

# Public Health Importance of Human Papillomavirus Infection and Disease



Accessible version: <https://youtu.be/Z80AgLojsy0>

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National Center for Chronic Disease Prevention and Health Promotion



U.S. Department of  
Health and Human Services  
Centers for Disease  
Control and Prevention

# Human Papillomaviruses

## ❑ Double-stranded DNA virus

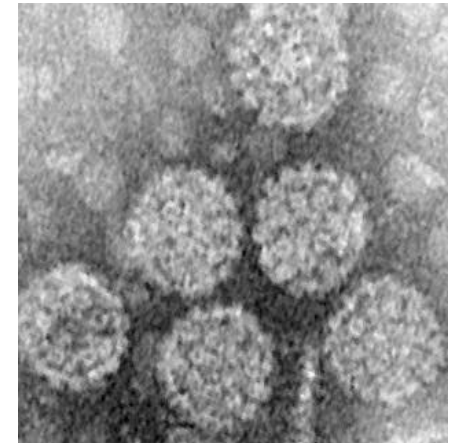
- More than 120 closely related viruses
  - Types numbered in order of discovery

## ❑ HPV infection confined to epithelium

- Begins in base of epithelium, cells proliferate and are not killed

## ❑ Humoral and cellular immune responses identified

- Antibodies detected in less than 70% of females infected



# HPV Types Differ in their Disease Associations

~40 Types

Mucosal/Genital sites of infection

Cutaneous sites of infection

~ 80 Types

**High risk (oncogenic)  
HPV 16, 18**

**Low risk (non-oncogenic)  
HPV 6, 11**

**Cervical cancer other  
anogenital & oropharyngeal  
cancers and cancer precursors  
Low grade cervical disease**

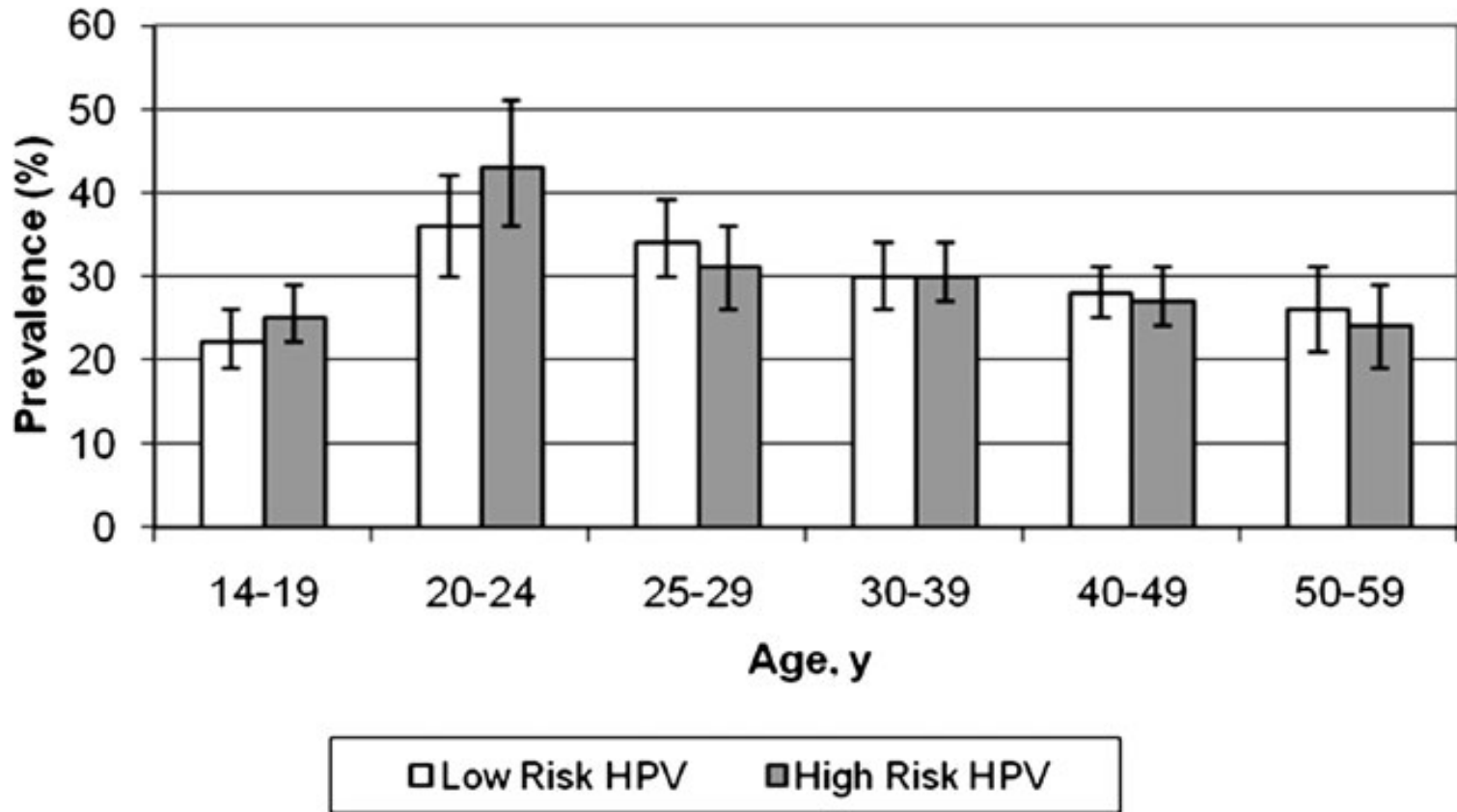
**Genital warts  
Laryngeal papillomas  
Low grade cervical disease**

“Common” hand  
and foot warts

# Overview of HPV Epidemiology and Natural History

- ❑ **HPV infection is very prevalent in the population**
  - Almost all sexually active persons will acquire HPV
  - In the US:
    - ~79 million infected
    - 14 million new infections per year
- ❑ **Genital HPV is first acquired soon after onset of sexual activity**
  - 40% infected within 2 years
- ❑ **Infection is usually transient, asymptomatic**
- ❑ **Cancer is a rare outcome**
  - Requires persistent infection with high risk HPV types

# Weighted Prevalence of HPV in US Women (14-59 years) – NHANES 2003-2006



Hariri S et al. JID 2011;204:566-72

NHANES: National Health and Nutrition Examination Survey

# Burden of Disease Caused by Low-Risk HPV

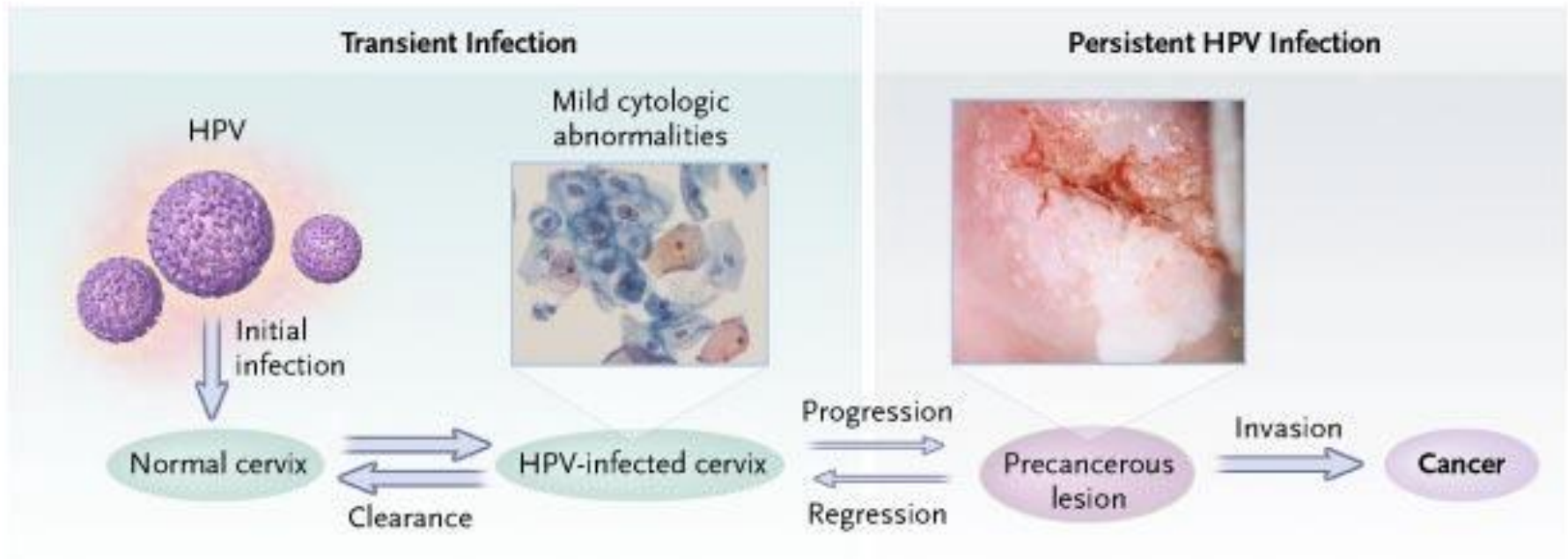
## □ Genital Warts

- Over 300,000 new cases a year in the US
- Peak incidence in persons aged 20-29 years
- Recur 40% of the time and lead to repeat clinical visits, treatments and psychosocial stigma

## □ Recurrent respiratory papillomatosis (RRP)

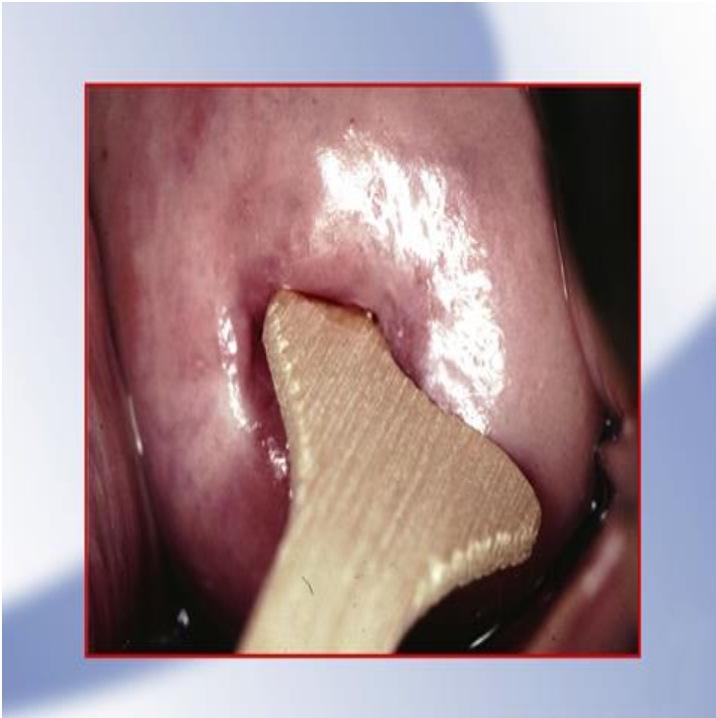
- Rare condition in which warts grow in the throat
- Occur in children (juvenile-onset) and adults (adult-onset)
- Can result in airway obstruction requiring multiple surgeries

# HPV: Natural History of Cervical Infection



- ❑ Persistent infection with high-risk types required for progression to precancer and cancer
- ❑ Peak incidence of precancers in late 20's and of cancers in mid to late 40's

# Cervical Cancer Screening Pap (Papanicolaou) Test



- ❑ A test which collects cells from the surface of the cervix and looks for abnormal cells
- ❑ Precancer can be detected and treated before cervical cancer develops
- ❑ HPV testing added as part of screening, resulting in improved sensitivity while safely allowing for extension of screening intervals



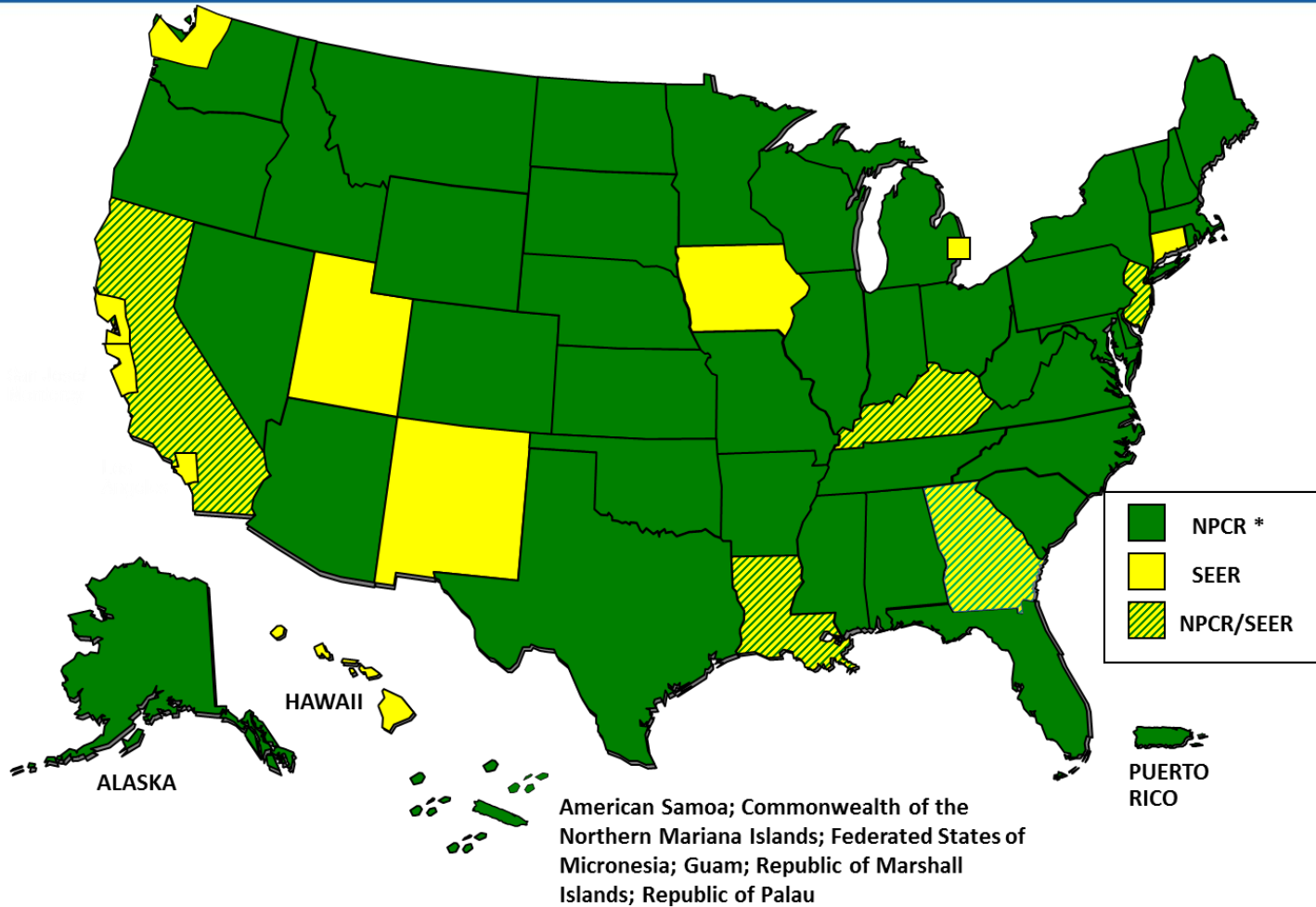
# New Cervical Cancer Screening Guidelines: ACS, USPSTF, ACOG

	<b>ACS 2012</b>	<b>USPSTF 2012</b>	<b>ACOG 2012</b>
Age to start	Age 21 years	Age 21 years	Age 21 years
Women ages 21-29 years	Pap every 3 years	Pap every 3 years	Pap every 3 years
Women ages 30-65 years	Cotesting every 5 years (preferred)  or Every 3 years with Pap alone	Cotesting every 5 years  or Every 3 years with Pap alone	Cotesting every 5 years (preferred)  or Every 3 years with Pap alone
Screening among fully vaccinated	Same as for non- vaccinated	Not reviewed	Same as for non-vaccinated

\*All guidelines recommend that women who have been adequately screened can discontinue Pap at age 65.

ACS: American Cancer Society  
 USPSTF: US Preventive Services Task Force  
 ACOG: American College of Obstetricians and Gynecologists

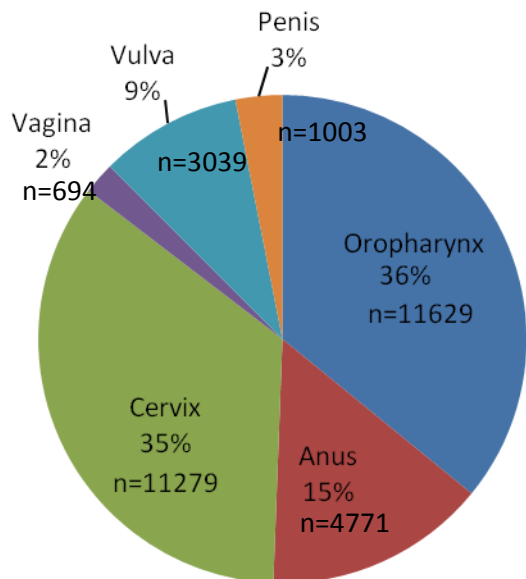
# Federally Funded Cancer Registries, 2013



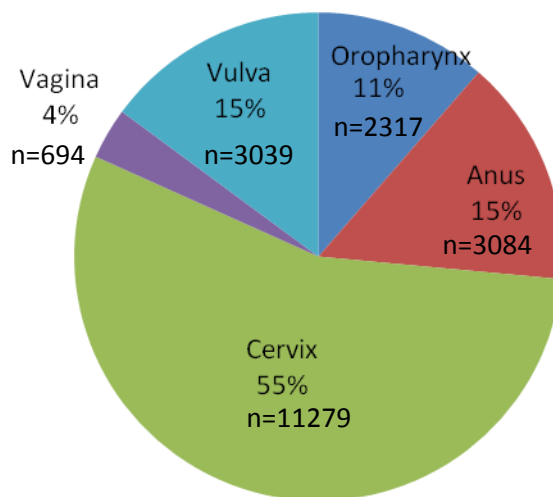
NPCR: National Program of Cancer Registries (CDC)  
SEER: Surveillance, Epidemiology, and End Results Program (National Cancer Institute)

# Average Number of New HPV-associated Cancers Overall, and by Sex, in the United States, 2005-2009

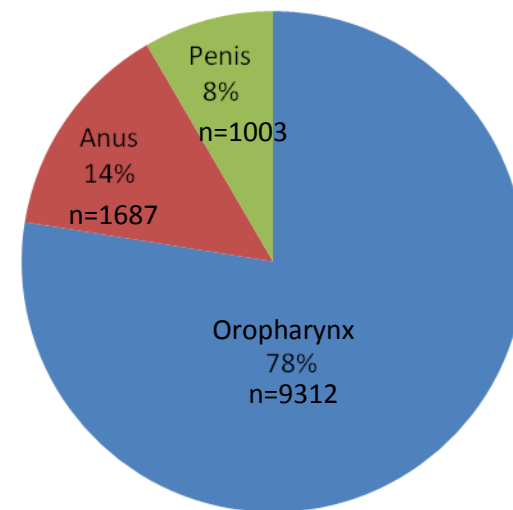
**Total (N=32,415)**



**Women (N=20,413)**



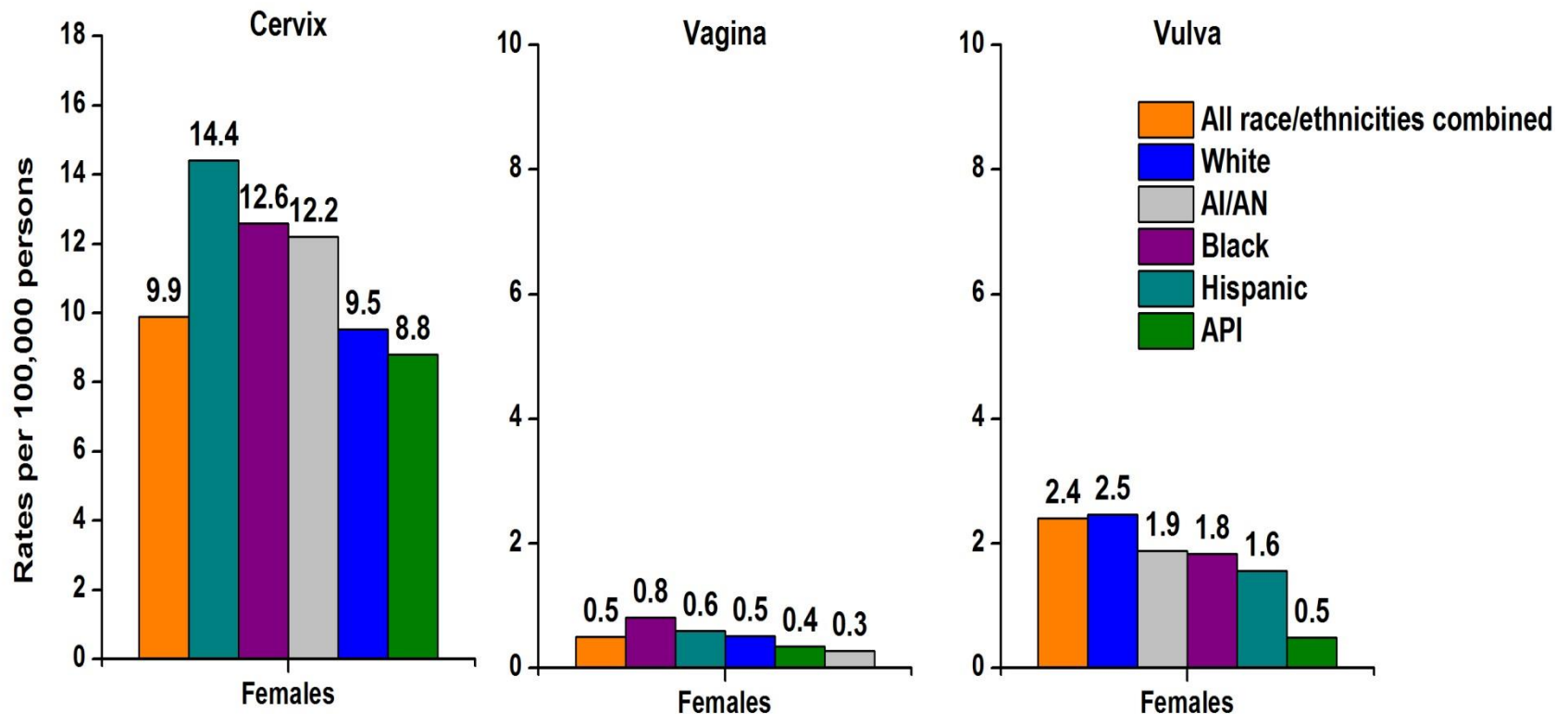
**Men (N=12,002)**



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

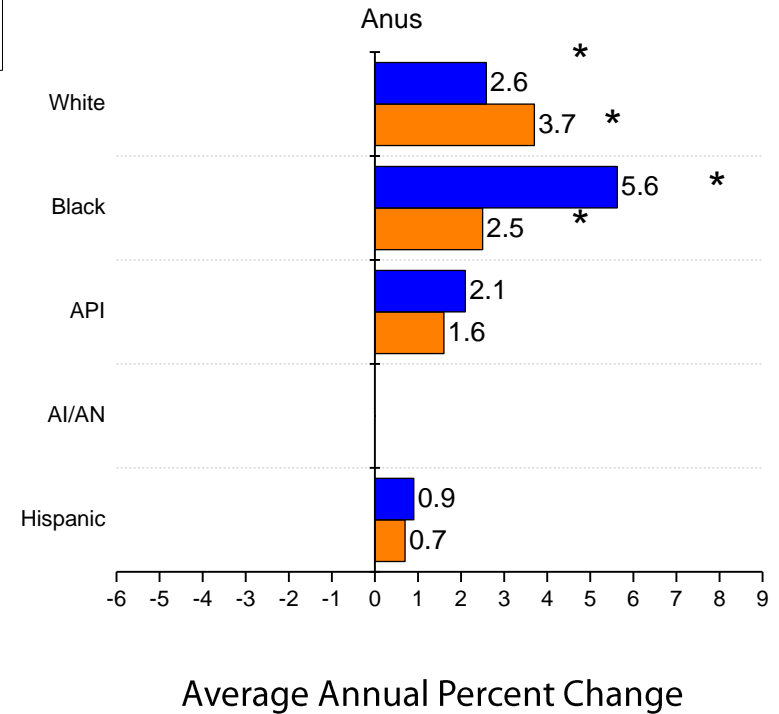
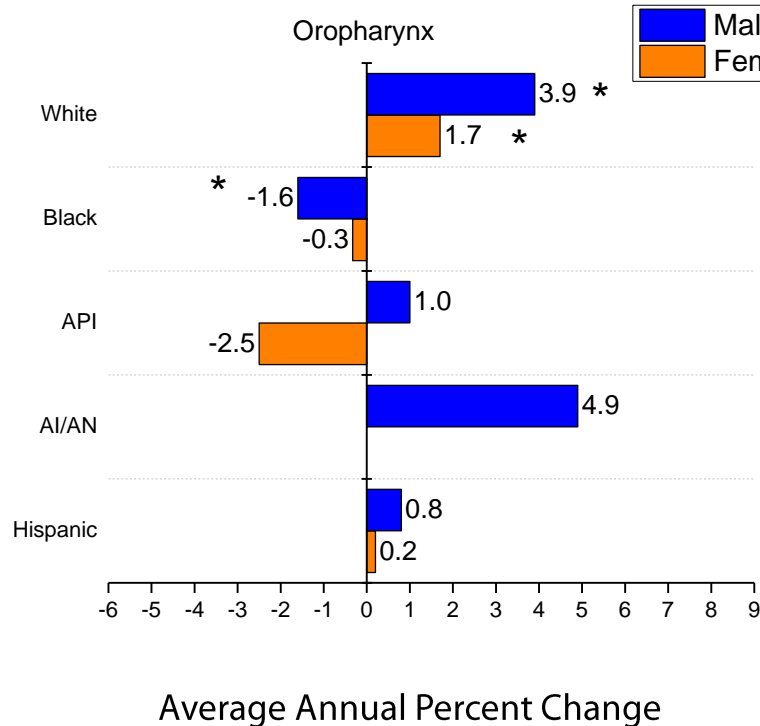
\*In addition: Cervical disease and pre-invasive cancers: CIN1,2,3~ 1.4 million; AIN3~4300; VIN3~27,000, VAIN3~7600 (CDC, unpublished data)

# Cervical, Vaginal and Vulvar Cancers in the United States by Race and Ethnicity, 2005–2009



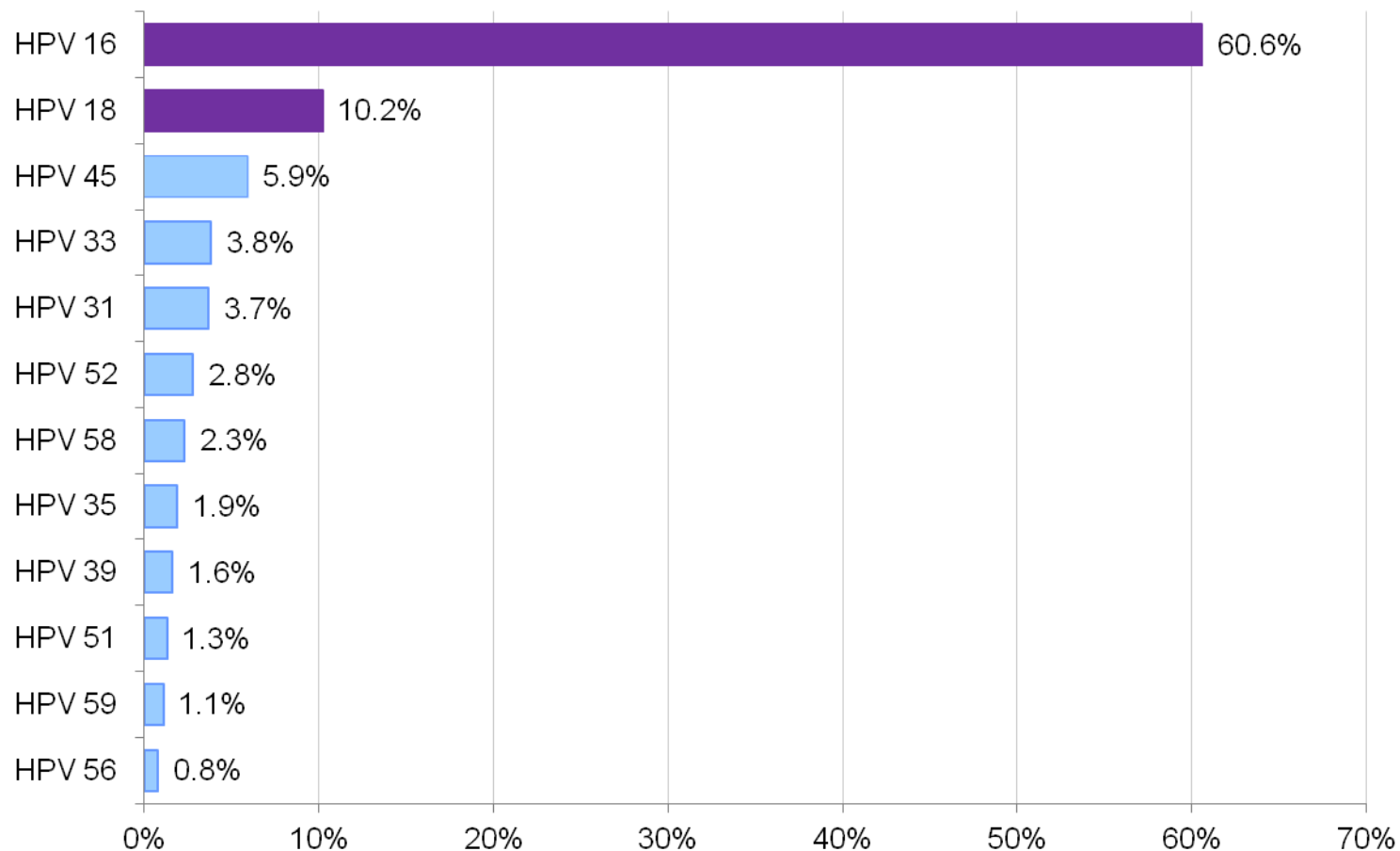
Y axis scale is different for cervical cancer.

# Trends in Oropharyngeal and Anal Cancer by Sex, Race, and Ethnicity in the United States, 2000–2009



\*statistically significantly different from zero at  $P < 0.05$

# Percentage of Cervical Cancers Attributed to HPV types, Worldwide



de Sanjose S et al. Lancet Oncol 2010;11:1048-56

# Percentages of HPV DNA-positive Cancers, United States, 1999-2005

<u>Cancer</u>	Any HPV %	HPV 16/18 %
Cervix	90	66
Vaginal	75	55
Vulvar	69	49
Anal	91	79
Penile	63	48
Oropharyngeal	72	62

HPV attributable cancers = 26,000 cancers

HPV 16/18 attributable cancers= 21,000 cancers

# Annual Cost of HPV-associated Disease, in 2010 U.S. Dollars

Health outcome	Cost (\$ billions)
Cervical cancer screening*	6.6
Cervical cancer	0.4
Other anogenital cancers	0.2
Oropharyngeal cancer	0.3
Anogenital warts	0.3
RRP**	0.2
<b>TOTAL</b>	<b>8.0</b>

\*Cervical cancer screening costs: ~ 80% routine screening, ~20% follow-up

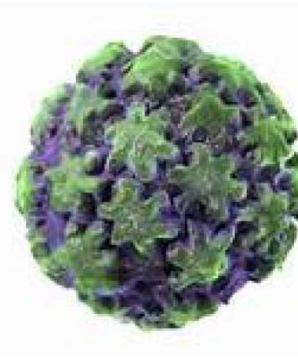
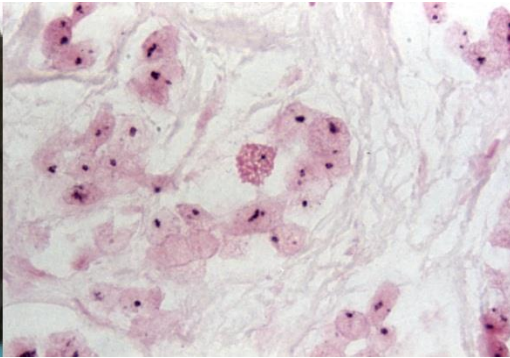
\*\*RRP costs: ~ 70% juvenile-onset, ~ 30% adult-onset



# Summary

- ❑ **HPV is a common infection and cause of malignant and non-malignant diseases**
  - Causes cancer at a variety of anatomic sites
- ❑ **Outcomes are burdensome, costly and stigmatizing**
- ❑ **Approximately 26,000 HPV-attributable cancers**
  - 21,000 are vaccine preventable
  - Trends for anal and oropharyngeal cancers increasing
  - Racial and ethnic disparities exist
- ❑ **Cervical cancer screening guidelines**
  - Newly harmonized
  - Unchanged for vaccinated individuals, but may change in future

# Overview of HPV Vaccines and Impact Monitoring



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National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention

# HPV Vaccines Licensed by FDA

	Quadrivalent (Gardasil®)	Bivalent (Cervarix®)
Manufacturer	Merck	GlaxoSmithKline
VLP types	6, 11, 16, 18	16, 18
Licensed in US	Females -2006 Males -2009	Females - 2009
Schedule in months from first vaccination	0, 1-2, 6	0, 1-2, 6

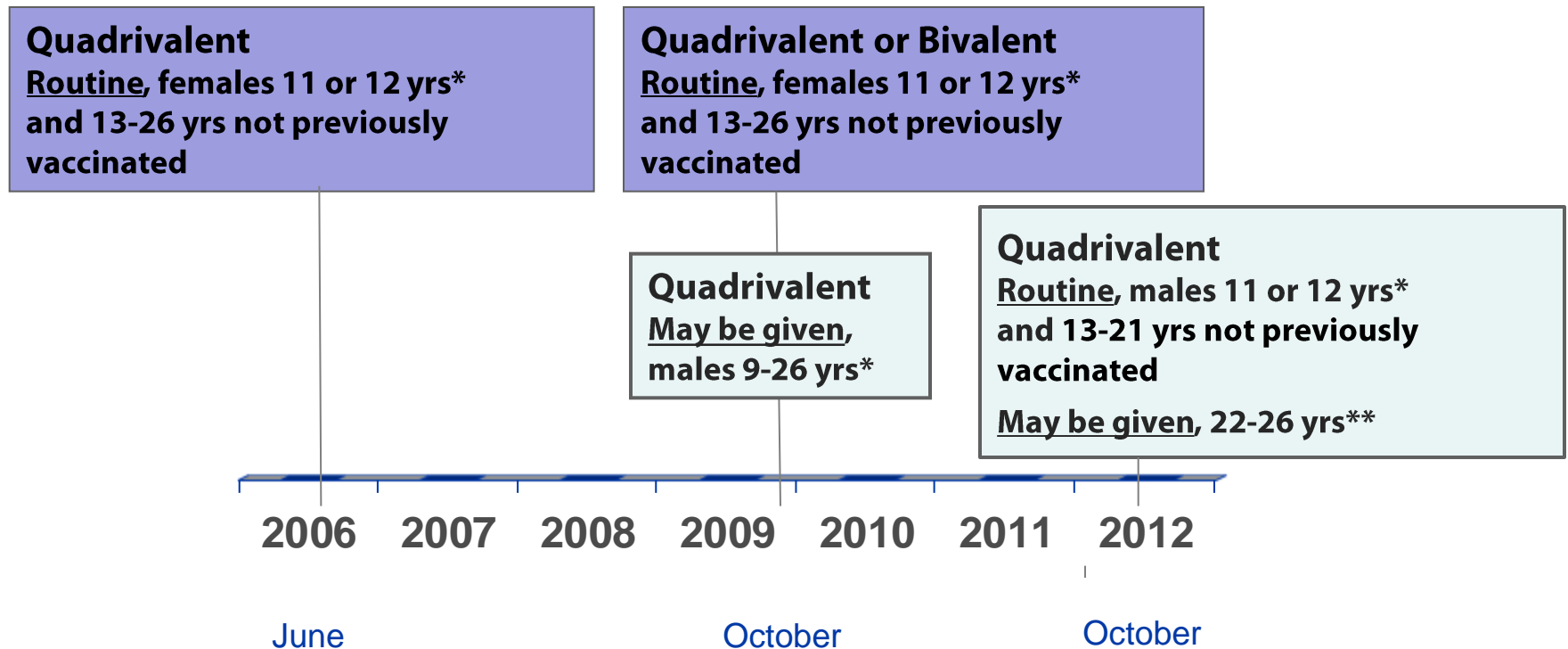
# HPV Vaccine Efficacy in Randomized Controlled Trials

Outcome	Vaccine	Sex	Vaccine Efficacy
Cervical precancer	Bivalent and Quadrivalent	F	>92%
Vaginal/Vulvar precancer	Quadrivalent	F	100%
Anal precancer	Quadrivalent	M	75%
Genital warts	Quadrivalent	F, M	>89%

## No evidence of efficacy against existing HPV infection or disease

Paavonen J et al. Lancet 2009;374:301-14, Kjaer S et al. Cancer Prev Res 2009;2:868-78, Hildesheim A et al. JAMA 2007;298:743-53, Future I/II Study Group, BMJ 2010;341, The Future II Study Group Lancet 2007;369:1861-8, Palefsky J et al. NEJM 2011;365:1576-85  
Gardasil Package Insert, page 504 Table 12

# Evolution of Recommendations for HPV Vaccination in the U.S.



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

# Current ACIP HPV Vaccine Recommendations

## Females and Males

- ❑ **Routine vaccination of females aged 11 or 12 years with 3 doses of either bivalent or quadrivalent HPV vaccine**
  - Also for 13 through 26 year olds who have not been vaccinated previously or who have not completed the 3-dose series
- ❑ **Routine vaccination of males aged 11 or 12 years with 3 doses of quadrivalent HPV vaccine**
  - Also for 13 through 21 year olds who have not been vaccinated previously or who have not completed the 3-dose series
  - Gay, bisexual and other men who have sex with men are recommended to receive vaccine through age 26 years

# Monitoring of HPV Vaccines

Objectives	Methods	Examples
Vaccine Safety	Surveillance and Research	VAERS, VSD, CISA
Vaccine Impact on Infection and Disease Burden	Surveillance and Research	NHANES, Administrative data HPV-IMPACT, Cancer Registries
Vaccine Coverage	National Surveys, Registries	NIS-Teen, Immunization Registries
Behaviors and Attitudes	National Surveys	NSFG, NHANES

VAERS: Vaccine Adverse Event Reporting System  
VSD: Vaccine Safety Datalink  
NHANES: National Health and Nutrition Examination Survey  
NIS-Teen: National Immunization Survey, Teen Component  
NSFG: National Survey of Family Growth

# Post-licensure Vaccine Safety Monitoring: Rationale

- ❑ **High safety standards expected for vaccines**
  - Products given to healthy populations for prevention of disease
- ❑ **Pre-licensure trials are often too small to detect rare events and special populations may not be adequately represented**
- ❑ **Critical to maintain public confidence in immunization, provide timely information**



# Post-licensure Vaccine Safety Systems

## ❑ Vaccine Adverse Event Reporting System (VAERS)

- Collaboration between CDC and FDA
  - National spontaneous reporting system
  - Can detect potential vaccine safety concerns (signals) but not designed to assess causality

## ❑ Vaccine Safety Datalink (VSD)

- Collaboration between CDC and 9 managed care organizations
  - ~9.2 million insured members under active surveillance annually
  - Rates, risks estimates calculated
  - Near real time evaluation through Rapid Cycle Analysis (RCA)

## ❑ Clinical Immunization Safety Assessment (CISA)

- Collaboration between CDC and 7 academic medical centers
  - For clinically complex vaccine adverse events and research on biologic mechanisms

# Summary of VSD Safety Evaluation of HPV Vaccine

## □ Findings from the VSD RCA:

- Among 600,588 doses of quadrivalent vaccine administered to females 9-26 years, no significant increased risk for any of the pre-specified adverse events after vaccination:
  - Guillain-Barré syndrome, seizures, syncope, appendicitis, stroke, venous thromboembolism, anaphylaxis and other allergic reactions

## □ Total doses of quadrivalent HPV vaccine administered through January 2013 within VSD:

- > 2.07 million doses
  - ~270K doses of quadrivalent HPV vaccine given to males

# Impact on Biologic Outcomes - What is Vaccine-Preventable?

- ❑ **Cancers: 70% of cervical and ~90% of non-cervical HPV associated cancers are potentially preventable by either vaccine**
  - ~21,000 cancer cases each year
- ❑ **Cervical Pap test abnormalities: 30-70% are potentially preventable by either vaccine**
  - ~1 million cervical Pap test abnormalities each year
- ❑ **Genital warts: 90% of genital warts preventable by quadrivalent vaccine**
  - ~ 325,000 genital warts cases each year

# Monitoring Impact on Biologic Outcomes: Current Activities

## ❑ Surveillance and research to monitor different outcomes

- Early, mid, late measures
- National, regional, state
- General, other populations

## ❑ Vaccine effectiveness studies

## ❑ Laboratory evaluations

- HPV type-specific prevalence for various outcomes
- U.S. population, precancers, cancers

## ❑ Challenges

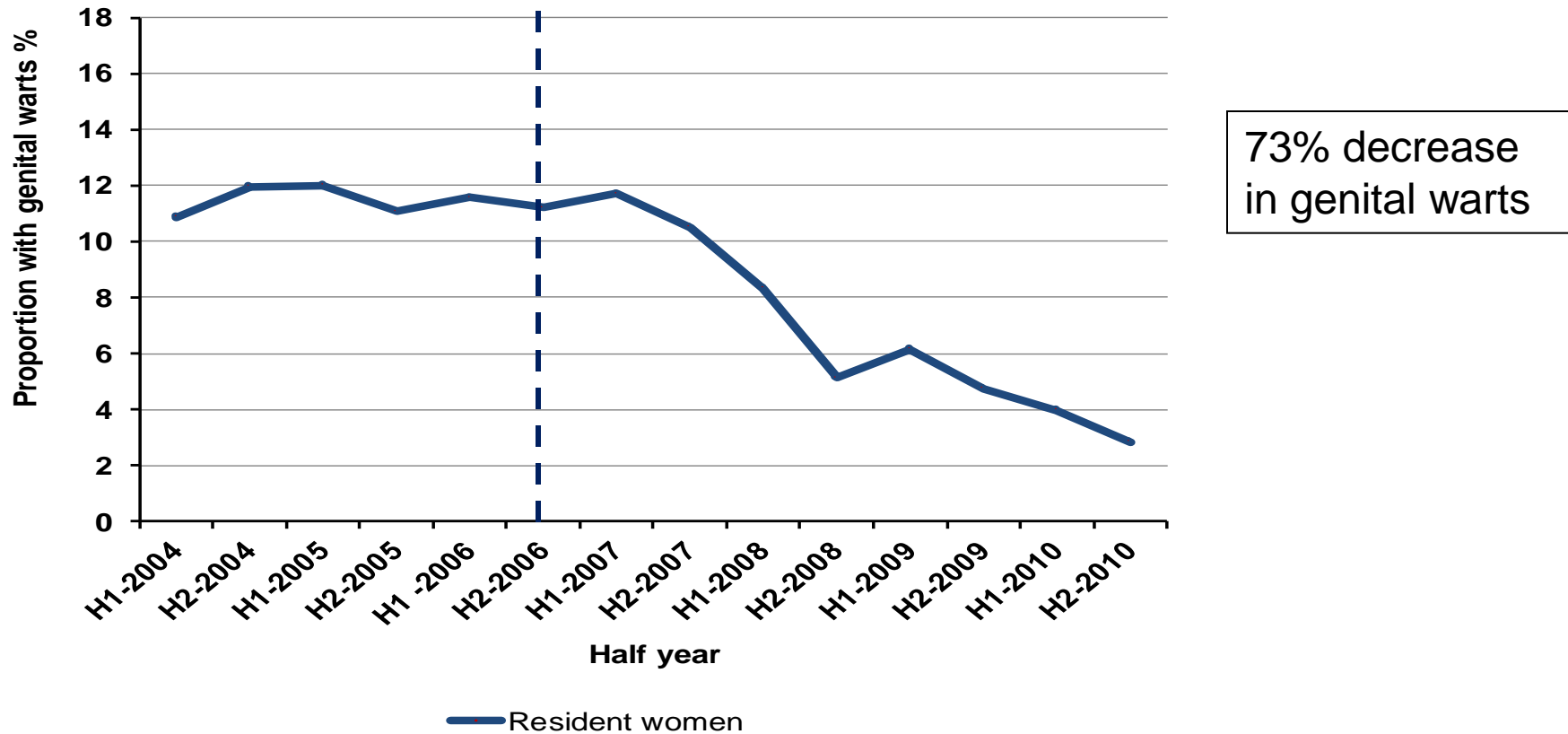
- Most outcomes not nationally reportable, many outcomes dependent on cervical cancer screening, varied stakeholder, laboratory testing

# Monitoring Impact on Biologic Outcomes: Current Activities

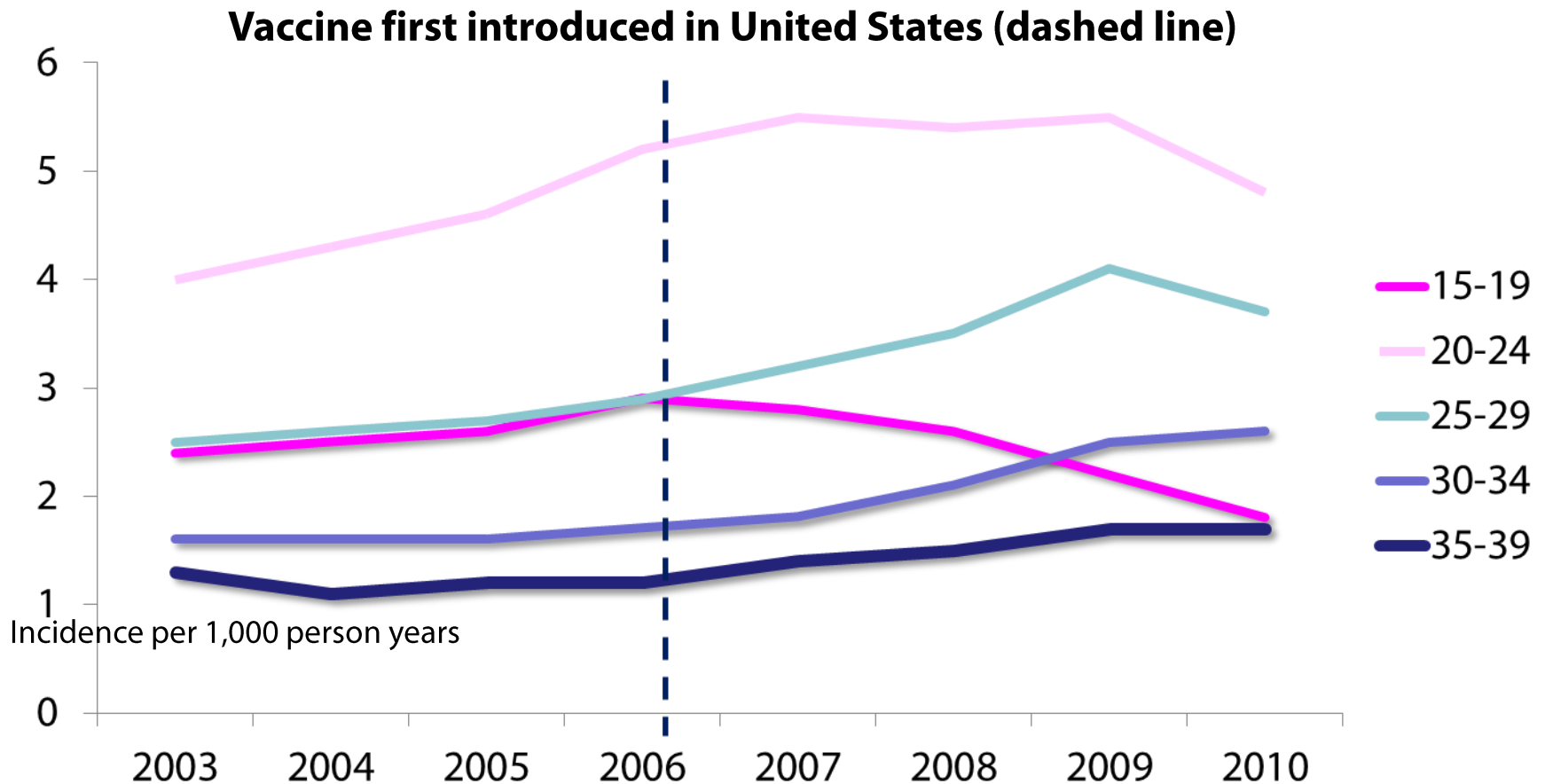
Timeframe	System/study	Outcome
Early	NHANES	HPV type specific prevalence
	Administrative data	Genital warts
Mid	Select cancer registries	Cervical precancers
	HPV-IMPACT	
Late	Cancer registries	Cervical and other HPV-associated cancers

# Proportion of Women Aged <26 Years with Genital Warts, 2004-2010, Australia

Vaccine first introduced in Australia in 2006 (dashed line)



# Genital Warts, Females 2003-2010 by Age Group, U.S. MarketScan® Database



# Summary

## □ HPV Vaccines

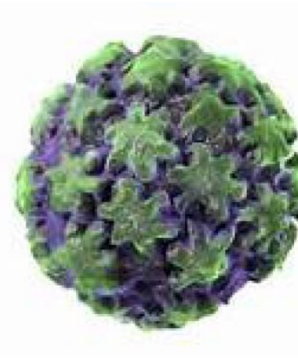
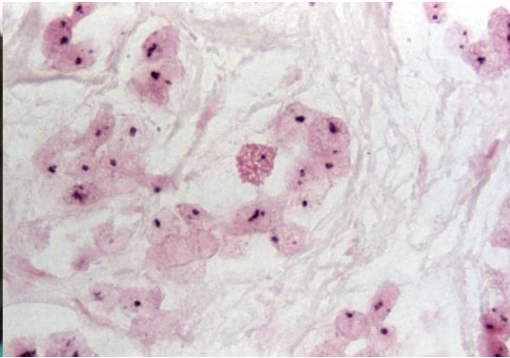
- Bivalent and quadrivalent vaccines are safe and effective
- Potential to prevent large burden of cancers and diseases

## □ Monitoring

- Ongoing monitoring is important for vaccine program and policy
  - Safety surveillance
  - Biologic outcomes
    - Special evaluations: e.g. effectiveness of less than 3 vaccine doses
- Early in timeline to measure impact on some biologic outcomes
  - Evidence of impact on genital warts
- Increasing HPV vaccine coverage important to reduce cancers and diseases



# U.S. HPV Vaccination Program: Progress and Challenges



**Shannon Stokley, MPH**

*Acting Associate Director of Science*

Immunization Services Division

National Center for Immunization and Respiratory Diseases

# Overview

- ❑ **Describe U.S. vaccination program**
- ❑ **Review HPV vaccination coverage levels**
- ❑ **Summarize factors contributing to less than optimal vaccination coverage**

# U.S. HPV Vaccination Program

- ❑ **HPV is one of several vaccines recommended for the adolescent age group (“adolescent platform”)**
  - Tdap, MCV4, annual influenza
- ❑ **Majority (83%) of vaccines are administered in primary care provider offices and publicly funded clinics (FQHC, RHC)**
  - Vaccines often administered during preventive healthcare visits
- ❑ **National survey 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**

Daley M et al. Pediatrics 2010;126:425-33

Tdap: tetanus, diphtheria, and acellular pertussis vaccine

MCV4: quadrivalent meningococcal conjugate vaccine

FQHC: federally qualified health center

RHC: rural health clinic

# Vaccines For Children (VFC) Program

- ❑ **Federal legislation enacted in 1994 to remove cost as a barrier to vaccination**
- ❑ **Provides federally purchased vaccines recommended by ACIP at no cost to eligible children 18 years and younger:**
  - Medicaid eligible
  - Uninsured
  - American Indian/Alaska Native descent
  - Underinsured (if vaccinated at an FQHC or RHC)
- ❑ **In 2011, 39.4% of adolescents 13-17 years of age were eligible for VFC vaccine**
- ❑ **~44,000 immunization providers enrolled in VFC**

<sup>1</sup>2011 National Immunization Survey-Teen available at <http://www.cdc.gov/vaccines/stats-surv/nis/nis-2011-released.htm#nisteent>

<sup>2</sup>2010 VFC Program Management Survey available at: <http://www2a.cdc.gov/nip/irar/grantee/vfcprovider10.asp>

ACIP: Advisory Committee on Immunization Practices

FQHC: federally qualified health center

RHC: rural health clinic

# National Immunization Survey-Teen (NIS-Teen)

## ❑ Annual survey

- Implemented in 2006
- State level estimates available beginning 2008

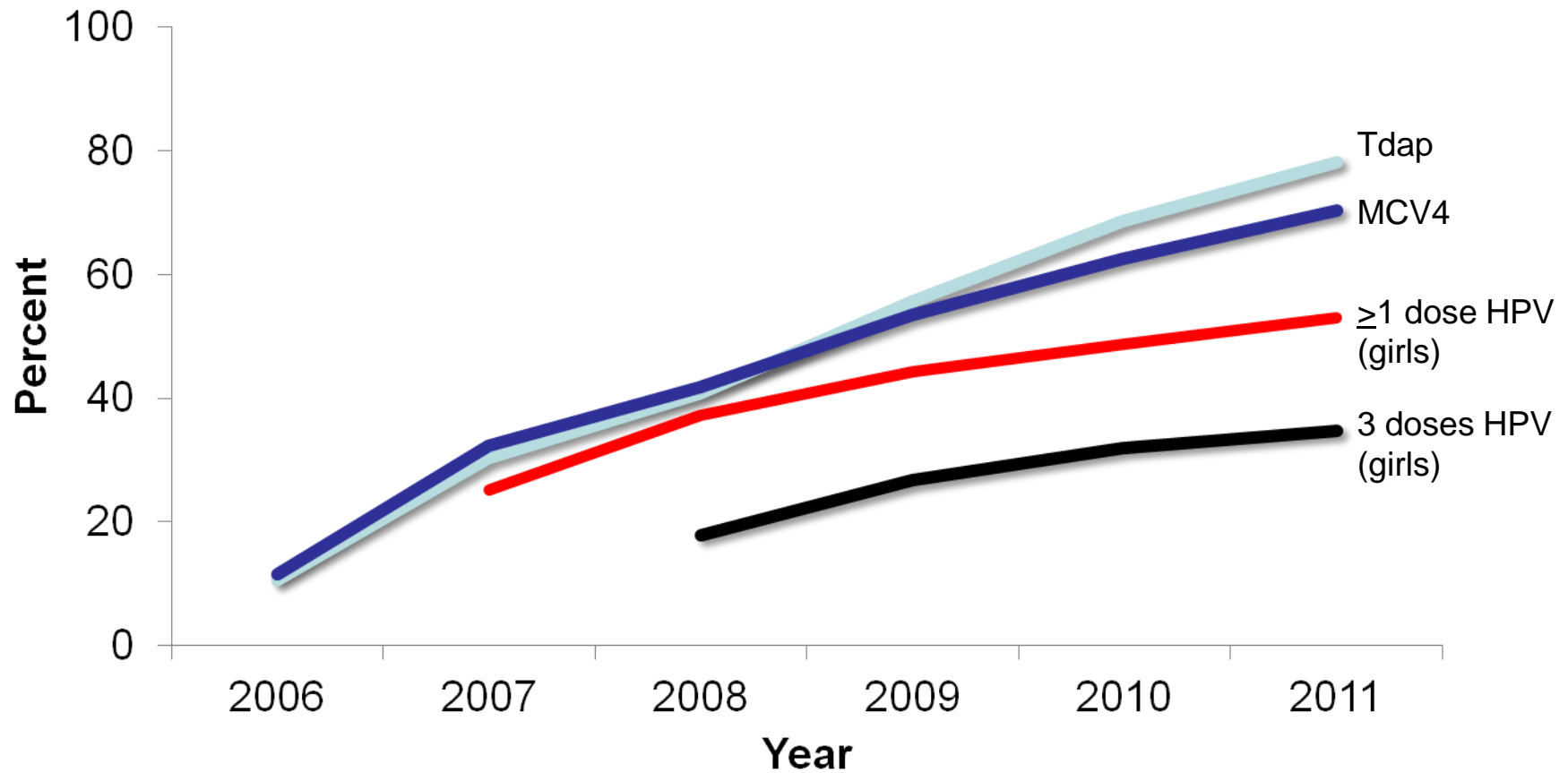
## ❑ Uses National Immunization Survey (NIS) sample frame methodology

- Random digit dial telephone survey
- National sample of parents of adolescents aged 13-17 years
- Provider record check for verification of immunizations received

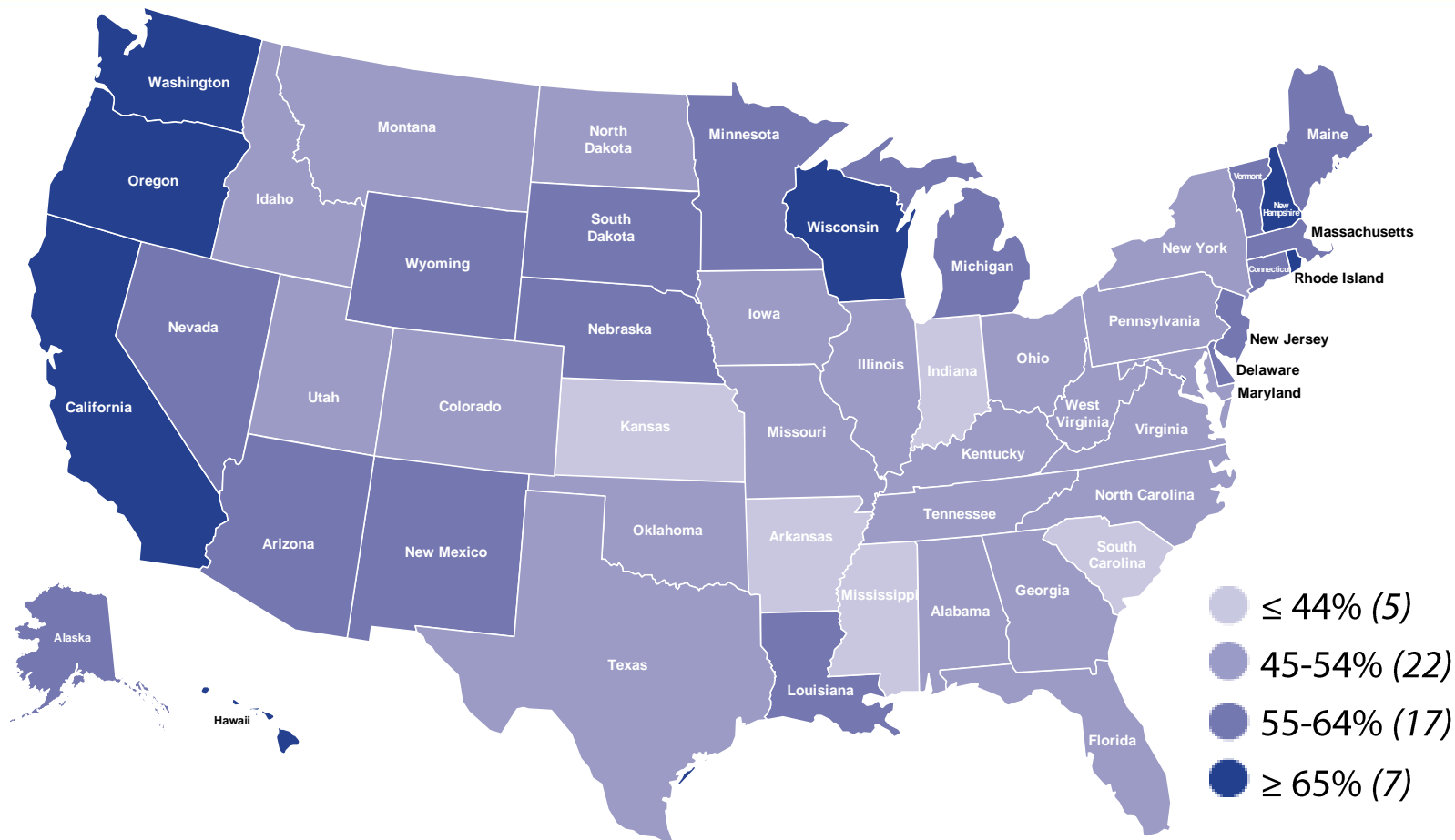
## ❑ All analyses limited to adolescents with provider reported immunization histories

Additional information about the NIS-Teen available at: <http://www.cdc.gov/vaccines/stats-surv/nis/default.htm#nisteent>

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



# Coverage of 1 of More Doses of HPV among Adolescent Girls 13-17 Years by State, NIS-Teen 2011

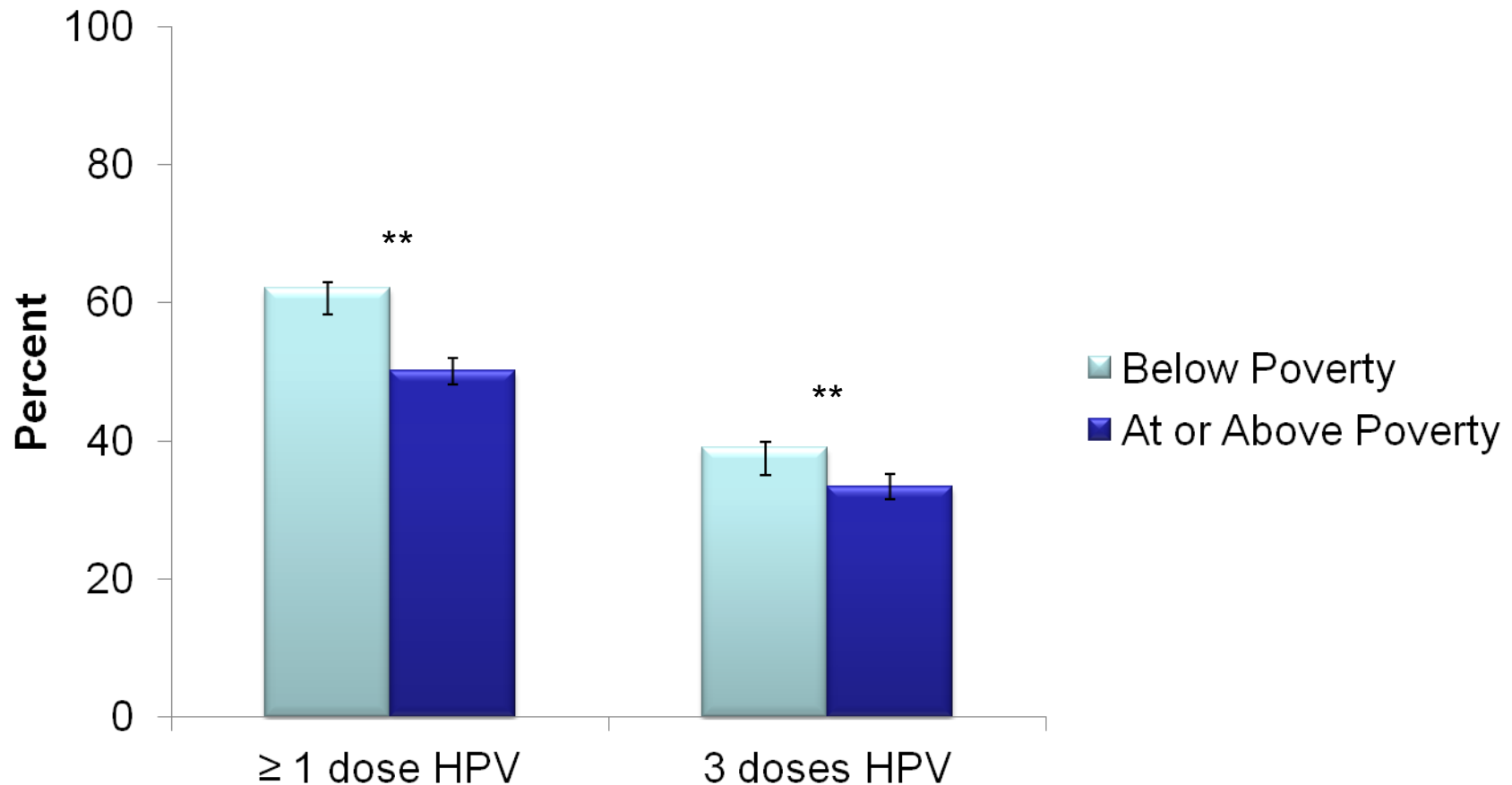


Note 1: Human Papillomavirus Vaccine, either quadrivalent or bivalent.

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

2011 NIS-Teen available at <http://www.cdc.gov/vaccines/stats-surv/nis/nis-2011-released.htm#nisteen>

# Vaccination Estimates among Adolescent Girls 13-17 Years by Poverty Status, NIS-Teen 2011

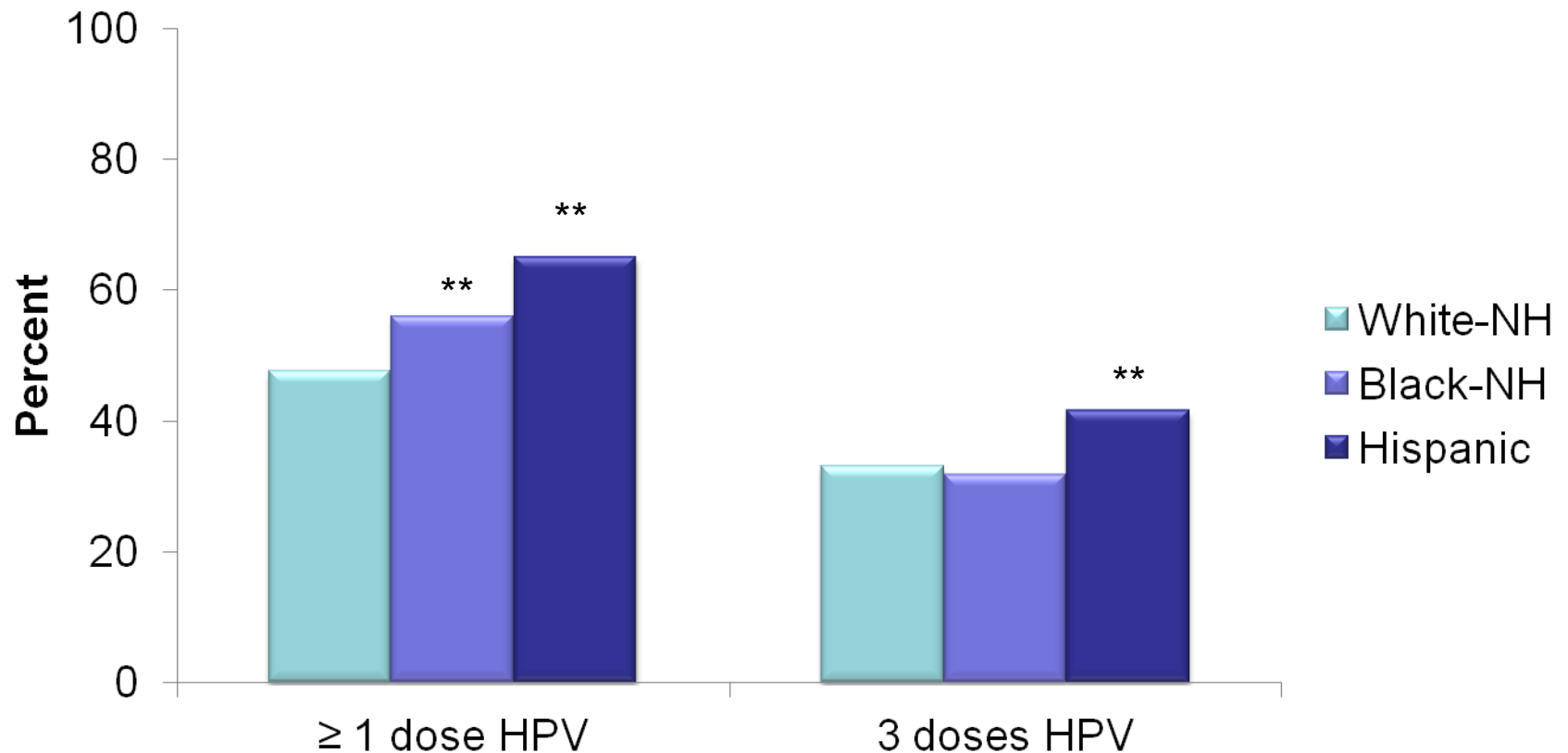


\*\* statistically significant ( $p < 0.05$ )

2011 NIS-Teen available at <http://www.cdc.gov/vaccines/stats-surv/nis/nis-2011-released.htm#nisteent>



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



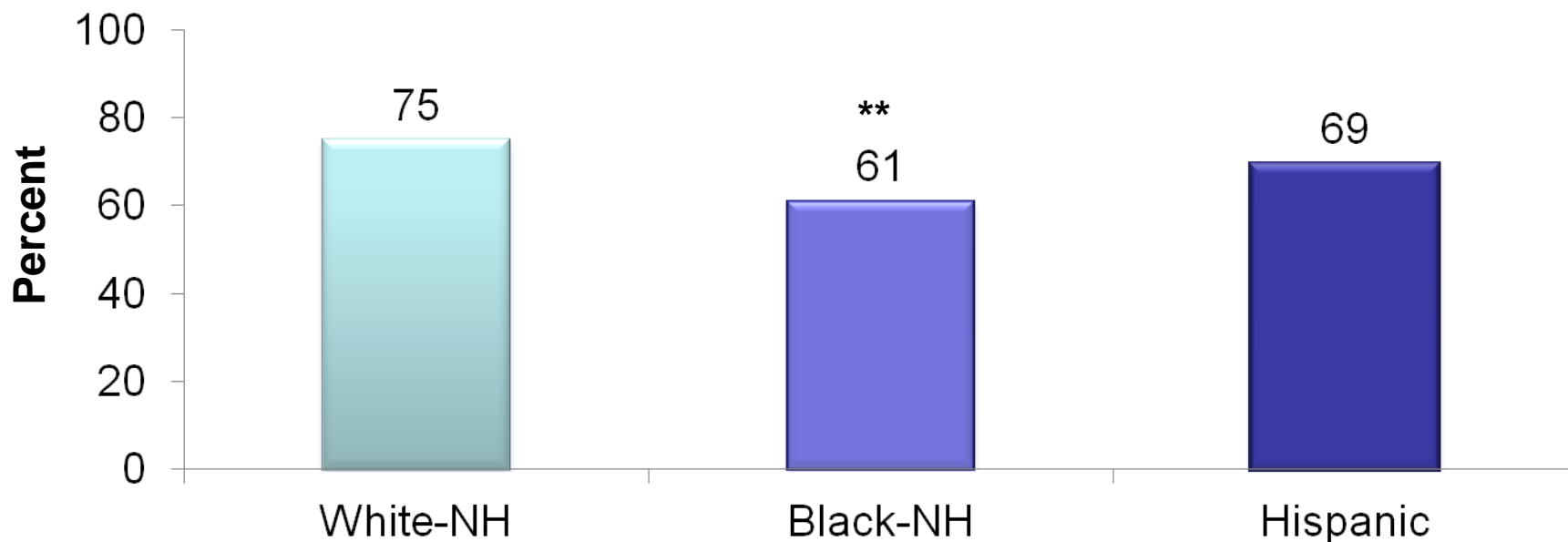
\*\* statistically significant ( $p < 0.05$ )

2011 NIS-Teen available at <http://www.cdc.gov/vaccines/stats-surv/nis/nis-2011-released.htm#nisteent>

# Completion of the HPV Series among Adolescent Girls 13-17 Years by Race/Ethnicity, NIS-Teen 2011

## □ Completion: among the girls who started the series, the proportion that received all 3 doses

- Nationally, 71% of girls that start the HPV series, complete the series
- In contrast, population-wide 3-dose coverage was 35% in 2011



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

NH: non-Hispanic

2011 NIS-Teen available at <http://www.cdc.gov/vaccines/stats-surv/nis/nis-2011-released.htm#nisteent>

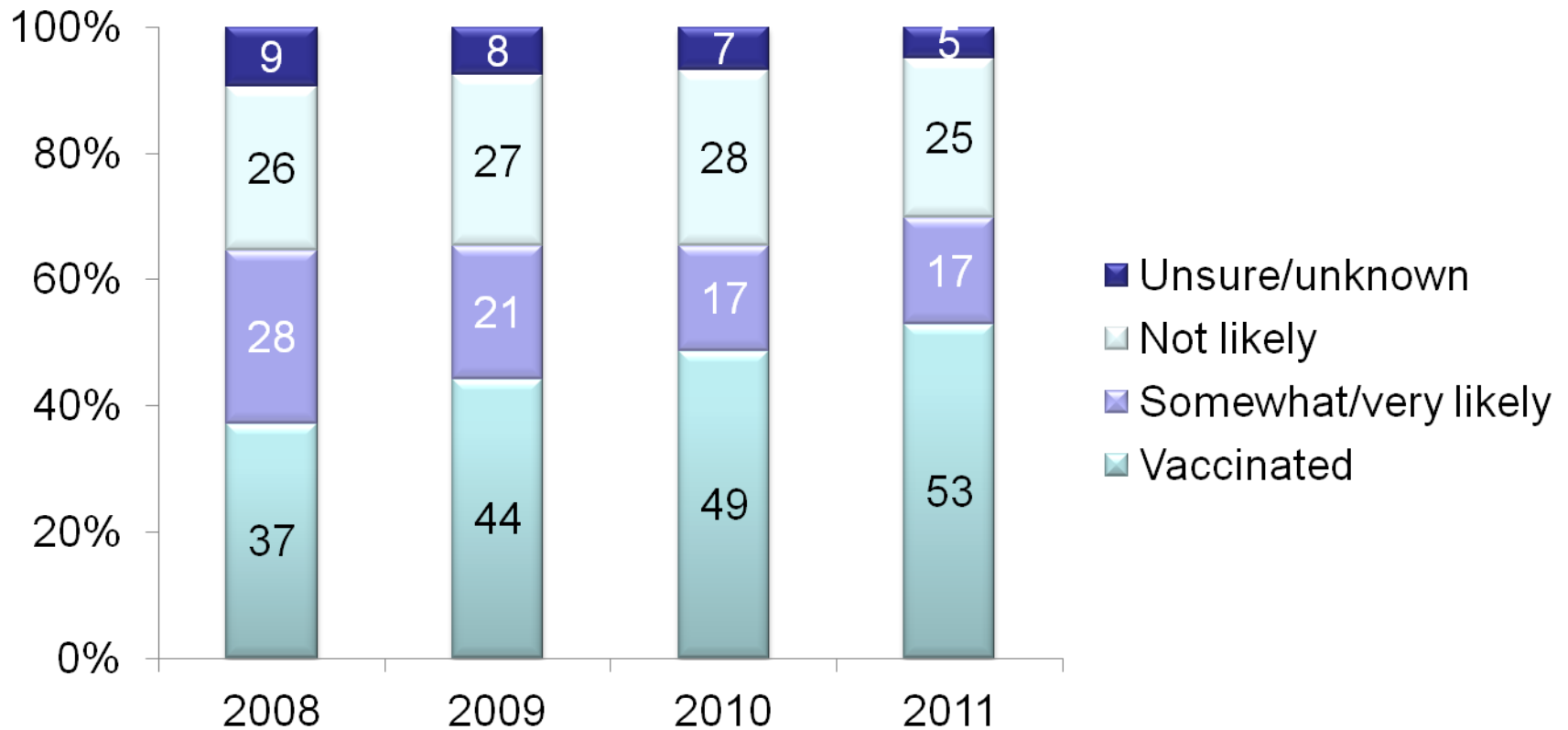
# HPV Vaccination Uptake among Adolescent Boys

- ❑ **Available data represents vaccination activities prior to implementation of routine recommendation approved in October, 2011**
- ❑ **8.3% of boys 13-17 years of age have initiated the series**
- ❑ **So far vaccine uptake (coverage) follows the same pattern as observed for girls**
  - Higher coverage among boys living below the poverty level
  - Higher coverage among Black and Hispanic boys
  - Based on only one year of data

# Challenges in Achieving High Levels of HPV vaccination

- ❑ **Parental attitudes and vaccine intentions**
- ❑ **Provider attitudes and practices**

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



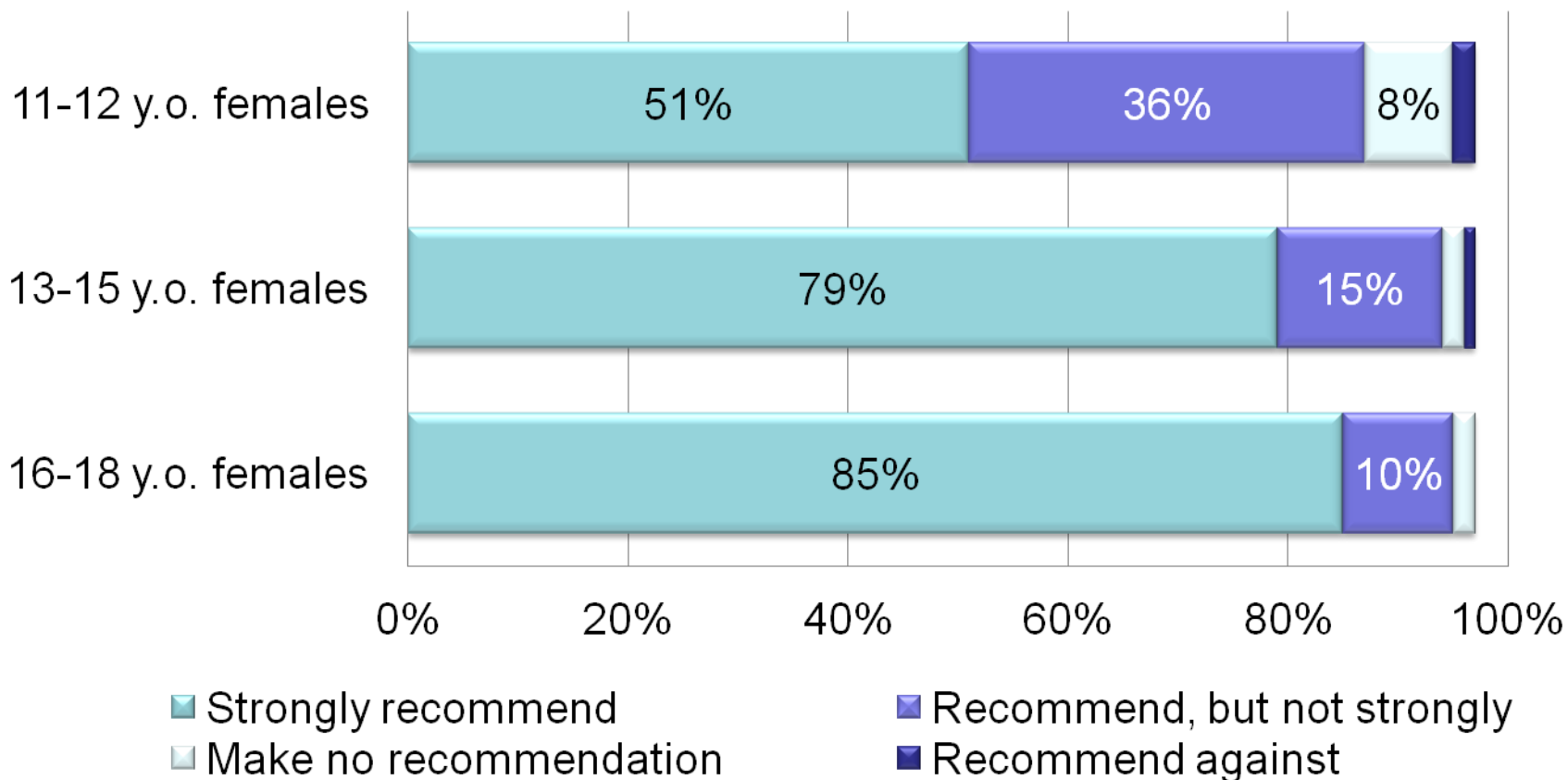
NIS-Teen available at <http://www.cdc.gov/vaccines/stats-surv/nis/default.htm#nisteent>

# Most Common 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%
No recommendation by provider	9.6%

Response categories are not mutually exclusive

# Strength of HPV Vaccine Recommendation for Female Patients, Pediatricians and Family Physicians (N=609)



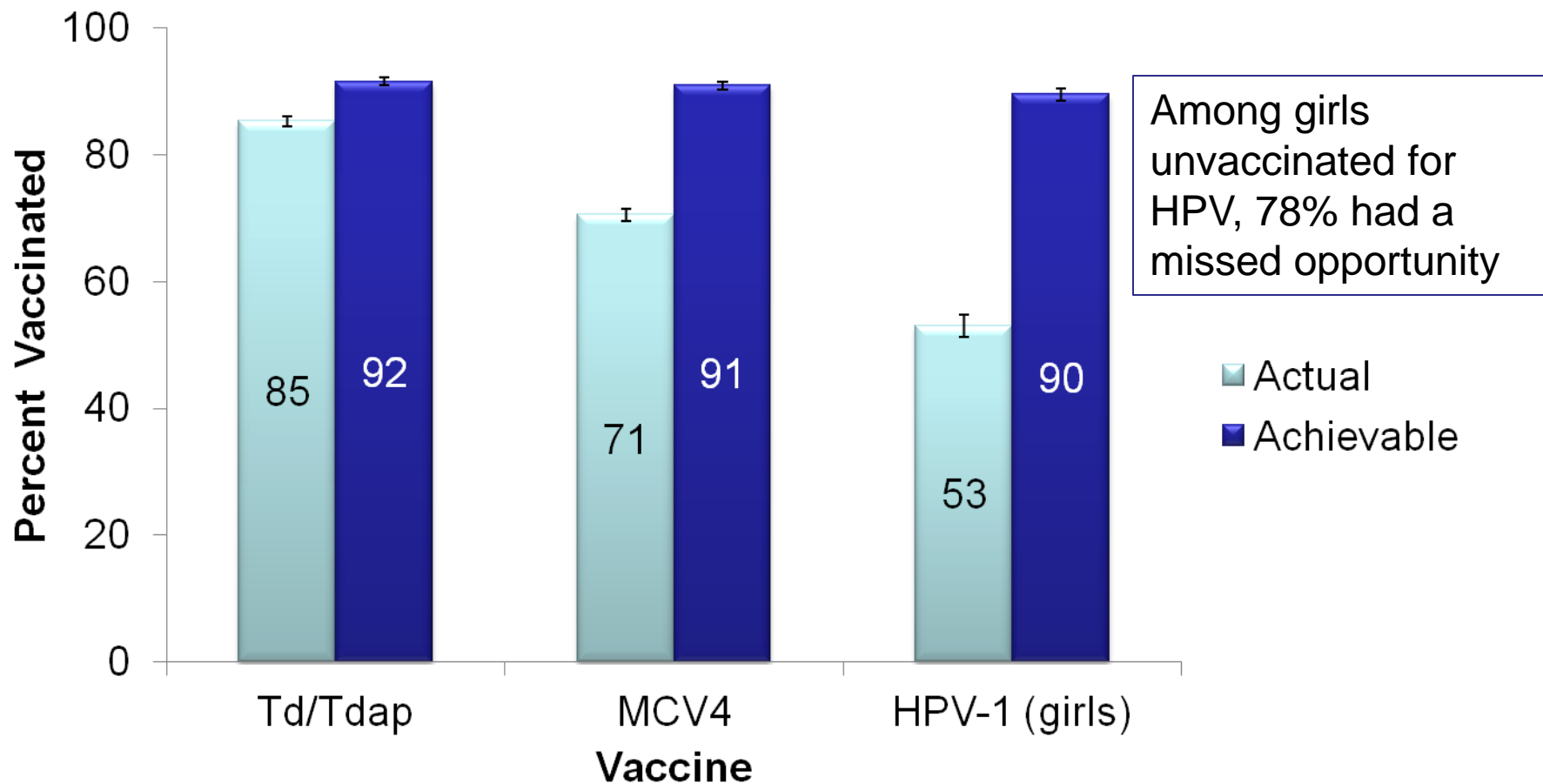
Allison et al. <https://cdc.confex.com/cdc/nic2011/webprogram/Paper25181.html>

# HPV Vaccine Communications During the Healthcare Encounter

- ❑ **HPV vaccine is often presented as 'optional' whereas other adolescent vaccines are recommended**
- ❑ **Some expressed mixed or negative opinions about the 'new vaccine' and concerns over safety/efficacy**
- ❑ **When parents expressed reluctance, providers were hesitant to engage in discussion**
- ❑ **Some providers shared parents' views that teen was not at risk for HPV and could delay vaccination until older**



# Actual and Achievable Vaccination Coverage if Missed Opportunities were Eliminated: Adolescents 13-17 Years, NIS-Teen 2011

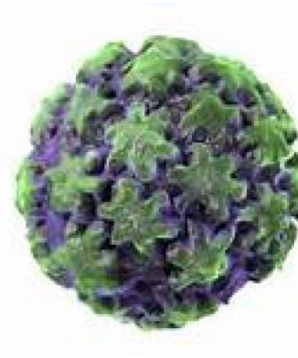
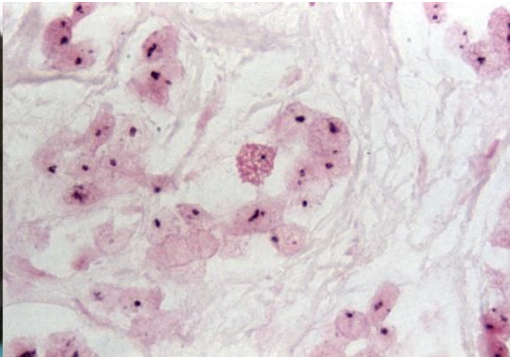


Missed opportunity: encounter when some but not all ACIP-recommended vaccines are given  
HPV-1: receipt of at least one dose of HPV  
2011 NIS-Teen available at <http://www.cdc.gov/vaccines/stats-surv/nis/nis-2011-released.htm#nisteenteen>

# Summary

- ❑ **HPV vaccination coverage among U.S. adolescent girls is increasing, but slowly**
  - Vaccination uptake varies by state
- ❑ **Efforts are needed to achieve high HPV coverage and subsequent HPV disease prevention:**
  - Address provider and parent attitudes towards HPV vaccination
  - Improve communication skills among primary care providers
  - Implement evidence based strategies (e.g. reminder/recall, coverage assessment and feedback) to reduce missed opportunities

# What Is Needed to Increase HPV Vaccine Coverage?



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Houston, Texas

# Disclosure

- ❑ **Dr. Middleman's institution receives grants from Novartis and the Society for Adolescent Health and Medicine**

# Increasing HPV Vaccine Coverage

- ❑ **Adolescent platform**
  - A specific time period during which there is an expectation of vaccine completion
- ❑ **Public policy strategies**
- ❑ **Provider strategies**
  - Practice strategies
  - Provider communication

# ACIP Adolescent Immunization Schedule ("Adolescent Platform")

Vaccines	11-12 yrs	13-15 yrs	16-18 yrs
HPV	3-dose series		
Tdap	1 dose		
MCV4	1 <sup>st</sup> dose		booster
Influenza	Annual immunization		



Range of recommended ages for all children



Range of recommended ages for catch-up immunization

Tdap: tetanus, diphtheria, and acellular pertussis vaccine

MCV4: meningococcal conjugate vaccine

ACIP: Advisory Committee on Immunization Practices

# Building an Adolescent Immunization Platform

- ❑ **Focuses on disease prevention and health promotion among this age group**
- ❑ **Presents opportunities for improved comprehensive care that includes other health issues (e.g., screening and prevention of risk behaviors)**
- ❑ **Creates parental and provider expectation of adherence to established adolescent vaccine recommendations**



# Increasing HPV Vaccine Coverage

- ❑ **Adolescent platform**
- ❑ **Public policy strategies**
- ❑ **Provider strategies**
  - Practice strategies
  - Provider communication



# Policy Approaches to Support Adolescent Immunization

- ❑ **State legislative efforts for school requirements and education**
- ❑ **Utilization of alternative immunization sites**
- ❑ **Health insurance reform**

# Current State Legislation

## □ Middle School requirements

- Vaccination: Td/Tdap: 41 states; MCV4: 13 states;
- HPV (vaccination): 2 (DC, VA)
- HPV (education): 7 states (WA, LA, NC, MI, IA, TX, IN)

## □ General state legislation related to HPV vaccine:

- Education of parents/general public (n=14 states)

## □ Study of state requirements and coverage

- School requirements: For Tdap and MCV4 - significantly higher coverage compared with states no requirements
- Education requirements: for HPV and MCV4, no difference compared with states with no requirements

# Alternative Immunization Sites and Potential Benefits

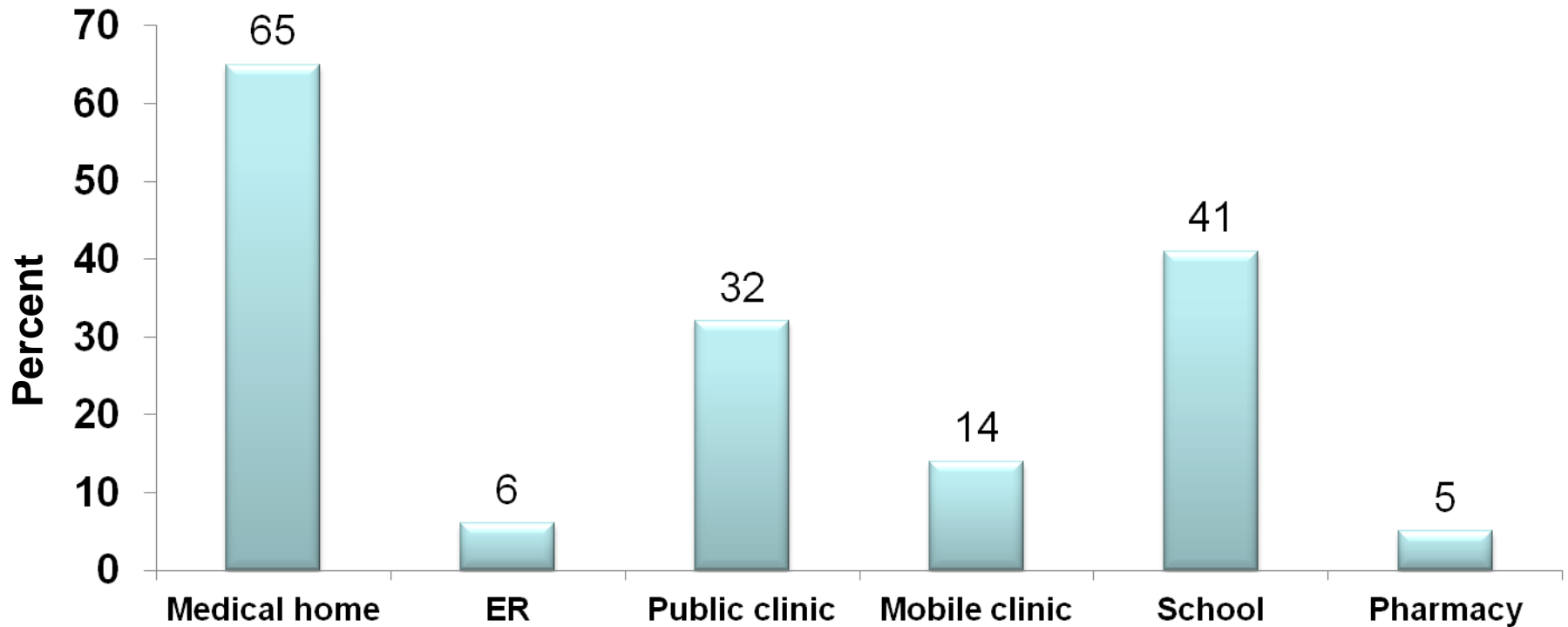
## □ Sites

- Pharmacies, school-located clinics, city/county clinics, family planning clinics, Ob/Gyn offices and clinics, emergency departments

## □ Potential Benefits

- Immunize adolescents who lack a medical home AND provide a list of nearby adolescent medical homes
- Complete multiple-dose regimens
- Provide access (e.g., expanded hours and closer to home)
- Safety of vaccination at alternate sites documented
- Share information with patient's medical home using IIS

# Middle School Parents' Willingness to Use Alternative Sites



Houston, Texas; 1838 respondents  
Middleman AB et al. Vaccine 2010; 28:2674-78

# School-Located Vaccination

## □ Benefits

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

## □ Challenges

- Adolescent participation may be limited to specific sub-groups
- Cost to provide vaccination in schools can be quite high
- Billing different health plans for immunization services
- Obtaining parental consent

# Preliminary Data From A School-located Immunization Program Targeting VFC-eligible Students in Houston, Fall, 2012

- ❑ **Approximately 6% of all students returned consent forms**
- ❑ **Among 8 middle schools, 522 eligible students were immunized:**

Vaccine	Number Administered
Flu (inactivated and LAIV)	475
Tdap	328
MCV4	327
HPV	410
Other (HepB, varicella, etc.)	82

# Insurance Reforms that Might Impact Vaccine Uptake (Affordable Care Act)

## ❑ **First dollar coverage under private insurance**

- No out of pocket costs for all ACIP routinely recommended vaccines when given by in-network provider
- In effect September 2010
- Plans have one year following CDC adoption of new ACIP recommendations to implement

## ❑ **Increase in Medicaid reimbursement for vaccine administration fee - time limited**

- Time period: 2013-2014
- Before 2013 range: \$2.00 - \$17.85
- Proposed fees range: \$19.54 - \$27.44

# Increasing HPV Vaccine Coverage

- ❑ **Adolescent platform**
- ❑ **Public policy strategies**
- ❑ **Provider strategies**
  - Practice strategies
  - Provider communication

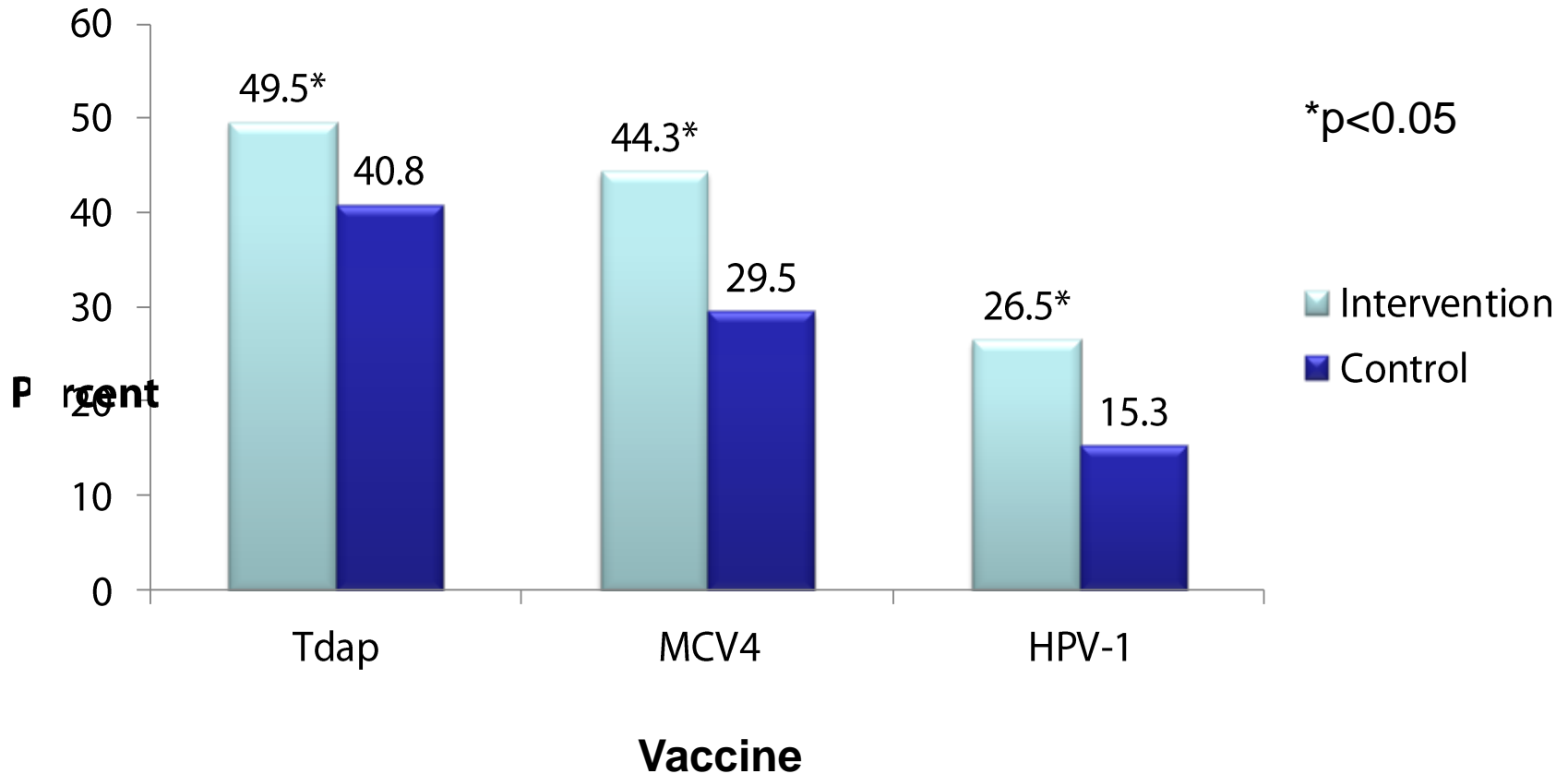


# Strengthening Immunization in the Medical Home: What Can Providers Do?

- ❑ **Increase their own knowledge regarding vaccine recommendations and safety of recommended vaccines**
- ❑ **Improve communication with parents**
  - Importance of provider recommendation
  - Overall messages
  - Responses to specific concerns
- ❑ **Initiate practice changes to increase immunization**
  - Recall systems
  - Screening tools and standing orders
  - Use of Immunization Information Systems (IIS)
  - Vaccination “quick visits”



# Impact of Reminder and Recall on Vaccination Rates among Adolescents



# Key Messages for Parents

- ❑ **This is a vaccine to prevent CANCER**
- ❑ **The vaccine is SAFE and EFFECTIVE**
- ❑ **The time to give the vaccine is before exposure**
- ❑ **Vaccine is recommended for boys and girls**

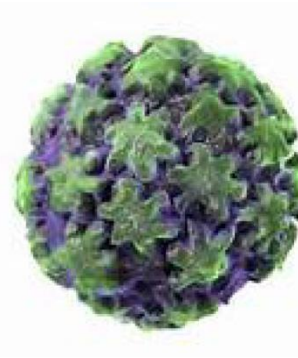
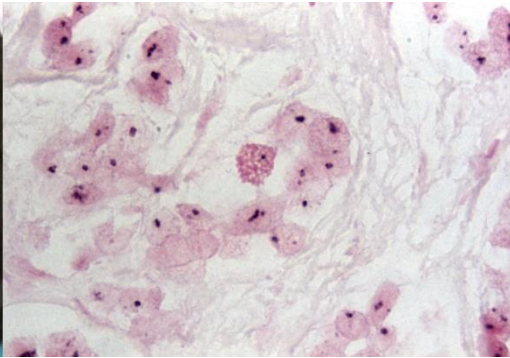
# Guidance for Providers: Improving the “Discussion”

- ❑ **The discussion regarding mode of HPV transmission should be age appropriate**
- ❑ **Discussion of HPV vaccine might provide an opportunity to discuss sexual health issues, if appropriate**
- ❑ **Vaccination not found to result in increase sexual risk behavior**

# Take Home Points

- ❑ New immunization recommendations provide enhanced primary prevention opportunities for adolescents**
- ❑ Public health policies at state and federal levels can be implemented to support adolescent immunization**
- ❑ Providers can implement communication and quality improvement strategies in the office to improve adolescent immunization rates**

# Prevention of HPV-associated Disease Global and Domestic Overview



**Lauri Markowitz, MD**

*Team Lead*

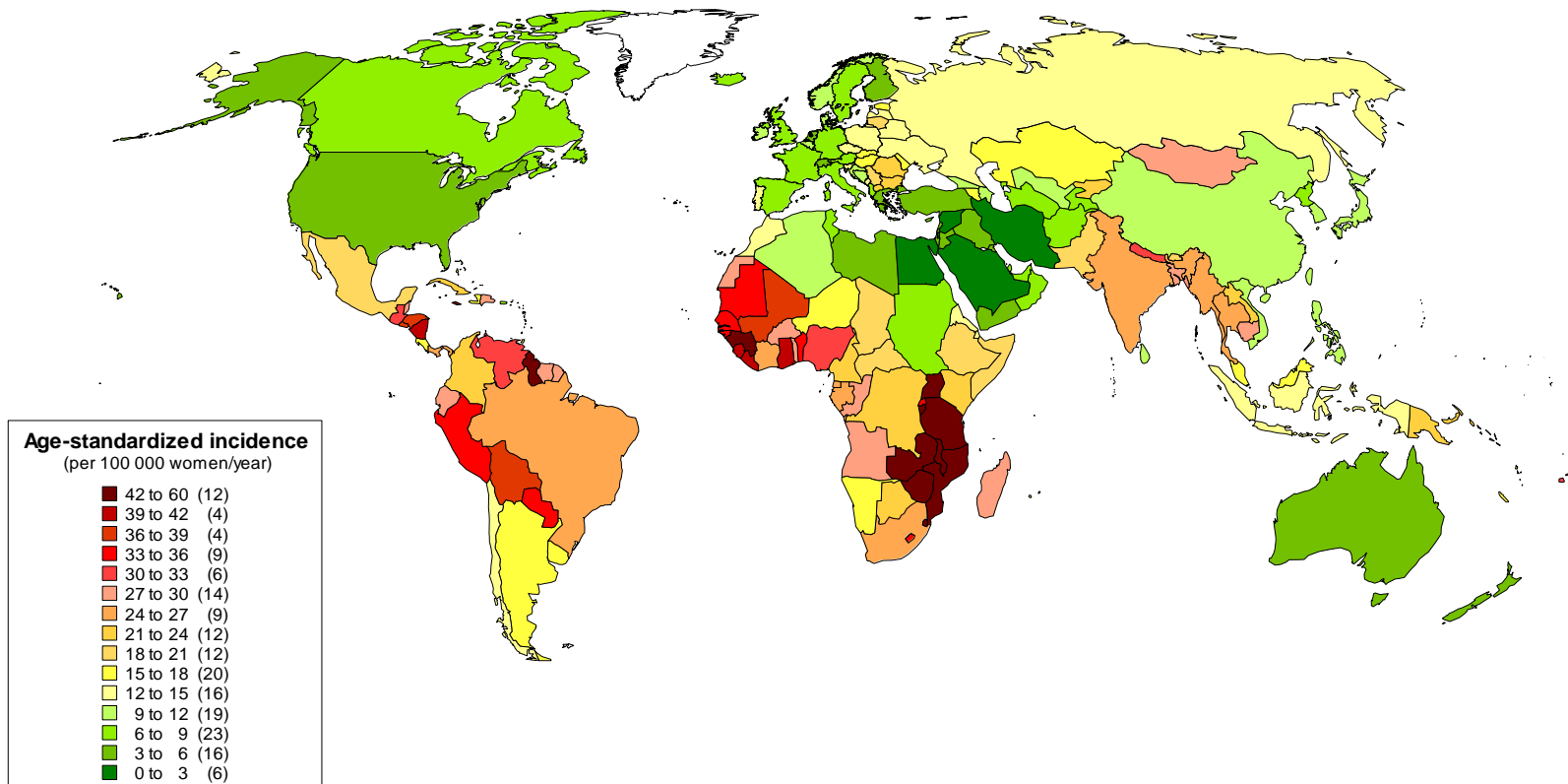
Division of STD Prevention

National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention

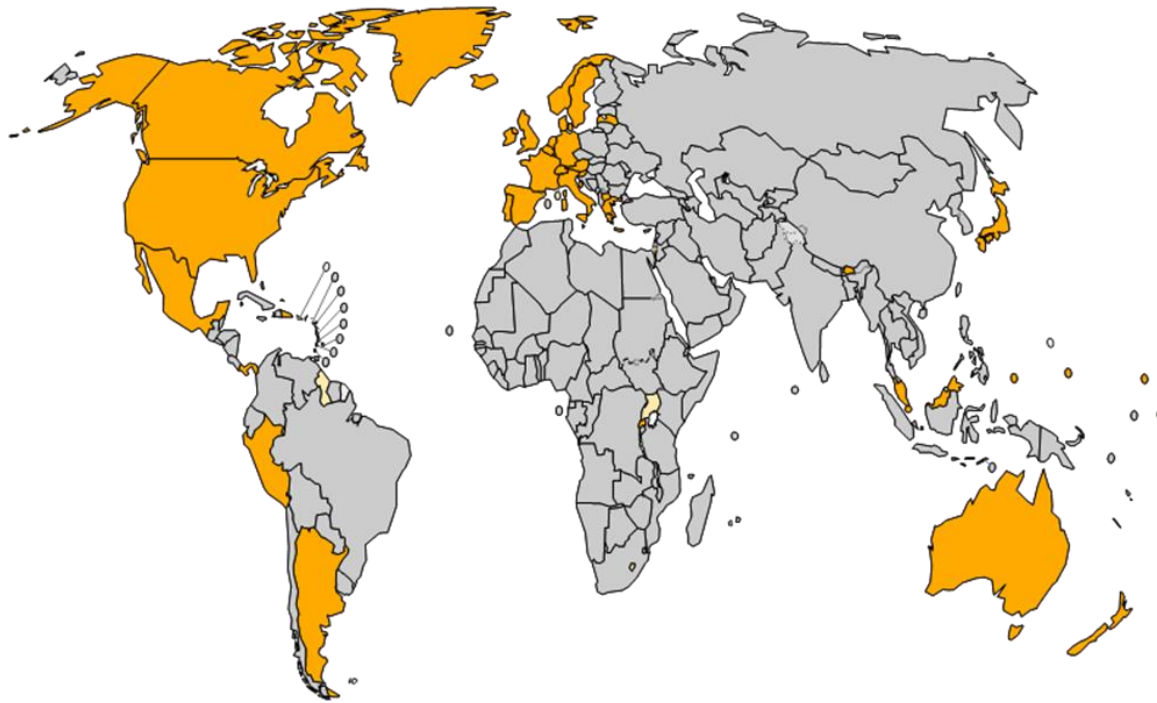
# Global Burden of Cervical Cancer

Incidence of cervical cancer per 100,000 females (all ages), age-standardized 2008

80% of cervical cancer deaths occur in developing countries



# Countries with HPV Vaccine in their National Immunization Schedules, 2011



- ❑ HPV vaccination programs have been introduced into more than 40 countries
- ❑ Most are developed countries
- ❑ Challenges:
  - Expense of vaccine
  - Competing priorities with other new vaccine introduction
  - Adolescent target age group

WHO/IVB database, 194 WHO Member States. Data as of October 2012



# International Cervical Cancer Prevention Efforts

- ❑ **WHO recommends introduction of HPV vaccination**
  - Part of a comprehensive strategy for cervical cancer prevention
- ❑ **Vaccine financing will allow increased HPV vaccine introductions in low resource countries**
  - The Global Alliance on Vaccines and Immunizations (GAVI) will fund HPV vaccine for eligible countries starting in 2013
- ❑ **Cervical cancer prevention through other public-private partnerships focusing on cervical cancer screening**
  - Pink Ribbon Red Ribbon®  
(Partners include Susan G. Komen for the Cure, PEPFAR, George W. Bush Foundation, UNAIDS)

# Summary

- ❑ **The substantial burden of HPV-associated disease can be decreased by use of two available safe and effective prophylactic HPV vaccines**
- ❑ **In the United States, vaccine coverage is below target goals**
  - Programs are in place to monitor coverage, safety and impact of vaccination
  - Measures can be implemented to improve vaccine uptake
- ❑ **Progress being made to introduce vaccine in low income countries where most cervical cancer cases and deaths occur**