

# Factors associated with immunization provider reporting to IIS, 2006-2010

## Results from the National Immunization Survey

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# Outline

- Background
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# What is the National Immunization Survey (NIS)?

- NIS is a random-digit dial survey of parents that collects vaccination coverage information on children aged 19-35 months and adolescents aged 13-17 years
- A mailed survey to immunization providers identified during the telephone interview is used to collect provider-reported vaccination histories
- Conducted annually since 1994 to monitor childhood vaccination coverage at national, state and selected local areas
- In 2006, a national sample of adolescents aged 13-17 years was added (NIS-Teen)

# Why examine provider reporting to IIS?

- ❑ IIS rely on immunization providers to report client vaccination information to IIS
  - Not all providers report to IIS; in 2012, 86% of children aged <6yo, 54% of adolescents aged 11-17 years and 25% of adults  $\geq 19$  years participated in an IIS<sup>1</sup>
  - Provider participation rates are difficult to determine, and wide variation in rates in the U.S. have been documented<sup>2</sup>
- ❑ Few studies have examined reasons for provider participation<sup>3</sup>
  - Barriers to participation include high cost, too much staff time, and that the practice has its own system for recording and monitoring immunizations

# Why examine provider reporting to IIS?

- ❑ Identification of factors that affect provider use of IIS is a research priority to increase provider participation<sup>1</sup>
- ❑ Longitudinal data from NIS provides an opportunity to examine factors that are associated with provider reporting to IIS in a nationally representative sample of children and adolescents in the U.S., and how these factors may have changed over time
- ❑ This study will assist in determining strategies for increasing provider participation in IIS

## Objectives

- ❑ To determine the frequency in which vaccination providers who care for children aged 19-35 months report use\* of IIS
- ❑ To determine the frequency in which vaccination providers who care for adolescents aged 13-17 years report use of IIS
- ❑ To examine trends in provider use of the IIS from 2006-2010
- ❑ To identify factors associated with provider use of IIS

\* Provider “use” of IIS includes immunization reporting to, and or obtaining information from, IIS

## Methods

- ❑ Data from children 19 to 35 months of age and adolescents aged 13 through 17 years sampled by the 2006-2010 National Immunization Survey (NIS) were available for analysis
- ❑ State of child's/adolescent's residence was used as a proxy for state of provider's practice
- ❑ Only children and adolescents with provider-verified data were included in the analysis
  - Each child/adolescent had at least one and up to 5 providers surveyed
- ❑ Children and adolescents who moved to another state since birth were excluded from the analysis (children n=7,240; adolescents n=13,671)
- ❑ Resulted in a sample size of 83,798 children and 50,768 adolescents for analysis

# Methods

## Immunization History Questionnaire: IIS questions

1. Was any of the immunization information for this child/adolescent obtained from your community or state registry?
2. Did you or your facility report any of this child's/adolescent's immunizations to your community or state registry?



## Methods

- Percentages of children and adolescents with ≥1 provider reporting to or obtaining data from IIS were determined
  - Significance of trend from 2006-2010 evaluated by chi-square and trend test
  - State estimates calculated based on child's/adolescent's residence
  - Children and adolescents with missing/unknown data for IIS-specific questions were excluded from analyses (23%-38%)

# Methods

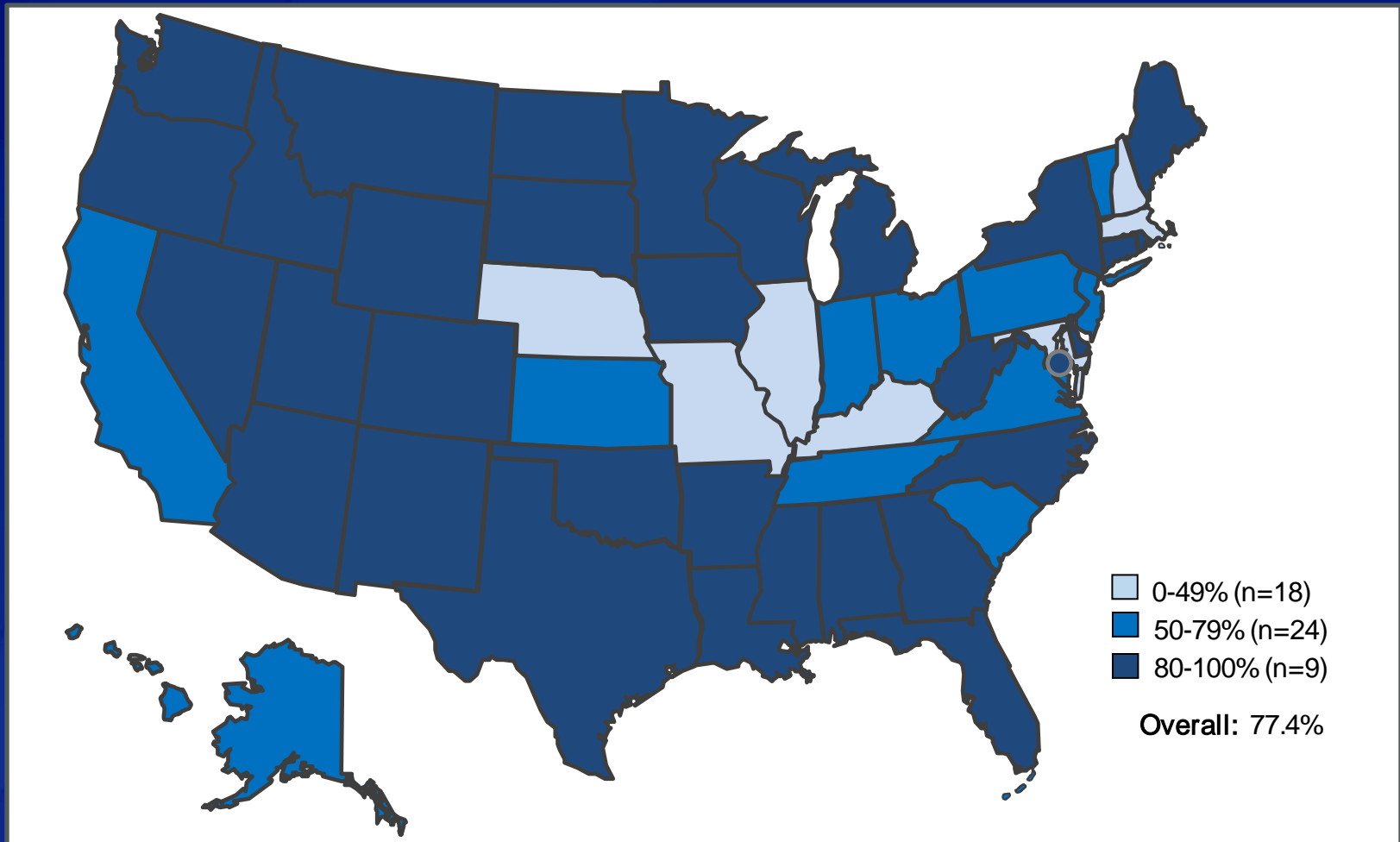
- ❑ Multivariable logistic regression was used to assess what factors were associated with having vaccination data reported to the IIS
  - Variables included
    - Provider factors such as:
      - obtained data from the IIS
      - ordered vaccine from a health department
      - facility type (private, public, etc)
    - Child/adolescent factors such as:
      - receipt of WIC benefits
      - race/ethnicity
      - urban/rural status
      - number of providers per child/adolescent
      - state of the child's/adolescent's residence
  - Variables were assessed for correlation

## Methods

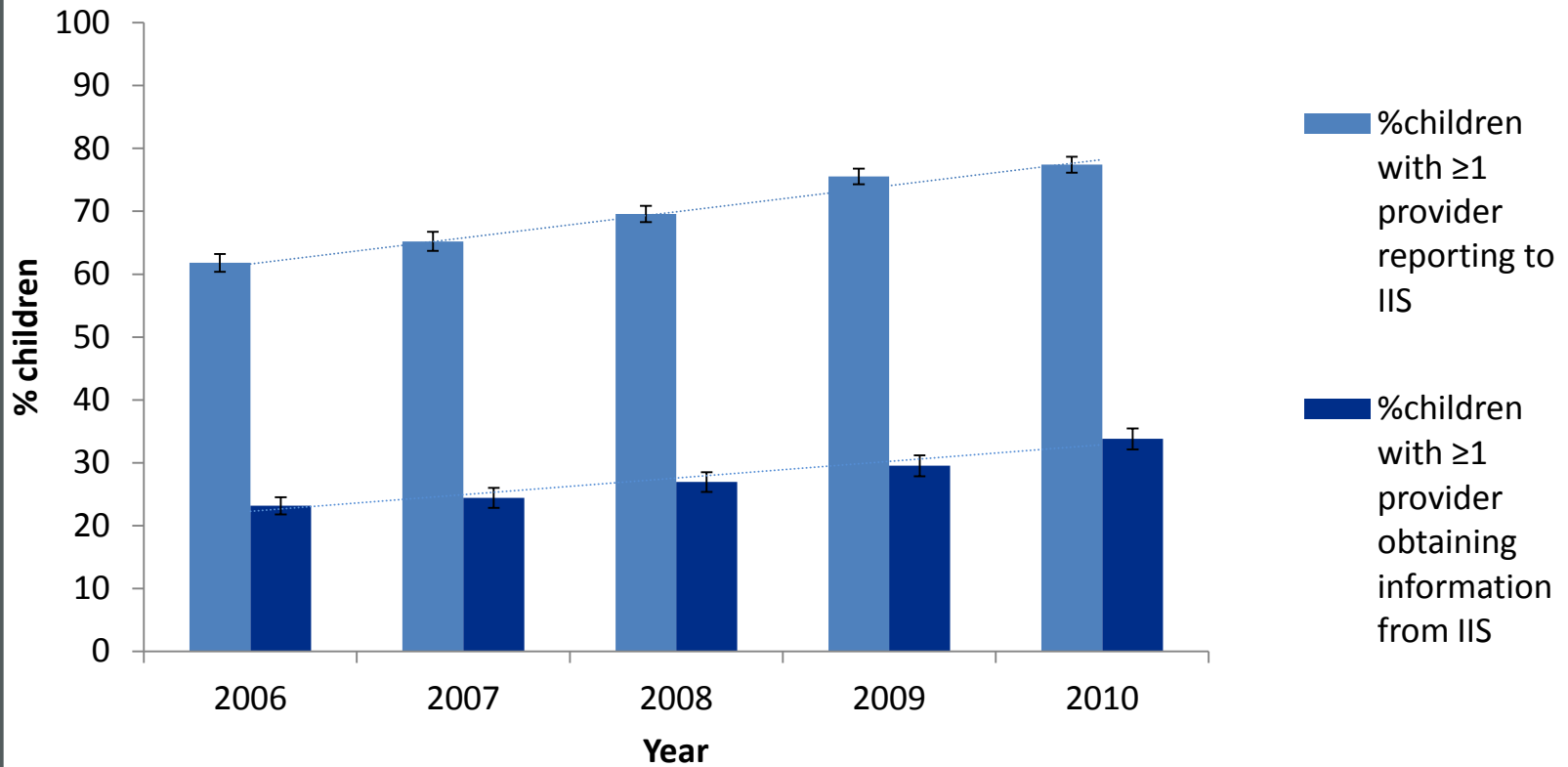
- ❑ Analyses were performed using SAS/SUDAAN to account for the complex survey sample design in calculating standard errors
- ❑ Predictive margins were used to calculate adjusted percentages of children with  $\geq 1$  provider reporting to the IIS
  - Type of direct standardization
  - Allows for comparison of group outcomes while controlling for the covariate distribution in the population
  - Best used when the outcome is not rare (i.e. > 10%)
  - Allow for easier comparisons since there is no referent group

# Preliminary results: child analysis

# Percentage of children with $\geq 1$ provider reporting vaccination records to an IIS, 2010



# Trends in IIS use: Percentage of children with $\geq 1$ provider reporting to or obtaining data from IIS



# Factors associated with reporting a child's vaccination records to an IIS: Results from multivariable analysis (1)

Variable	Predictive margins adjusted estimate (95% CI)	p-value
<b>Provider obtained vaccination information from IIS</b>		<b>&lt;0.0001</b>
≥1 Providers	85.9 (84.2, 87.6)	
No Providers	69.6 (68.5, 70.6)	
<b>Provider ordered vaccine from state/local health department</b>		<b>&lt;0.0001</b>
≥1 Providers	75.2 (74.2, 76.1)	
No Providers	58.2 (55.9, 60.5)	
<b>Type of Provider Facility</b>		<b>&lt;0.0001</b>
Mixed	92.2 (90.1, 94.2)	
All public facilities	82.7 (80.6, 84.7)	
All hospital facilities	78.2 (75.6, 80.8)	
All private facilities	68.1 (67.0, 69.3)	
All military/other facilities	60.7 (65.7, 75.1)	

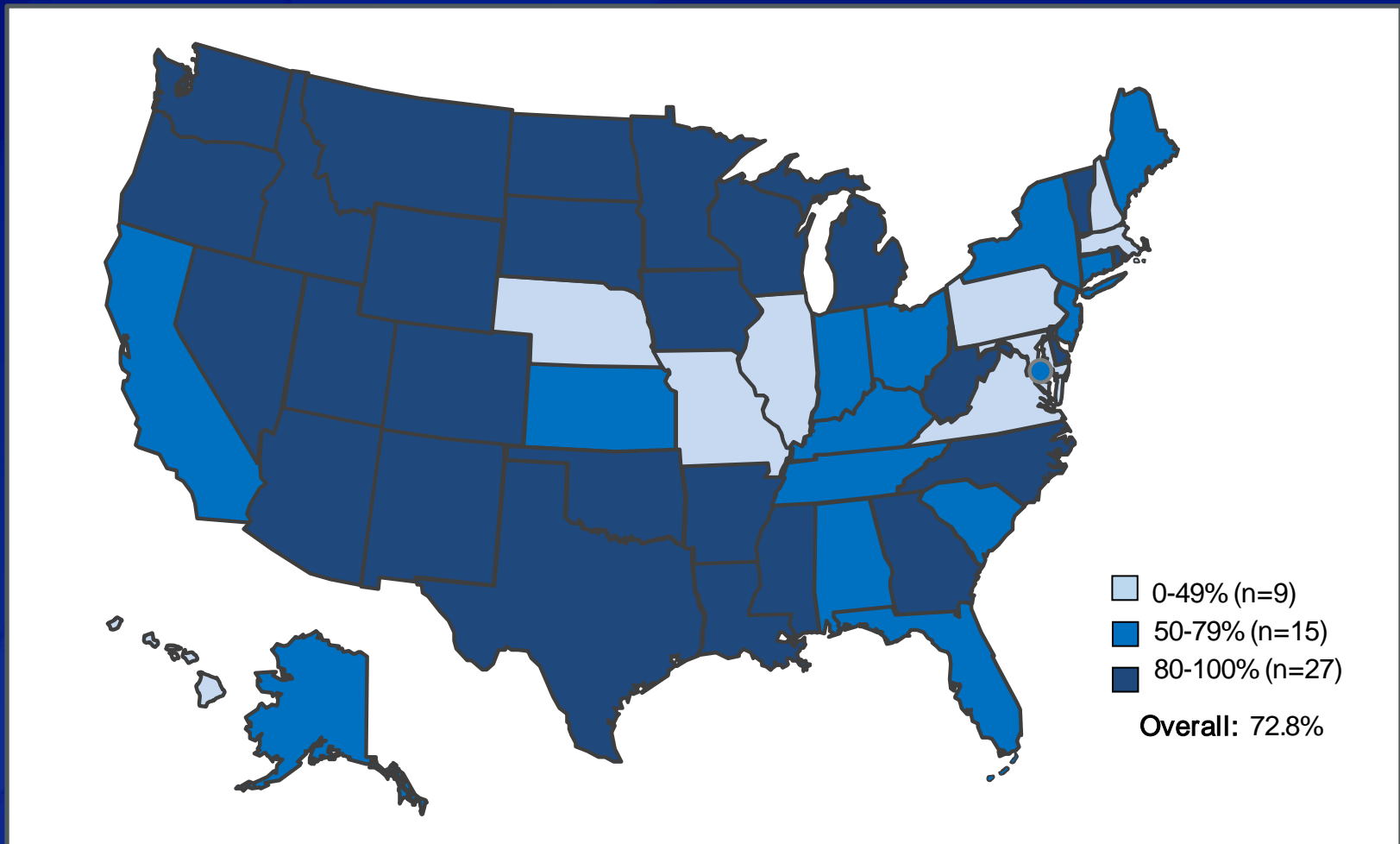
## Factors associated with reporting a child's vaccination records to an IIS: Results from multivariable analysis (2)

Variable	Predictive margins adjusted estimate (95% CI)	p-value
<b>Child received WIC benefits</b>		<b>&lt;0.0001</b>
Yes, currently	76.2 (74.7, 77.7)	
No	69.6 (68.4, 70.8)	
<b>Child's residence</b>		<b>&lt;0.01</b>
Rural	74.9 (73.0, 76.8)	
Urban	73.2 (71.9, 74.5)	
Suburban	71.7 (70.4, 72.9)	
<b>Number of providers per child</b>		<b>&lt;0.01</b>
2 or more Providers	74.7 (73.1, 76.3)	
1 Provider	72.0 (71.0, 73.1)	

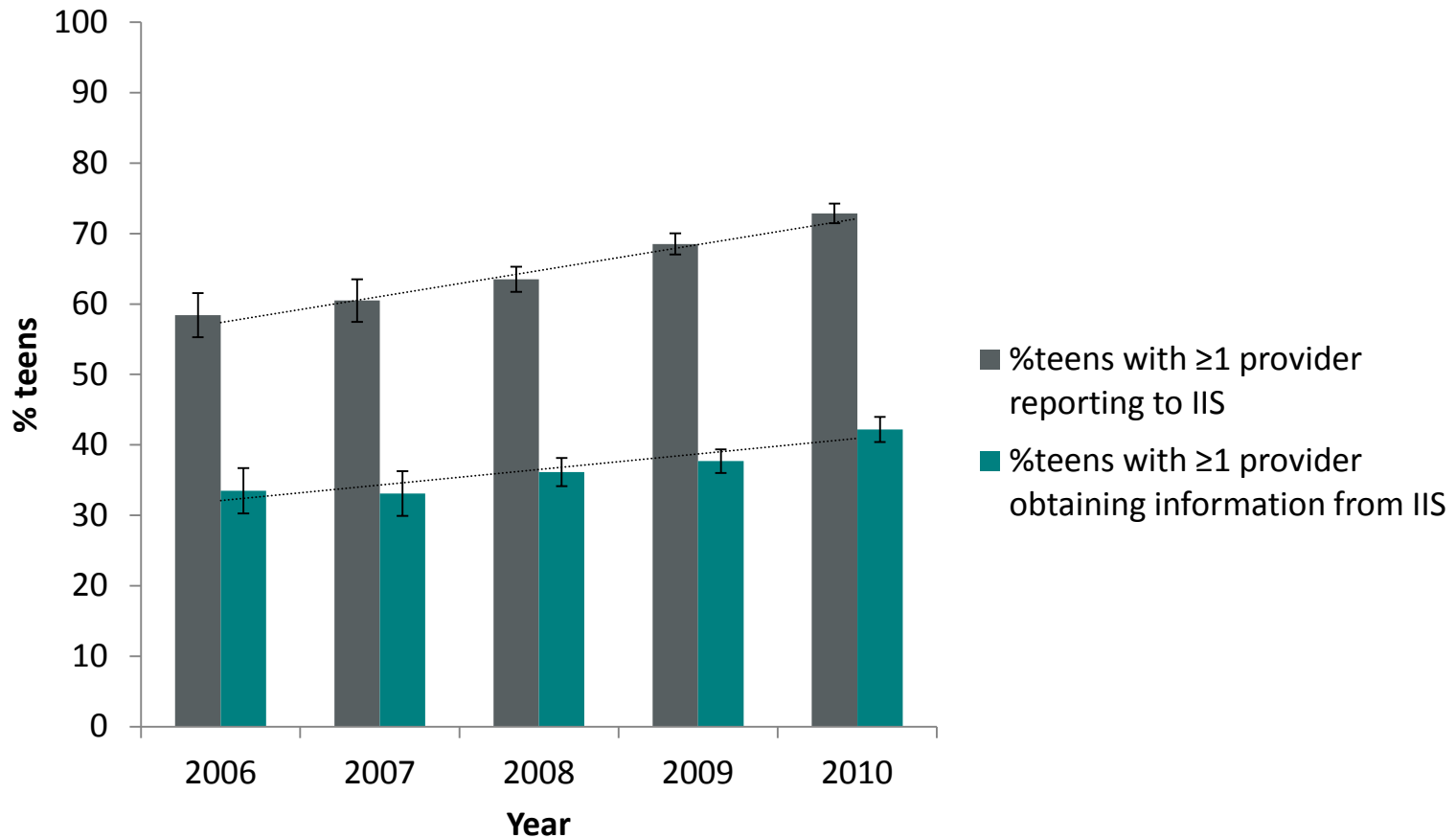


# Preliminary results: adolescent analysis

# Percentage of teens with $\geq 1$ provider reporting vaccination records to an IIS, 2010



# Trends in IIS use: Percentage of teens with $\geq 1$ provider reporting to or obtaining data from IIS



## Factors associated with reporting a teen's vaccination records to an IIS: multivariable analysis

Variable	Predictive margins adjusted estimate (95% CI)	p-value
<b>Provider obtained vaccine information from IIS</b>		<0.0001
≥1 Providers	84.8 (83.1, 86.3)	
No Providers	58.8 (57.3, 60.2)	
<b>Provider ordered vaccine from state/local health department</b>		<0.0001
≥1 Providers	71.7 (70.5, 72.8)	
No Providers	45.4 (42.6, 48.2)	
<b>Type of Provider Facility</b>		<0.0001
Mixed	88.2 (86.1, 89.9)	
All public facilities	78.9 (76.2, 81.4)	
All hospital facilities	71.5 (67.3, 75.3)	
All STD/School/Teen clinic/other	61.6 (54.8, 68.0)	
All private facilities	59.9 (58.4, 61.3)	
<b>Teen's residence</b>		<0.0001
Urban	72.1 (70.4, 73.7)	
Rural	67.9 (65.7, 70.1)	
Suburban	63.3 (61.8, 64.9)	

## Limitations

- ❑ Data from the NIS provider questionnaire are self-reported, and the respondent is unknown
- ❑ Prior to 2011, NIS excluded children and adolescents from wireless phone only households
  - However, the data are weighted for nonresponse bias, telephone coverage, and birth/immigration patterns
- ❑ All data are analyzed at child- and teen-levels, not provider-level
- ❑ The state where a child or adolescent resides was used as a proxy measure for the provider and IIS location

## Conclusions (1)

- ❑ Rates of IIS participation by provider sites increased during 2006-2010 for both children and adolescents, but still remains suboptimal
  - In 2010, 77% of children and 73% of teens had  $\geq 1$  providers report their vaccination data to an IIS
  - In 2010, 34% of children and 42% of teens had  $\geq 1$  providers obtain vaccination data from an IIS
  - Estimates varied substantially by state

## Conclusions (2)

- ❑ Children and adolescents were less likely to have their vaccination records reported to an IIS if they:
  - Did not have their vaccination history obtained from an IIS by any providers
  - Had no providers who ordered vaccine from a state/local health department
  - Received their care from private providers
  - Lived in a suburban area
  - Additionally, children were less likely to have their records reported if they had only 1 provider and they never received WIC benefits

# Recommendations

- ❑ To increase IIS use by providers, State health departments should:
  - Target providers who are less likely to report to IIS
    - private providers
    - providers who do not order vaccine from the local/state health department
  - Target providers of children and teens who are less likely to have their vaccination data reported to IIS
    - Children and teens who live in suburban areas
    - Children who have never received WIC benefits
    - Children who only have 1 provider



# Thank you

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