

Limitations and Utility of Exemption Data

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Limitations I

- Imperfect association between attitudes and actions
- Out-migration
 - Children migrating into new areas captured
- Homeschooled children
- Assessments based on surveys or voluntary response (e.g., an incomplete census)
 - can miss schools with higher or lower vaccination coverage and thereby bias results

Limitations II

- Exemption status may not reflect vaccination status.
- Vaccination coverage and exemptions among non - respondents and respondents within the same school type

Potential Limitations

Imperfect association between
attitudes and actions

Attitude vs. Actions

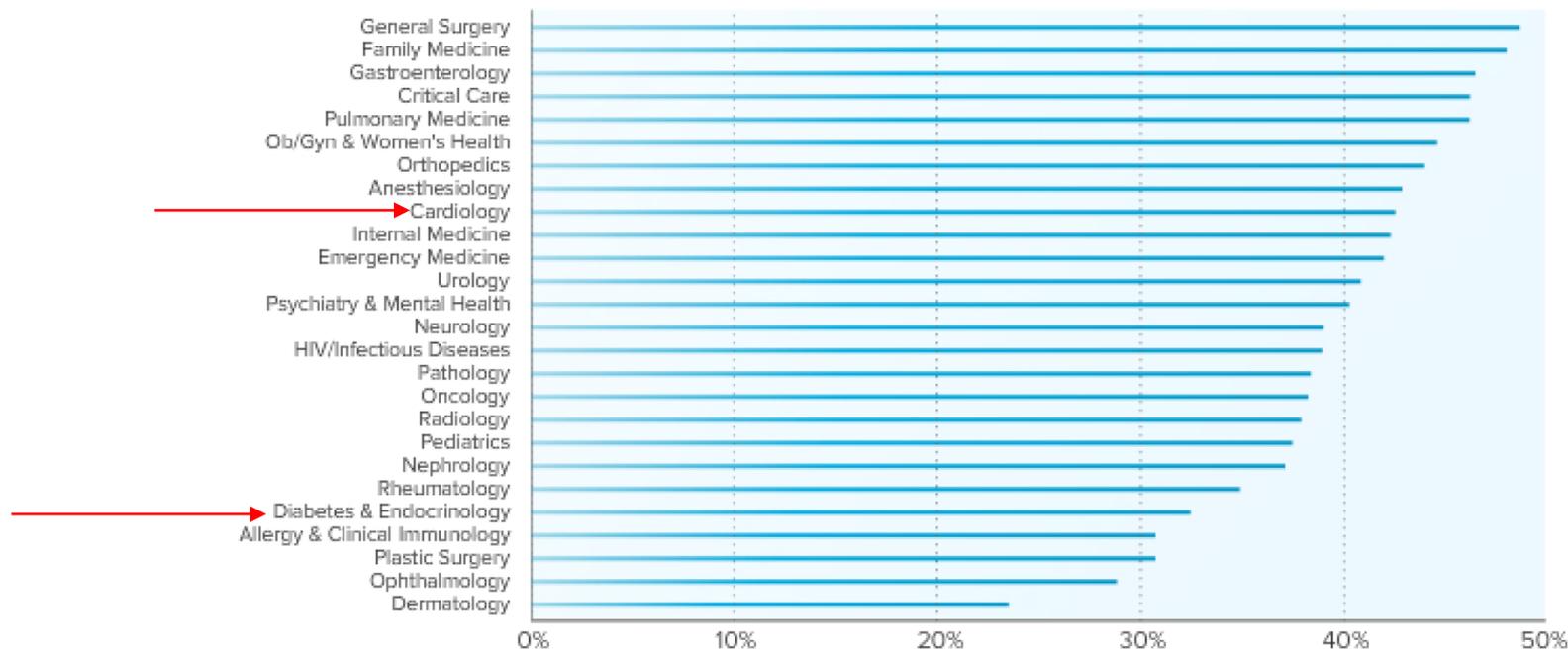
Table 3.1

ATTITUDE MEASURE	CORRELATION WITH BEHAVIOR (USING BIRTH CONTROL PILLS DURING A 2-YEAR PERIOD)
1. Attitude toward birth control	.083
2. Attitude toward birth control pills	.323
3. Attitude toward using birth control pills	.525
4. Attitude toward using birth control pills during the next 2 years	.572

Note: Data from Davidson and Jaccard (1979).

Attitude vs. Actions

Which Physicians Are the Most Overweight?



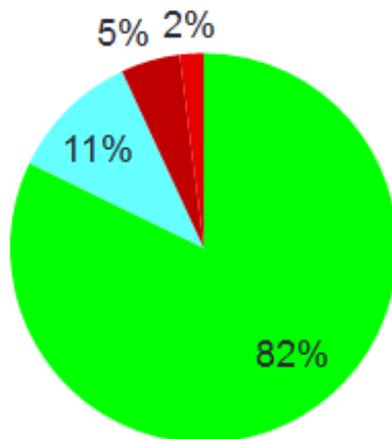
Attitude vs. Actions

- When and under what circumstances attitudes are related to behavior
 - Measurement issues
 - Perceived behavioral control
 - Attitude formation
 - Cognitive processing
 - Situational factors

2010 HealthStyles Survey

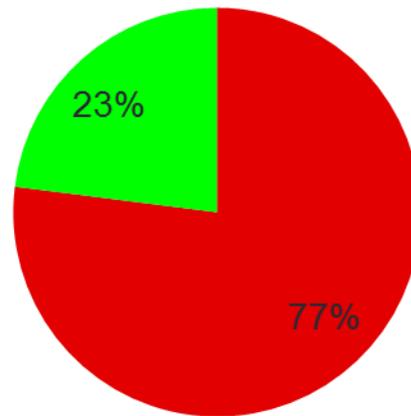
Intentions to Vaccinate

- Already vaccinated
- Planned to vaccinate
- Intend to partially vaccinate
- Would not give any vaccine

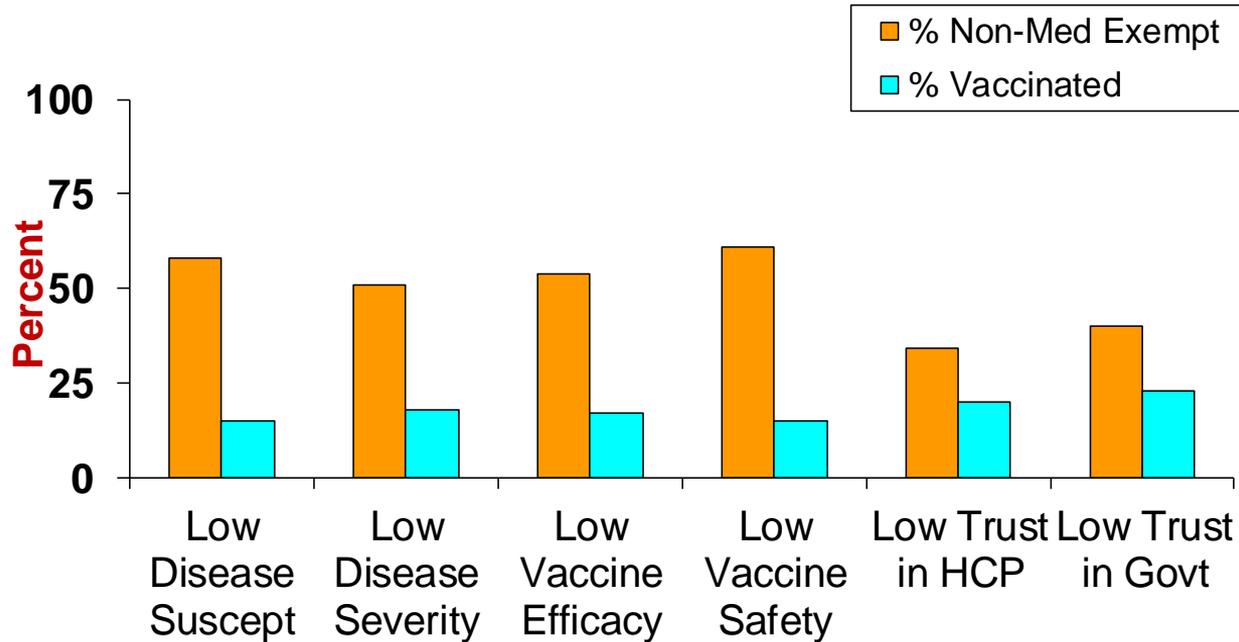


Specific Vaccine Concerns

- Yes
- No



Parents' Perceptions by Child's Vaccination Status



Potential Limitations

Incomplete Data on Homeschooled Children

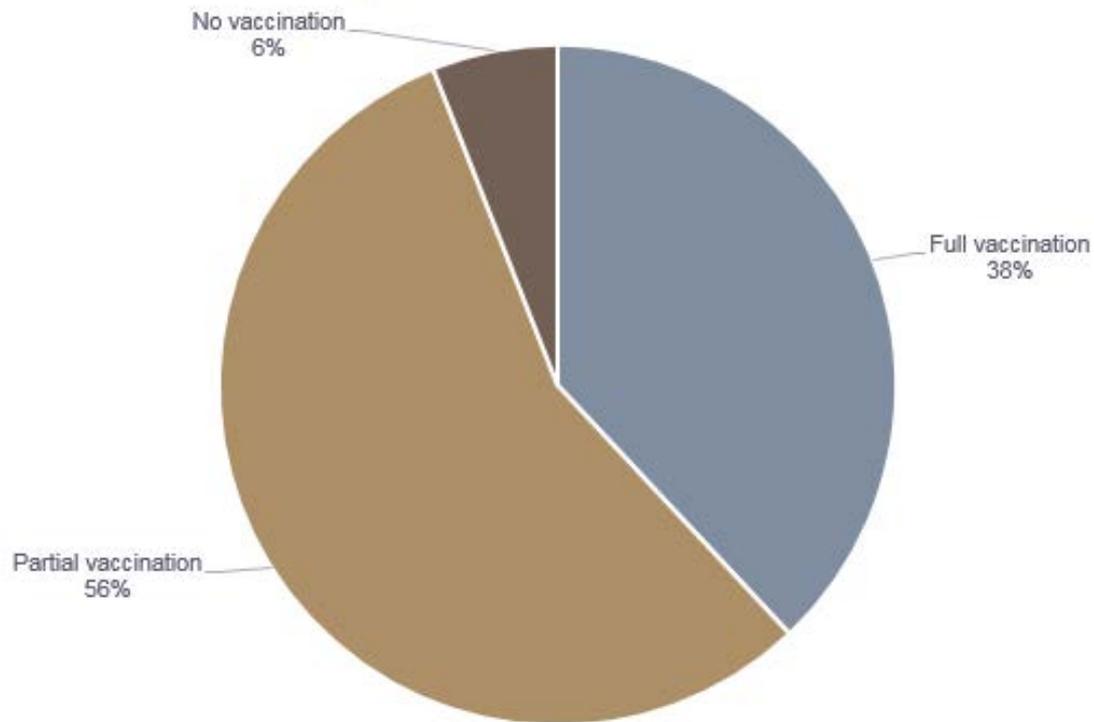
Homeschooled Children

- 3 percent of U.S. population*
- Many covered by school requirements (e.g. use of school gyms and labs)

Table 2. Adjusted Odds Ratios for health care access and utilization
(reference group is public school children).

	Homeschooled - Adjusted OR (C.I.)
<i>Health care access</i>	
Insurance	0.81 (0.55-1.18)
Medical home	0.59 (0.46-0.76)
<i>Health care utilization</i>	
Medical visit in last year	0.55 (0.42-0.72)
Dental visit in last year	1.03 (0.75-1.41)
HPV vaccine (girls ages 12-17)	0.29 (0.10-0.89)
Meningitis vaccine (ages 12-17)	0.94 (0.52-1.70)
Tetanus vaccine (ages 12-17)	0.71 (0.46-1.11)

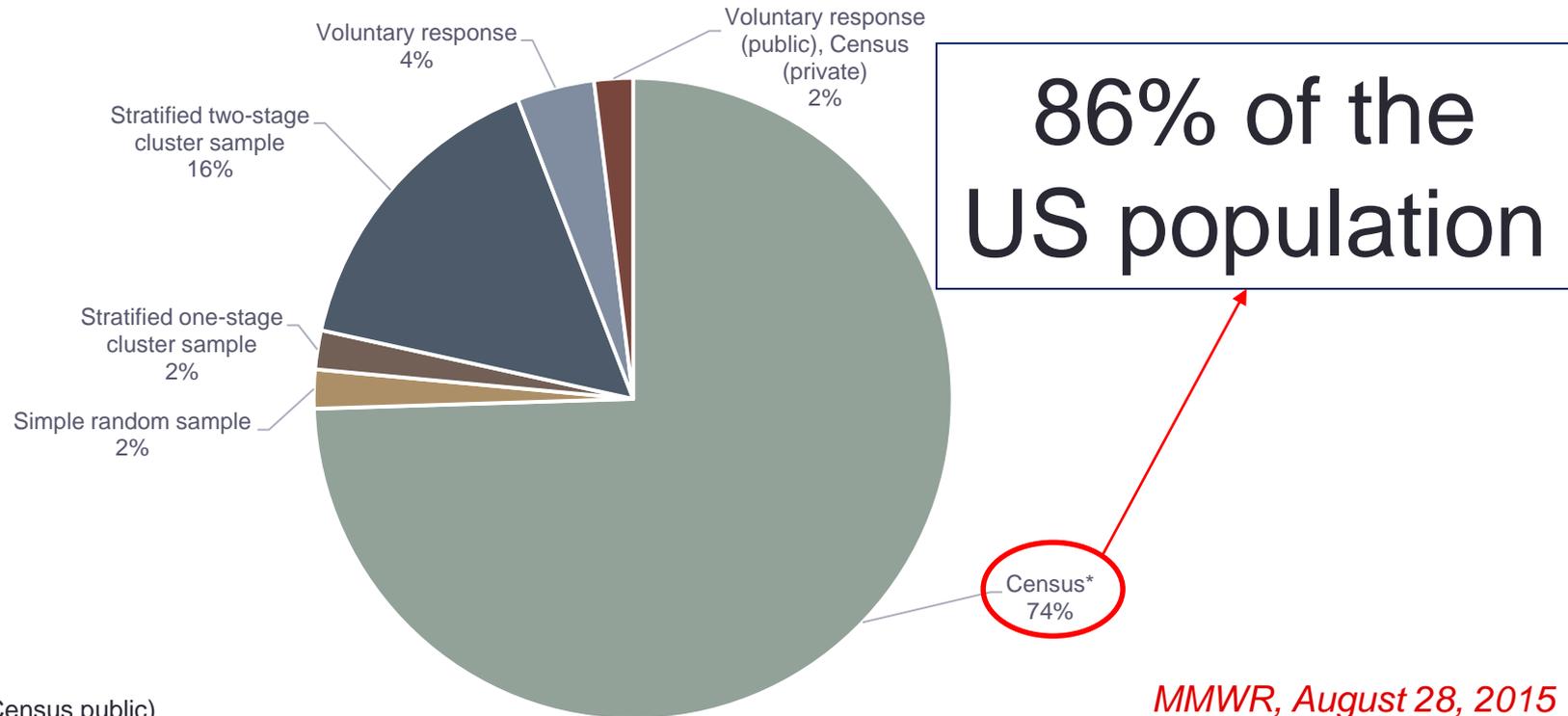
Online Survey of Homeschoolers



Potential Limitation

Assessments based on surveys
or voluntary response (e.g., an
incomplete census)

Estimated vaccination coverage by survey methodology

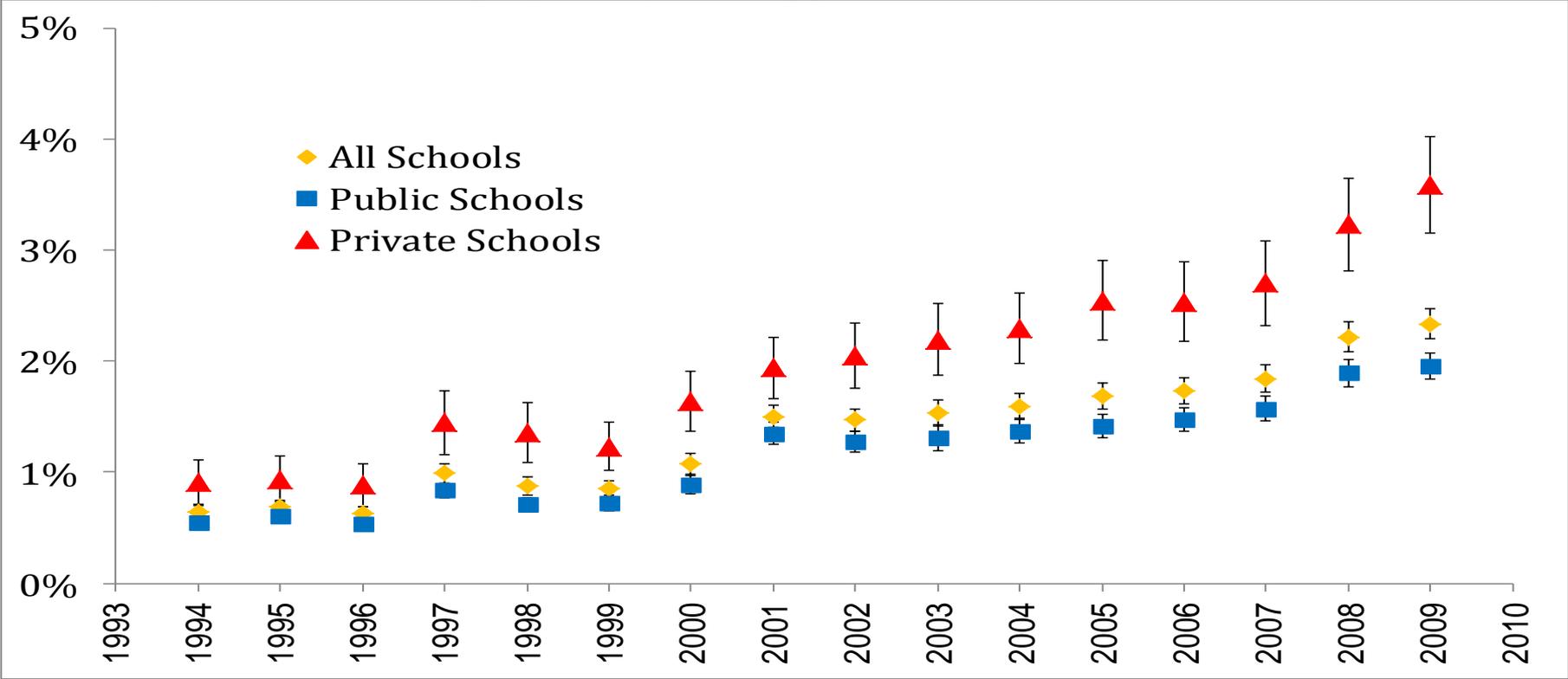


86% of the
US population

Census*
74%

* Voluntary private (Census public)
school response for 9 states

School-level Personal Belief Exemption Rates Overall & by School Type



Vaccination Coverage Among Children in Kindergarten — United States, 2009–10 School Year

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Weekly / Vol. 63 / No. 41

October 17, 2014

Vaccination Coverage Among Children in Kindergarten — United States, 2013–14 School Year

Ranee Seither, MPH¹, Svetlana Masalovich, MS², Cynthia L Knighton¹, Jenelle Mellerson, MPH², James A. Singleton, PhD¹,
Stacie M. Greby, DVM¹ (Author affiliations at end of text)

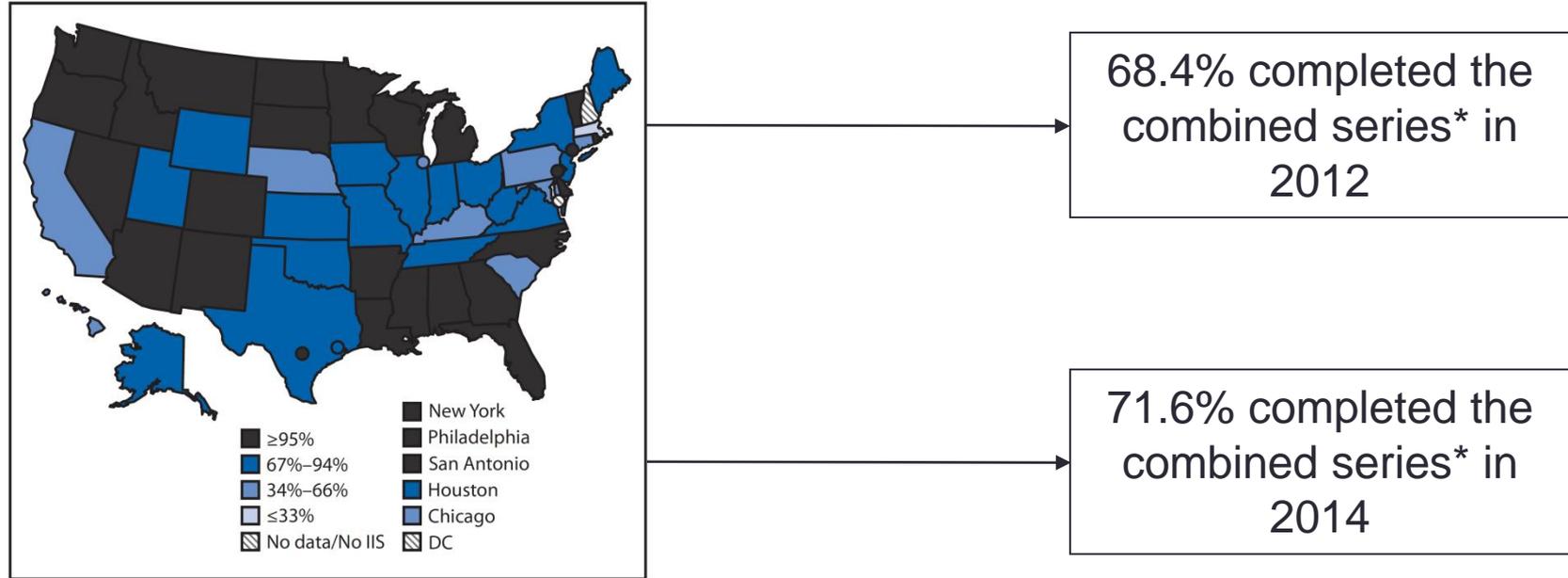
Vaccination Coverage Among Children in Kindergarten — United States, 2012–13 School Year

Potential Limitation

Exemption status may not
reflect vaccination status

Completeness of Immunization Registries

FIGURE 1. Percentage of children aged <6 years participating in an immunization information system (IIS)* — United States, five cities,† and the District of Columbia (DC), 2012



* Child participation is defined as having two or more vaccinations for children aged <6 years documented in the IIS. National child participation = 86%.

† Chicago, Illinois; New York, New York; Philadelphia, Pennsylvania; Houston, Texas; and San Antonio, Texas.

The combined (4:3:1:3:3:1:4) vaccine series includes ≥4 doses of DTaP, ≥3 doses of poliovirus vaccine, ≥1 dose of measles-containing vaccine, full series of Hib vaccine (≥3 or ≥4 doses, depending on product type), ≥3 doses of HepB, ≥1 dose of varicella vaccine, and ≥4 doses of PCV.

MMWR, December 13, 2013

MMWR, August 28, 2015

Council of American Survey Research Organization (CASRO) Methodology for Response Rate (NIS)

- Household response rate = resolution rate x screening completion rate x interview completion rate

CASRO response rates for NIS

Childhood NIS

100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%

LL	LL	LL	LL	CP	LL	CP	LL	CP	LL	CP
2008	2009	2010	2011		2012		2013		2014	

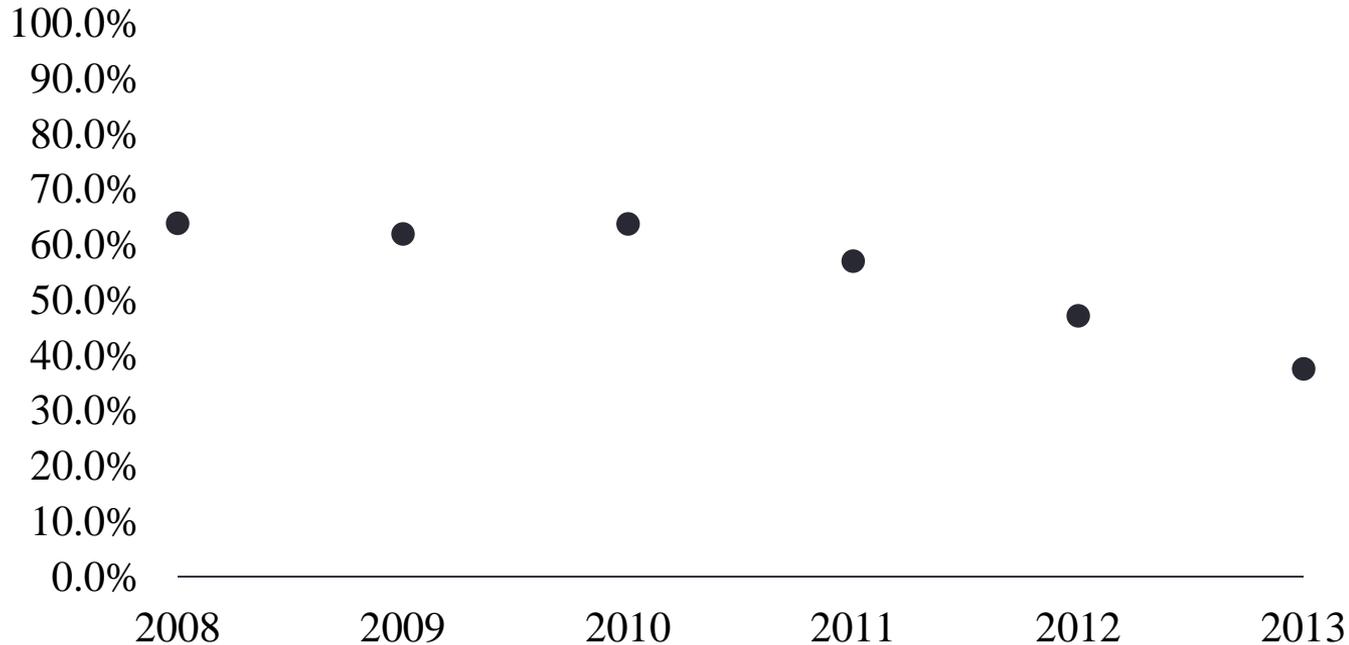
■ CASRO Response Rate — Cellphone only households

2014 Response Rates

- 62.6% landline
- 33.5% cell phone

CASRO response rates for NIS

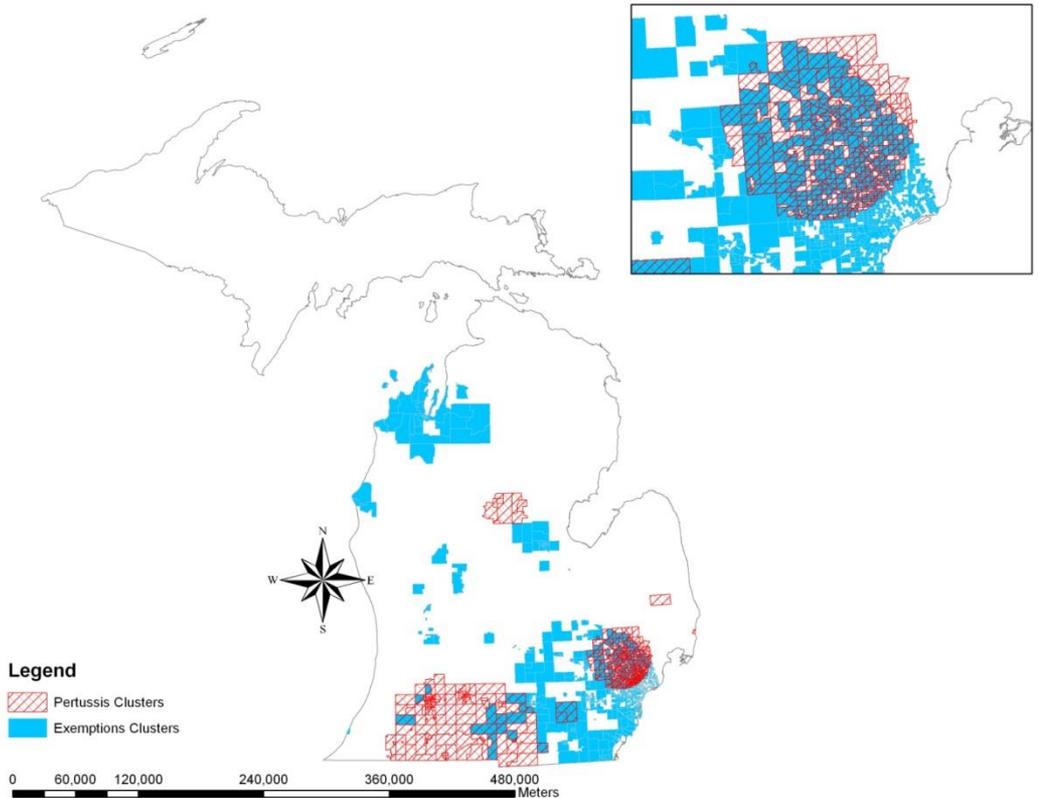
Childhood NIS Response Rate (Weighted by Sample Frame Response)



Utility of Exemption Data

- Active decision on vaccinating or filing for exemption
- Capitalize on existing infrastructure
 - Already collecting the data, why not (judiciously) use it?
- Overall high completion rates
- Local precision
- Can identify clusters

Relative Locations of Pertussis Space-time Clusters & Exemptions Spatial Clusters



Overlap of Exemptions Clusters with Pertussis Clusters

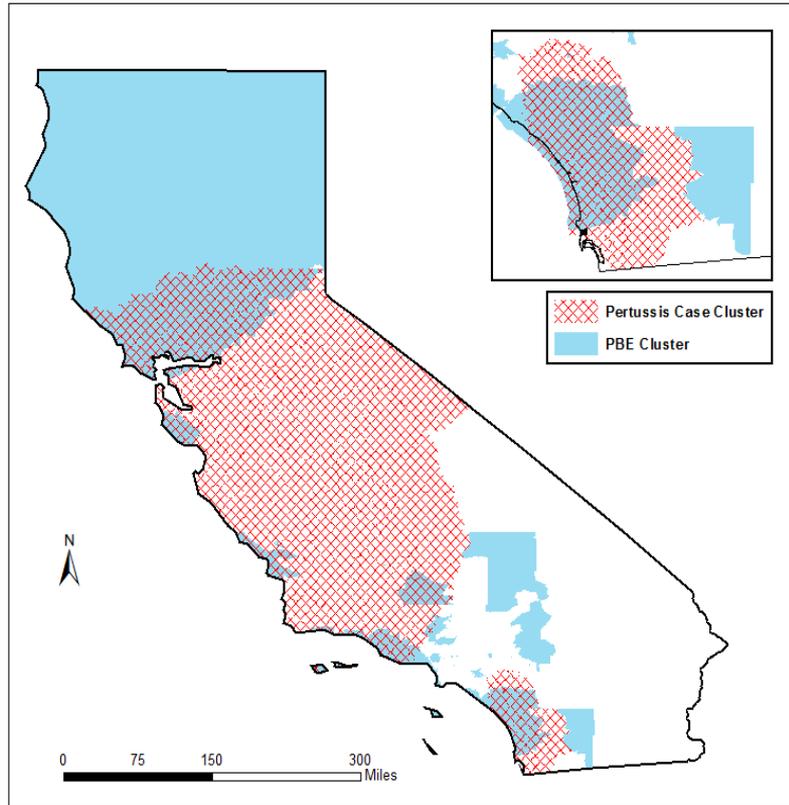
Unadjusted OR

3.0 (2.5 – 3.6)

Adjusted OR

2.7 (2.2 – 3.3)

Relative Locations of Pertussis Space-time Clusters & Exemptions Spatial Clusters –California (2010)



Overlap of Exemptions & Pertussis Clusters

Adjusted OR

2.5 (2.2 – 2.8)

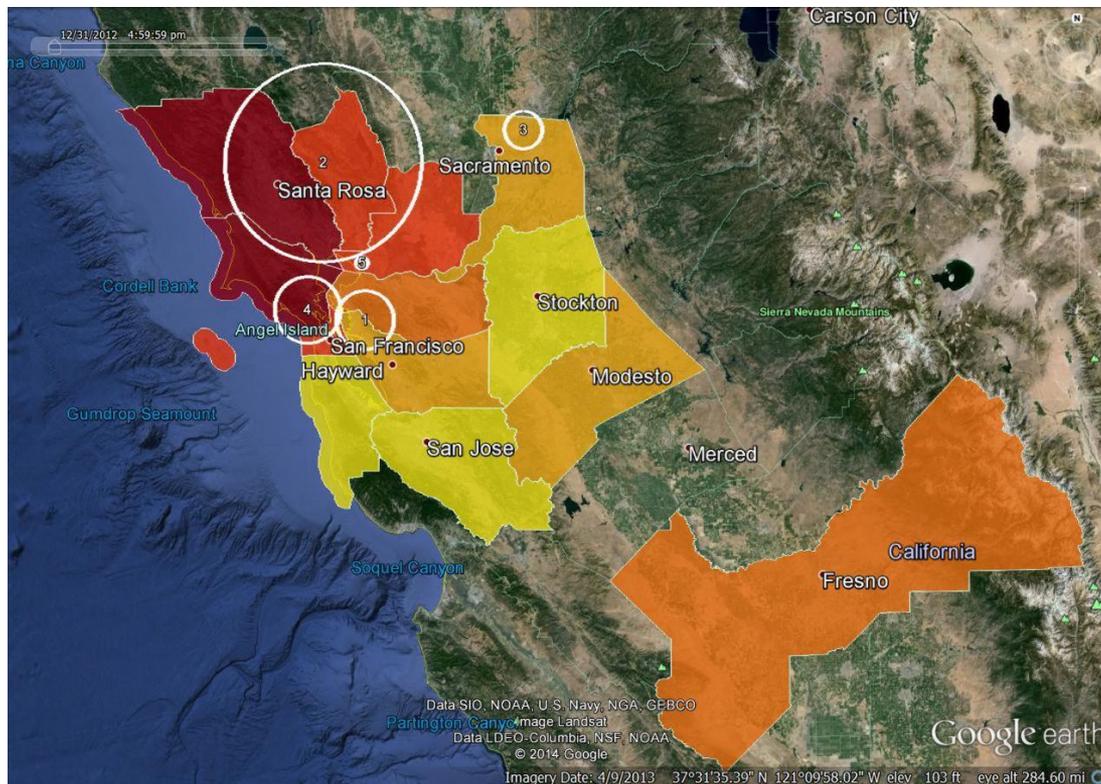
Comparison of Pertussis Incidence Inside vs. Outside Exemption Clusters

Adjusted IRR

1.2 (1.1 – 1.3)

Atwell et al., Pediatrics., 2013

Clusters of underimmunization, Kaiser Permanente Northern California, 2010–2012.



Tracy A. Lieu et al. *Pediatrics* 2015;135:280-289

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Possible Interventions

Summary

Summary: Limitations and Utility of Exemption Data

- Active decision on vaccinating or filing for exemption
- A few limitations
 - Should be interpreted in the context of other options
- Should be used judiciously
 - Useful for longitudinal data & clusters
- Capitalize on existing infrastructure

Acknowledgements

- Bob Bednarczyk
- Kristen Allen

Thank You!

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DISCUSSION



Welcome to the
September 2015 Meeting
of the
National Vaccine
Advisory Committee

Great Hall
Hubert H. Humphrey Bldg
200 Independence Avenue SW
Washington, DC 20201

