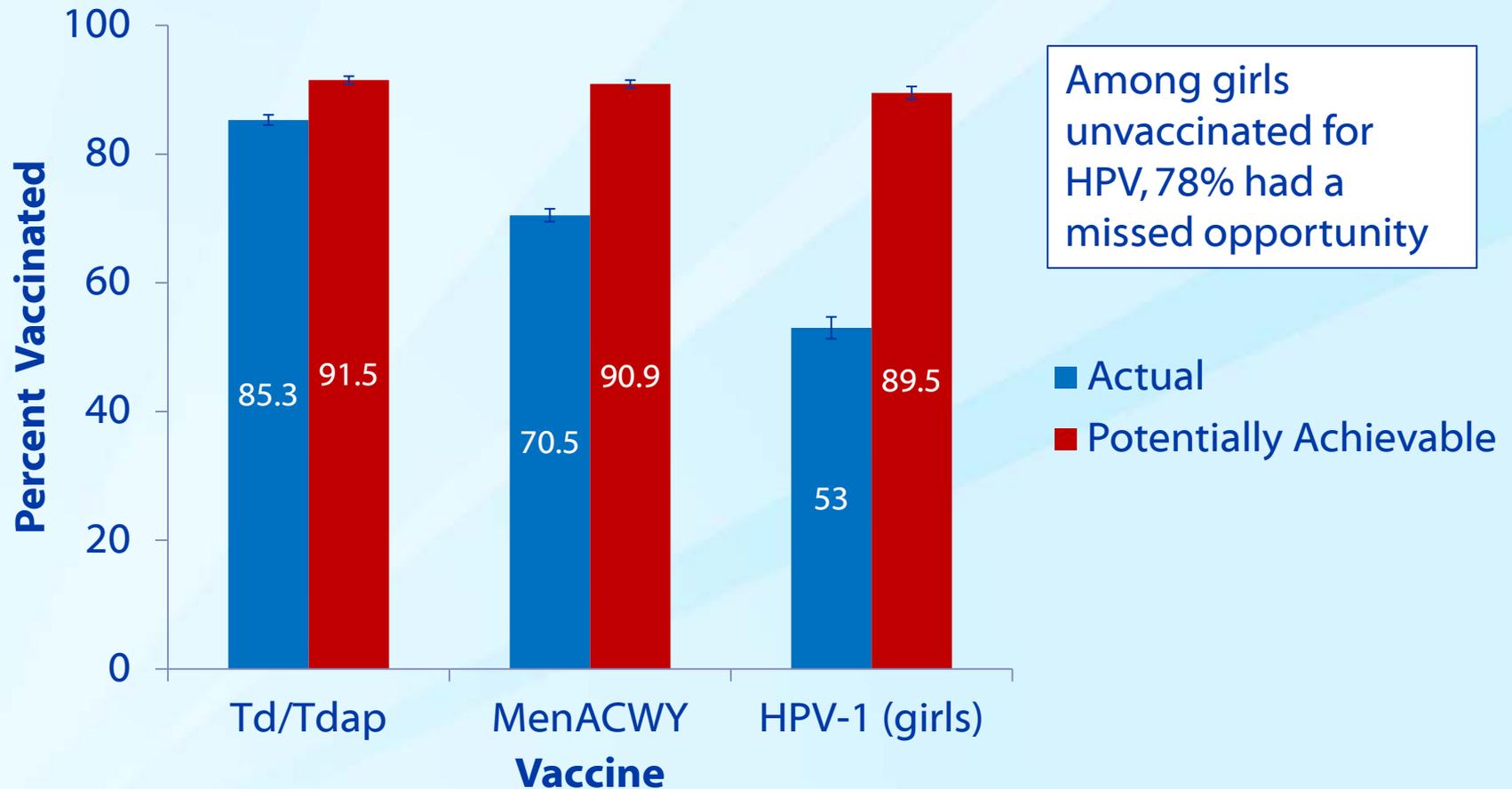
<sup>1</sup>Goff et al. *Vaccine*. 2011;29:7343-7349.

<sup>2</sup>Hughes et al. *BMC Pediatrics*. 2011;11:74. [www.biomedcentral.com/1471-2431/11/74](http://www.biomedcentral.com/1471-2431/11/74)

# Current Strength of Recommendation in Females, Pediatricians and Family Physicians (N=609)\*



# Actual and potentially achievable vaccination coverage if missed opportunities were eliminated: NIS-Teen, 2011



- Missed opportunity: encounter when some but not all indicated vaccines are given

# **SCHOOL LOCATED VACCINATION**

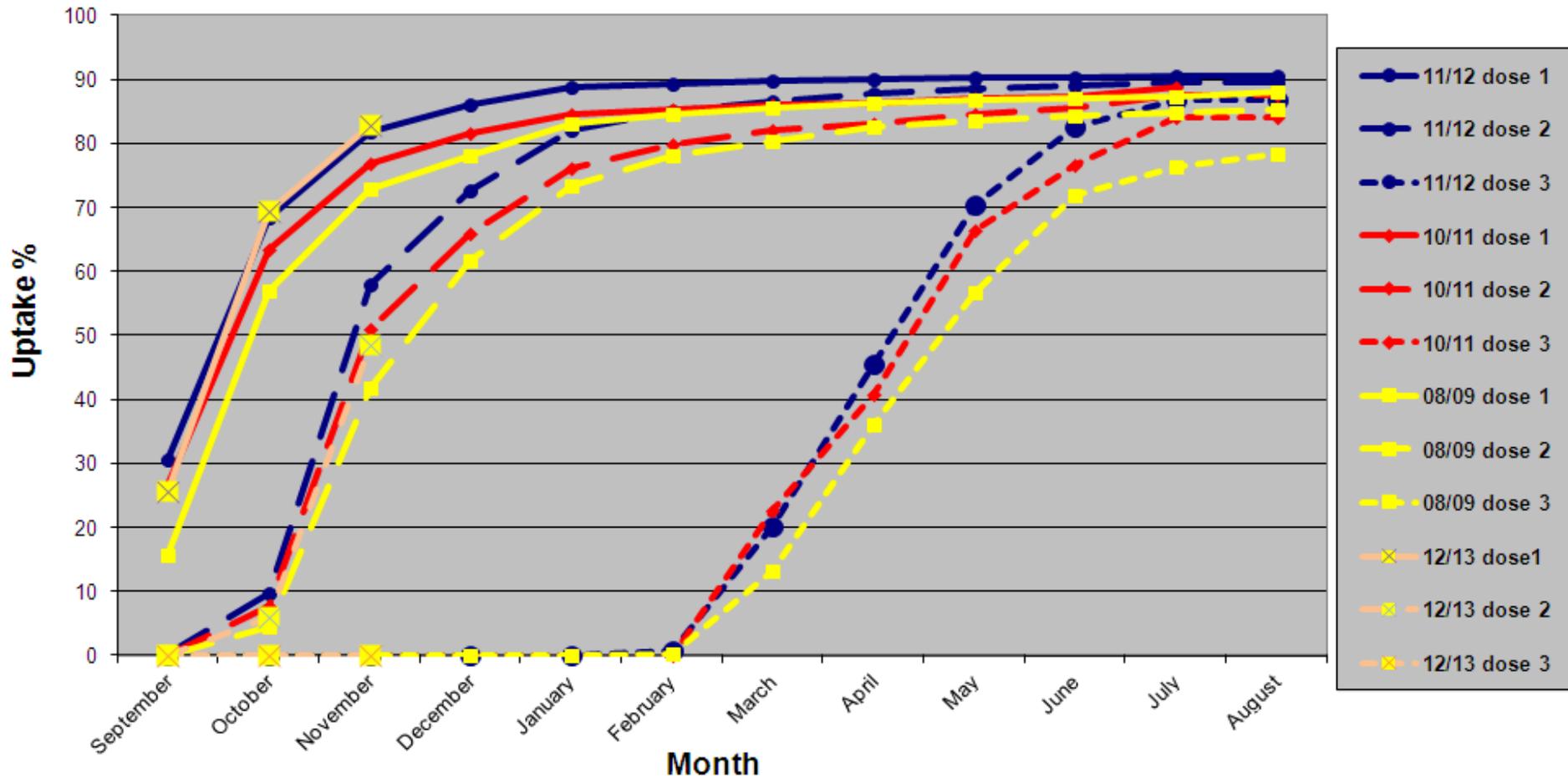
# School Located Vaccination

## □ **Benefits**

- Majority of adolescents attend school
- Can vaccinate a large number of adolescents during a clinic
- Reach many adolescents who may not have regular access to healthcare

# School Located Vaccination – The UK Experience

HPV Vaccinations: 4 Year Comparison, Routine Cohorts Provisional Data from 2008/09, 2010/11, 2011/12 and 2012/13



# **Willingness to Consent for Vaccines Administered at School, Parents of incoming 6th Graders**

- ❑ **Jul – Sep 2009 survey of parents of incoming 6th graders at 3 schools in Aurora, CO**
- ❑ **Parental preference for vaccine location:**
  - 64% doctor's office
  - 17% school health clinic
  - 14% public health clinic
- ❑ **71% of parents would consent for 1 or more vaccines to be administered at school**
  - 53% would consent for HPV

# Adolescent School Located Vaccination Project, Denver Public Schools

- ❑ **Setting: urban public school district**
- ❑ **Time period:**
  - 1st year: January – May 2010
  - 2nd year: August 2010 – May 2011
- ❑ **Targeted schools:**
  - Seven schools serving  $\geq 100$  6th – 8th grade students
- ❑ **Offered 11 vaccines, including Tdap, MCV4, HPV, and Influenza**
- ❑ **Billed 3rd party payers for services provided**

# Adolescent School Located Vaccination Project Outcomes (2<sup>nd</sup> year)

- ❑ **Consented students**
  - 17% (520) of enrolled student returned consent forms, range per school: 8% - 31%
- ❑ **Vaccinated students**
  - 90% (466) of consented students vaccinated with  $\geq 1$  vaccines
  - 1505 vaccines administered, range per school: 77 – 447
- ❑ **Estimated cost per dose, excluding the cost of vaccine: \$26.76**
- ❑ **41% of total costs were reimbursed by billing 3rd party payers**

# Summary

- ❑ **HPV vaccination coverage among U.S. adolescents is increasing, but slowly**
- ❑ **Addressing gaps in parental knowledge and attitudes towards HPV vaccination is needed**
  - Awareness of recommended vaccines is low
  - Improve education: HPV vaccine is a tool to help prevent cancer; it is most effective if given before exposure to the HPV virus
- ❑ **Primary care providers are key to help increase vaccination coverage**
  - Provide strong recommendations
  - Do not delay vaccination
  - Implement evidence-based strategies to improve vaccine delivery
  - Prevent missed vaccination opportunities

## Summary (cont.)

- ❑ **School located vaccination is challenging**
  - Adolescent participation is low
  - The cost to provide vaccination in schools can be quite high
  - Billing health plans is challenging and may not be sufficient to recover program costs

**Thank you**  
zma2@cdc.gov

**For more information please contact Centers for Disease Control and Prevention**

1600 Clifton Road NE, Atlanta, GA 30333

Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

E-mail: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov) Web: <http://www.cdc.gov>

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.



**BACKUP SLIDES**

## State Level Policies

- ❑ **State legislative policies related to HPV vaccine:**
  - Insurance coverage (n=8)
  - Education of parents/general public (n=14)
- ❑ **Presence of these policies are not associated with higher HPV vaccination coverage\***
- ❑ **Middle School Vaccination requirements: 2012-2013 SY**
  - Td/Tdap: 41 states
  - MCV4: 13 states
  - HPV (vaccination): 2 states
  - HPV (education): 7 states

# Percentage of adolescents 13-17 years of age UTD with vaccination(s) by state requirement status\*, NIS-Teen 2010

Vaccine	Vaccination requirement		Education Requirement		No Requirements	
	# of States	(%)	# of states	%	# of states	%
≥1 MCV4	3	(70.5)	10	(51.0)	38	(53.4)
≥1 Td/Tdap	32	(79.8)	--	--	19	(69.5)
≥1 HPV	--	--	6**	(45.0)	45	(44.2)

Red font indicates significantly lower ( $p < 0.05$ ) coverage compared to states with vaccine requirements.

\*Status based on requirements for the 2008-2009 School Year

\*\*Because of small sample size, one state with a vaccine requirement is included with the states with education only requirements.

# System Level: Upcoming Policy Changes

## ❑ Patient Affordable Care Act

- Insurance plans to provide first dollar coverage for all ACIP recommended vaccines

## ❑ Time limited increase in Medicaid reimbursement for vaccine administration fee

- Time period: 2013-2014

## ❑ New HEDIS measure

- Receipt of 3 doses of HPV vaccine by age 13 years (females only)

## Factors that influence parental decisions to vaccinate their adolescents by HPV vaccination status, NIS-Teen 2010

Factor	Vaccinated (%)	Not Vaccinated (%)
At visit made for [TEEN], did you talk to the doctor?	93.3	89.9*
At visits made for [TEEN]'s vaccinations, did his/her healthcare provider:		
Talk to you about the vaccine	89.6	68.4*
Recommend the vaccine	87.8	54.4*
How did [TEEN]'s healthcare provider play a role in your decision about getting him/her vaccinated with the vaccine?		
Made you more likely to get [TEEN] vaccinated	72.4	23.9*
Made you less likely to get [TEEN] vaccinated	0.9	8.2*
Did not affect your decision	26.7	67.8*

\*Significantly different (p<0.05)

# Evidenced based strategies to improve vaccination coverage\*

## ❑ **Reminder/recall system**

- Provider level (e.g., EMR prompts)
- Parent/patient level (e.g., postcards, telephone calls, text messaging)

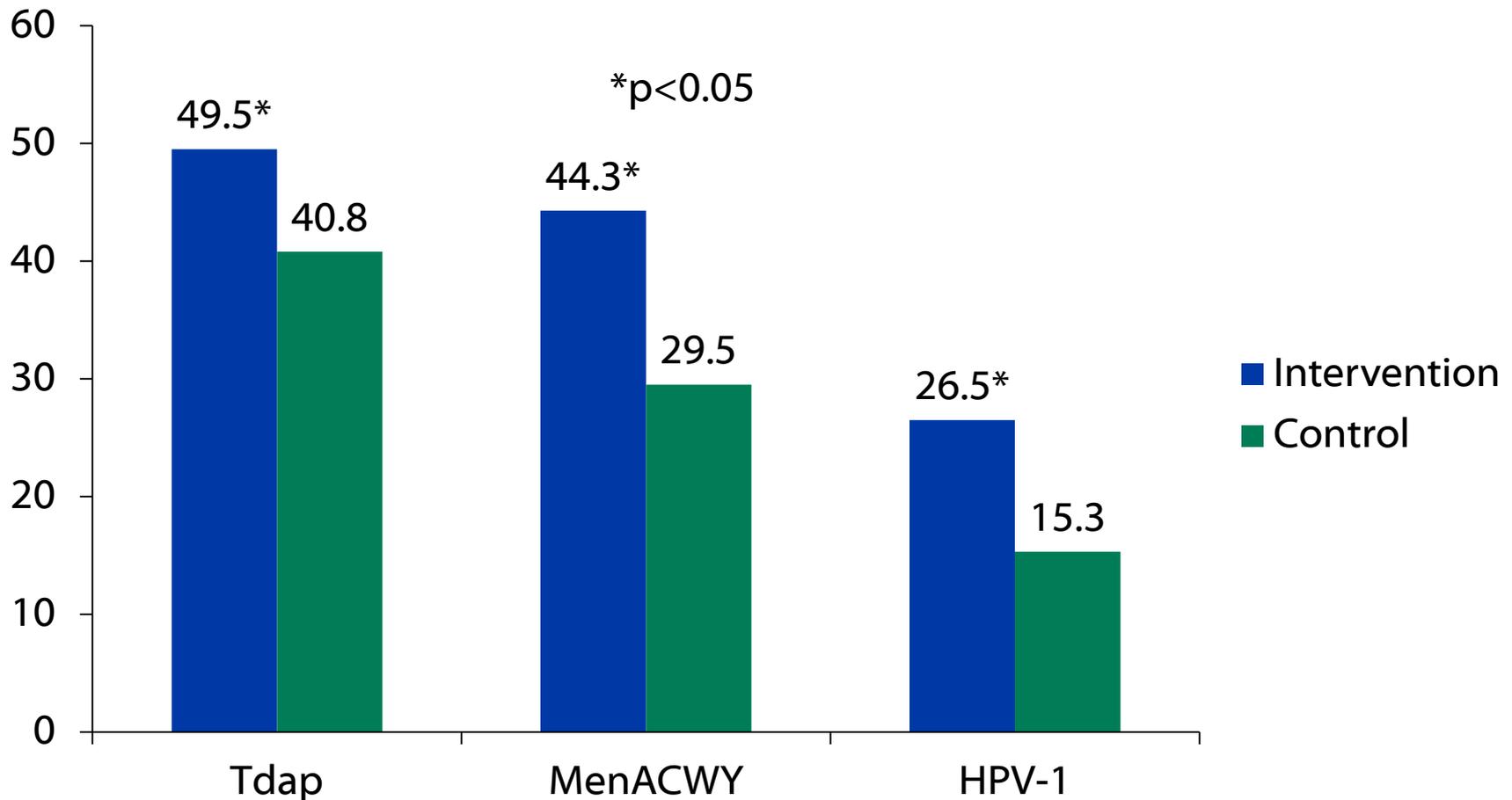
## ❑ **Standing orders**

## ❑ **Provider assessment and feedback**

- Assessment of vaccination coverage levels within the practice and discussion of strategies to improve vaccine delivery

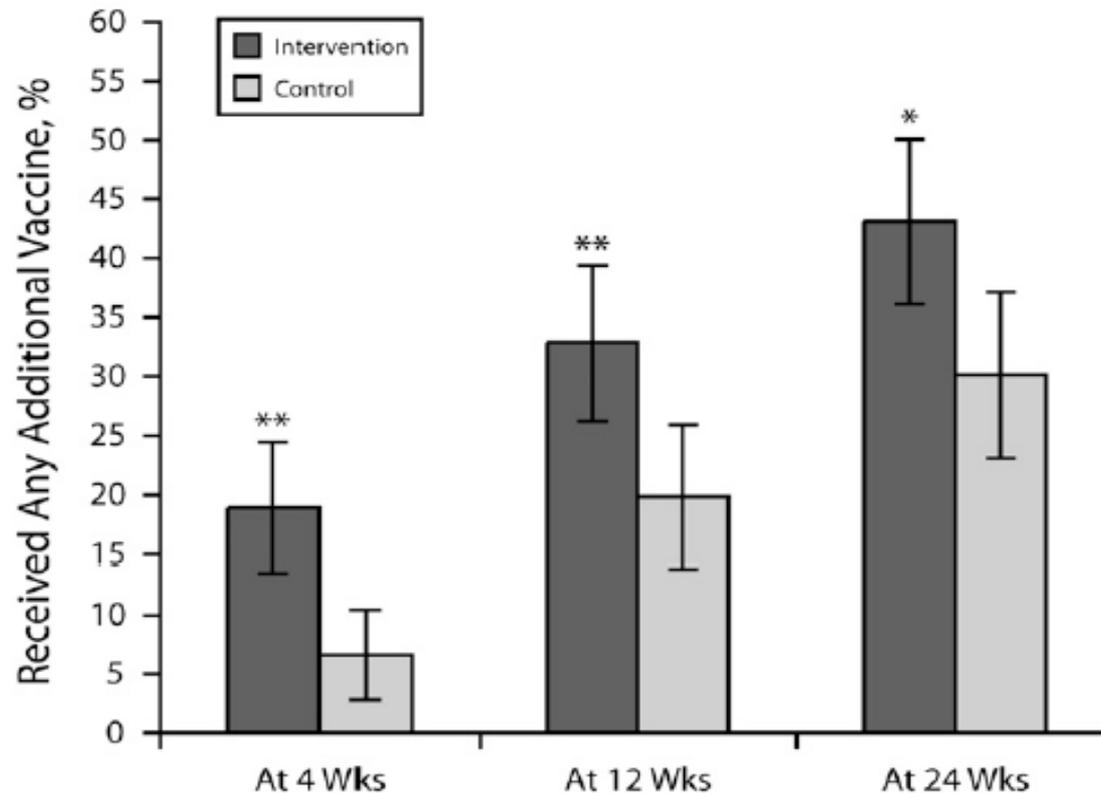
## ❑ **Utilizing immunization information systems**

## Impact of a Reminder/Recall Intervention among Adolescents 11-18 years\*



\*Conducted Feb 2008 – Aug 2009 in 4 practices in Denver Metro Area. R/R consisted of a letter, 2 autodialer phone calls, followed by a second letter.

## Percentages of adolescents 11-18 years of age who received any vaccination at 4, 12, and 24 weeks: Text4Health-Adolescents, New York City, 2009\*

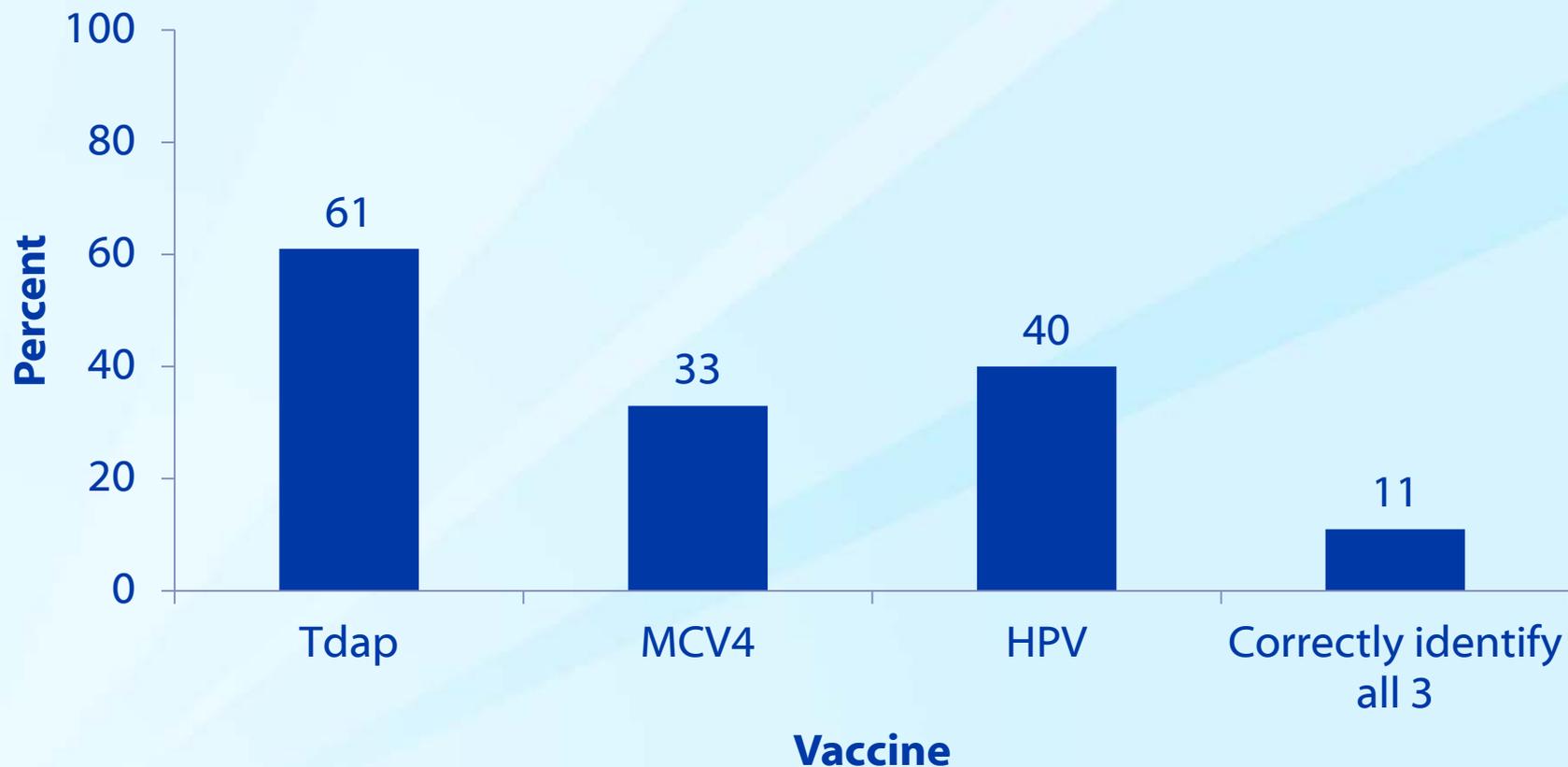


Note. Most common vaccines administered included meningococcal (MCV4), tetanus-diphtheria-acellular pertussis (Tdap), human papillomavirus (HPV), hepatitis A, influenza, varicella, and measles-mumps-rubella.

\* $P < .05$ ; \*\* $P < .01$ .

# **THE ROLE OF THE ADOLESCENT**

# Knowledge of vaccine recommendations among adolescents of 11-18 year olds, 2007 YouthStyles Survey



## Vaccine Attitudes among Adolescents 11-18 Years, 2007 YouthStyles Survey

Attitude	Really/Sort of Agree (%)
Getting vaccines is one way I can protect my health	91
I have concerns about the safety of recommended vaccines	43
I will get a vaccine if my parent says I should	87
I will get a vaccine if my healthcare provider says I should	84
I will get a vaccine if my friends are getting it too	17

# Adolescent Participation in HPV Vaccine Decision Making During the Healthcare Encounter

- **Qualitative interviews with clinician/parent/adolescent triad\***
  - Teens considered themselves passive participants in decision making, even when parents and clinicians reported including them in the process
  - All teens sampled reported that they were satisfied with their role in the decision making, and parents were also satisfied with the level of teen involvement.
  - The main way that adolescents reported taking part in the vaccine discussion was to express concern about anticipated pain from shots

## Factors that influence parental decisions to vaccinate their adolescents by HPV vaccination status, NIS-Teen 2010, Parental Concerns Module\*

Factor	Vaccinated (%)	Not Vaccinated (%)
Did [TEEN] play a role in your decision to get him/her vaccinated or not?		
Made you more likely to get [TEEN] vaccinated	32.0	11.3*
Made you less likely to get [TEEN] vaccinated	2.3	9.1*
Did not affect your decision	65.7	79.6*

\*Significantly different (p<0.05)

Dorell et al. Clinical Pediatrics. 2012. DOI: 10.1177/0009922812468208

## **Ability to Consent for Vaccination**

- ❑ **It is not uncommon for adolescents (especially older adolescents) to visit their healthcare provider without the parent**
- ❑ **With some exceptions, parental consent is required to vaccinate adolescents <18 years**
  - CA: recently lowered age of consent for HPV to 12 yrs
  - OR: age of consent for healthcare services is 15 yrs
  - DC and NC: minors can consent for 'prevention' of an STD

# Adolescent and Parental Attitudes about Consent for Vaccination, 2007 HealthStyles and YouthStyles Surveys

- ❑ **My child should be able to consent without my knowledge to receive a vaccine recommended by their healthcare provider**
  - Strongly disagree/disagree: 70%
  - Neutral: 25%
  - Strongly agree/agree: 14%
  
- ❑ **I should be allowed to get vaccines without permission from my parent**
  - Really/sort of disagree: 72%
  - Really/sort of agree: 28%