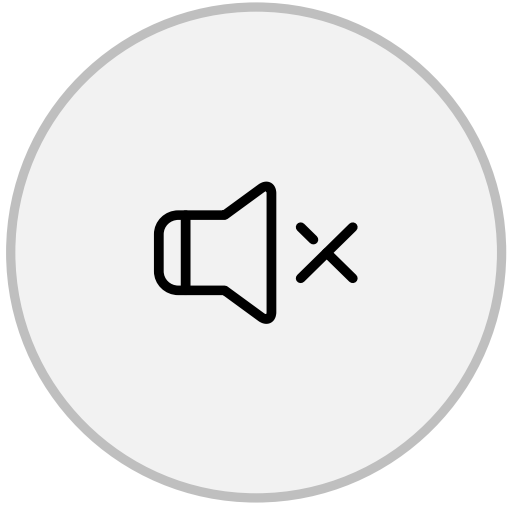
AIRA
AMERICAN IMMUNIZATION REGISTRY ASSOCIATION

IIS/NIS Match Project

Discovery Session

March 23, 2020

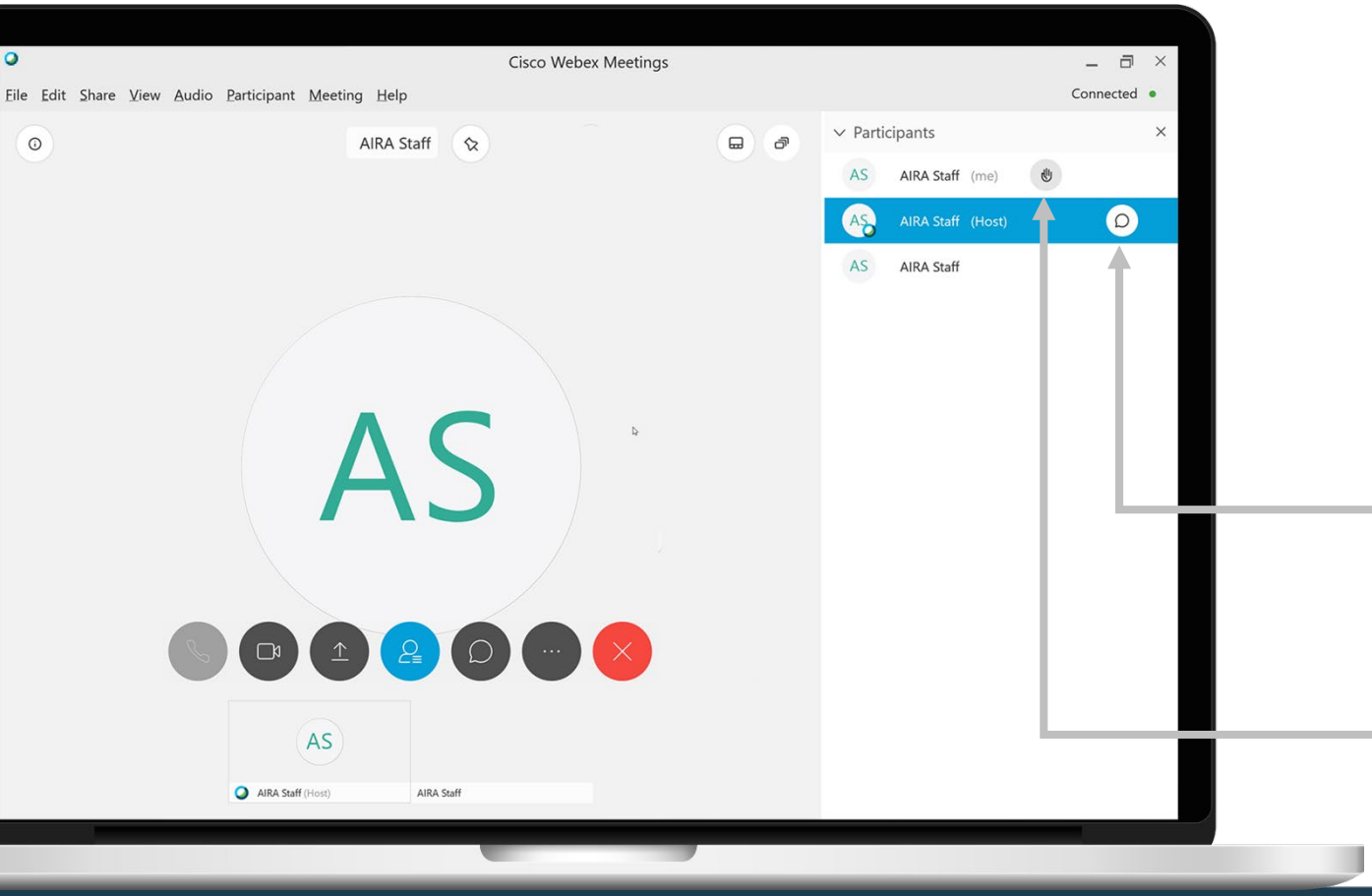
AIRA Discovery Session



All phone lines
are muted

This meeting is being recorded
and will be posted on the
AIRA repository

AIRA Discovery Session



- **How do I ask a question?**
  - There will be time allotted for Q&A following each of the updates, to unmute your line press *6
  - Via WebEx:

Select the chat icon next to the host and type question into the chat box.

Select the hand icon next to your name and you will be called on.

Today’s Topic

- IIS/NIS Match Project
- Questions, Comments, Discussion

Today's Speakers

- James Singleton, CDC
- Elizabeth Allen, NORC
- LaTreace Harris, CDC

Introduction to IIS-NIS Matches

AIRA Discovery Session

March 23, 2020

Presented by James A. Singleton, PhD
Assessment Branch, Immunization Services Division

Identifying Immunization Pockets of Need – Small Area Analysis of IIS Data to Detect Undervaccinated Populations

Featured Resource

★★★★★

Issued on September 28, 2018 by AIRA

This document explores how to use small area analysis to find pockets of need and provides strategies for responding to pockets of need

https://repository.immregistries.org/resource/identifying-immunization-pockets-of-need-small-area-analysis-of-iis-data-to-detect-undervaccinated-p/

Identifying Immunization Pockets of Need – Small Area Analysis of IIS Data to Detect Undervaccinated Populations

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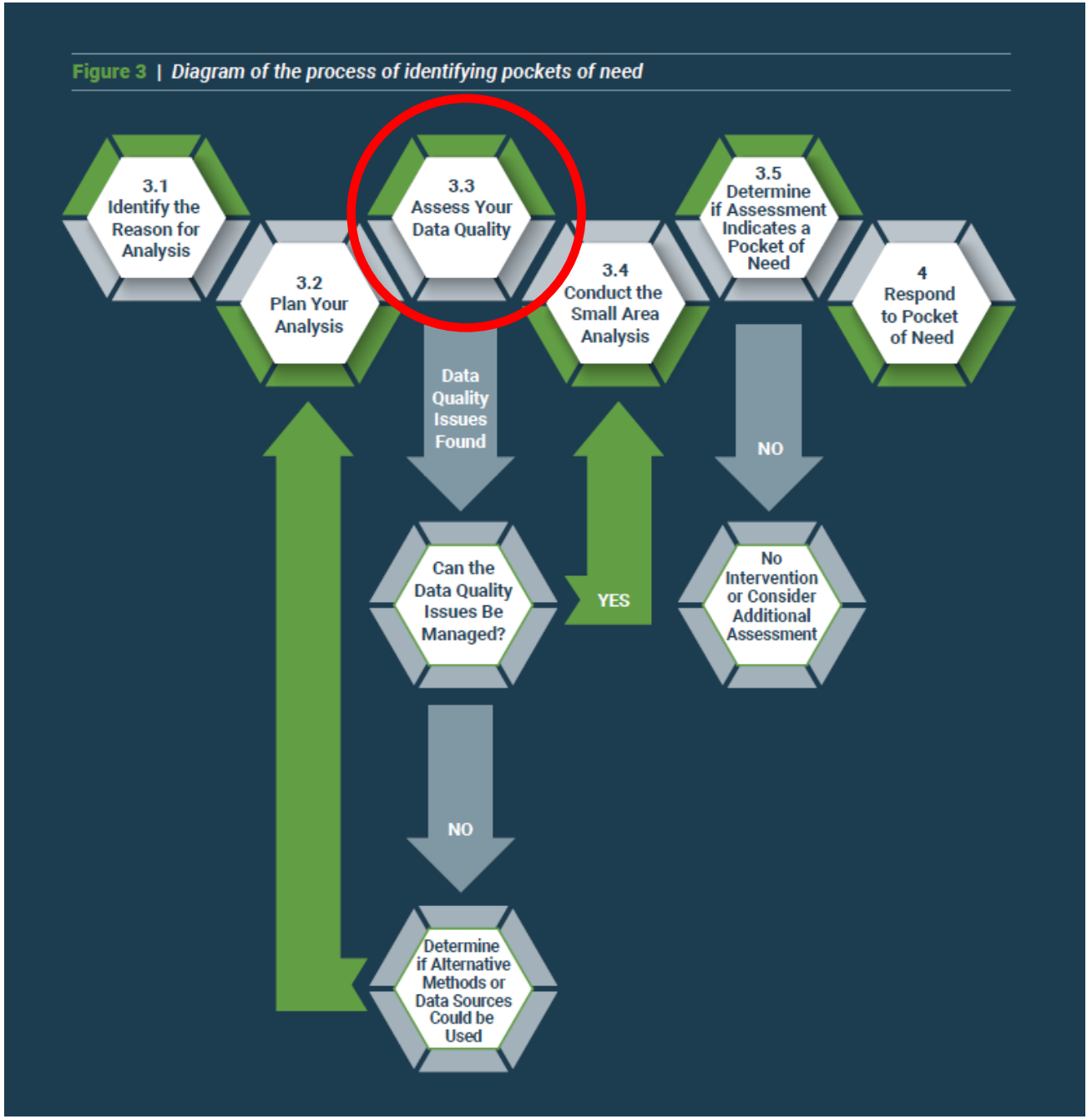
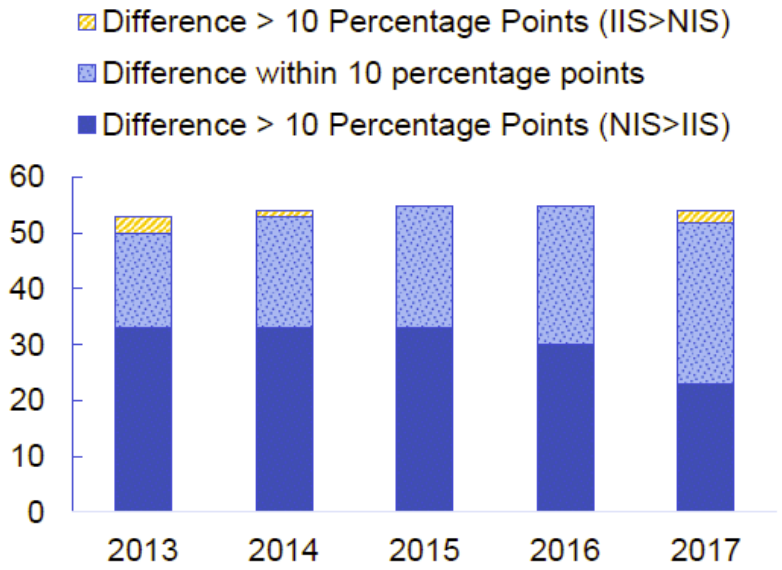


Possible Causes of Error in IIS-based Vaccination Coverage Estimates

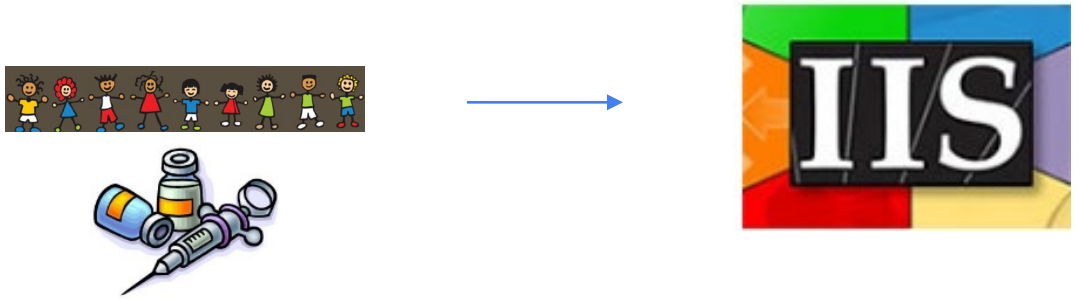
- Does the IIS accurately represent the jurisdiction's resident population?
  - Are all residents included in the IIS? (population completeness)
    - Or, are the residents included representative of the population?
  - Are there active IIS records for children who are not current residents?
    - Moved or gone elsewhere, deceased, duplicates
- Does the IIS accurately represent a child's vaccination history?
  - Are all vaccinations for a child reported to the IIS? (vaccination completeness)
  - Are vaccinations reported for a child correct?

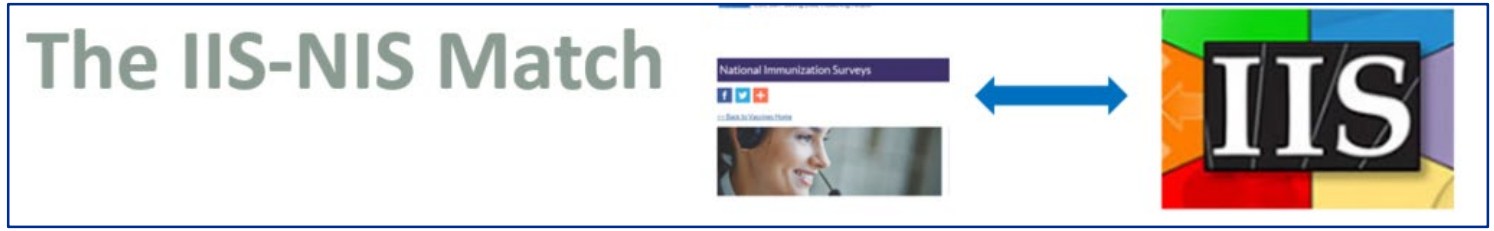
Ways to Assess IIS Data Completeness

Percentage Point Differences between NIS-Child and IISs for Combined 7-vaccine series Completion – IIS Annual Report, US, 2013–2017



Incomplete population and/or incomplete vaccination history?



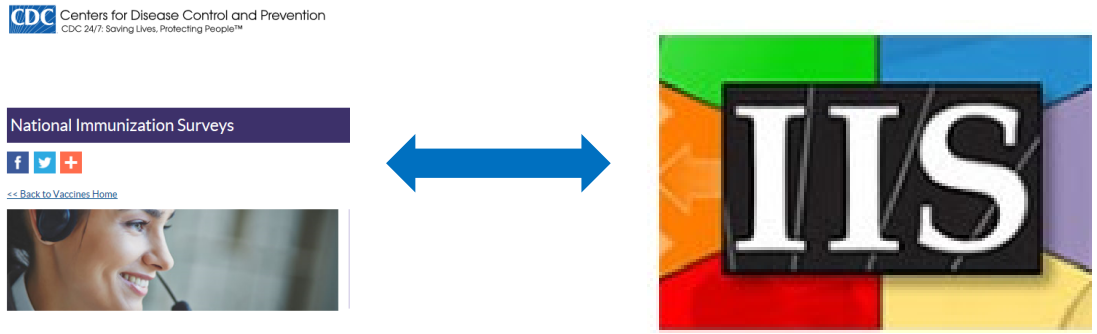


Assesses incomplete vaccination histories only

Matching Children from NIS to IIS

Let’s see how compatible we are …

The IIS-NIS Match



- Compares IIS quality and completeness with data collected through NIS (Child or Teen)
- Evaluates:
  - Completeness of population included in IIS
  - Completeness of IIS vaccination records for matched children
  - Characteristics of children with incomplete IIS vaccination records
- Requires data sharing agreement with NIS contractor

ARTICLE

Assessment of Immunization Registry Databases as Supplemental Sources of Data to Improve Ascertainment of Vaccination Coverage Estimates in the National Immunization Survey

Meena Khare, MS; Linda Piccinino, MPS (ID); Lawrence E. Barker, PhD; Robert W. Linkins, MPH, PhD

Objective: To evaluate the use of immunization registry data to supplement missing or incomplete vaccination data reported by immunization providers (referred to as "providers" hereafter) in the National Immunization Survey.

Design: Cross-sectional, random-digit–dialing, telephone survey to measure vaccination coverage among children aged 19 to 35 months in the United States.

Setting: Four sites with mature (with >67% of provider participation in the area) immunization registries.

Participants: Of the 639 children with complete household interviews, interviewers had consent from the respondents for 569 (89.0%) children to contact their providers and for 556 (87.0%) children to contact both providers and registries.

Main Outcome Measures: Percentages of children up-to-date for vaccines based on data from providers, registries, and both sources combined.

Results: According to provider-reported data, weighted estimates of coverage for the recommended childhood vaccine series 4:3:1:3 at the 4 sites were 65.6%, 78.8%, 81.6%, and 77.0%. According to registry data, these coverage rates were consistently lower: 31.7% ($P<.05$), 65.4%, 71.9%, and 61.8%, respectively. When all unique vaccine doses were combined from both sources, the pooled 4:3:1:3 coverage rates increased to 72.0%, 92.0%, 88.7%, and 80.2%, respectively. The quality and completeness of vaccination histories from the registries were inconsistent and varied by sites.

Conclusions: Vaccination coverage estimates were the lowest when only registry-reported data were used and were the highest when provider- and registry-reported histories were combined. Although registries enrolled and matched more children, vaccination histories were missing, incomplete, and inconsistent. The quality and completeness of the registry data must be improved and must be comparable across all states before further consideration may be given to supplement or replace the provider-reported National Immunization Survey data.

Arch Pediatr Adolesc Med. 2006;160:838-842

Participation in IIS-NIS Match

Opportunity for IIS-NIS Match	Number of Areas Participating
Awardees requested match using cooperative agreement funds, 2008-2017	18
CDC offered to pay for matches of 2017 NIS-Child and NIS-Teen data to 30 IIS with child series coverage estimates within 10 percentage points of NIS-Child estimate	21
CDC offered to pay for matches of 2019 NIS-Child and NIS-Teen data to 12 IIS participating in 2019 IIS-NIS integration	9
Awardees can request match in 2020 CoAg	?

The Path to Full IIS-NIS Integration

Phase 1

- Phone numbers from IIS augment the NIS cell phone RDD sampling frame
- Vaccination data collected via the NIS provider record check (PRC)

Phase 2

- IIS serves as the sole sampling frame (RDD frame dropped)
- Vaccination data collected via the NIS PRC

Phase 3

- IIS serves as the sole sampling frame
- Vaccination data collected from both NIS PRC and IIS

Phase 4

IIS serves as the sole sampling frame
Vaccination data collected from IIS only (drop the NIS PRC)

Role of IIS-NIS Match in IIS-NIS Integration

Phase 1
- Phone numbers from IIS augment the NIS cell phone RDD sampling frame
- Vaccination data collected via the NIS provider record check (PRC)

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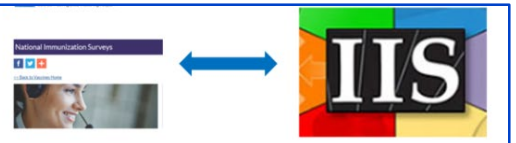
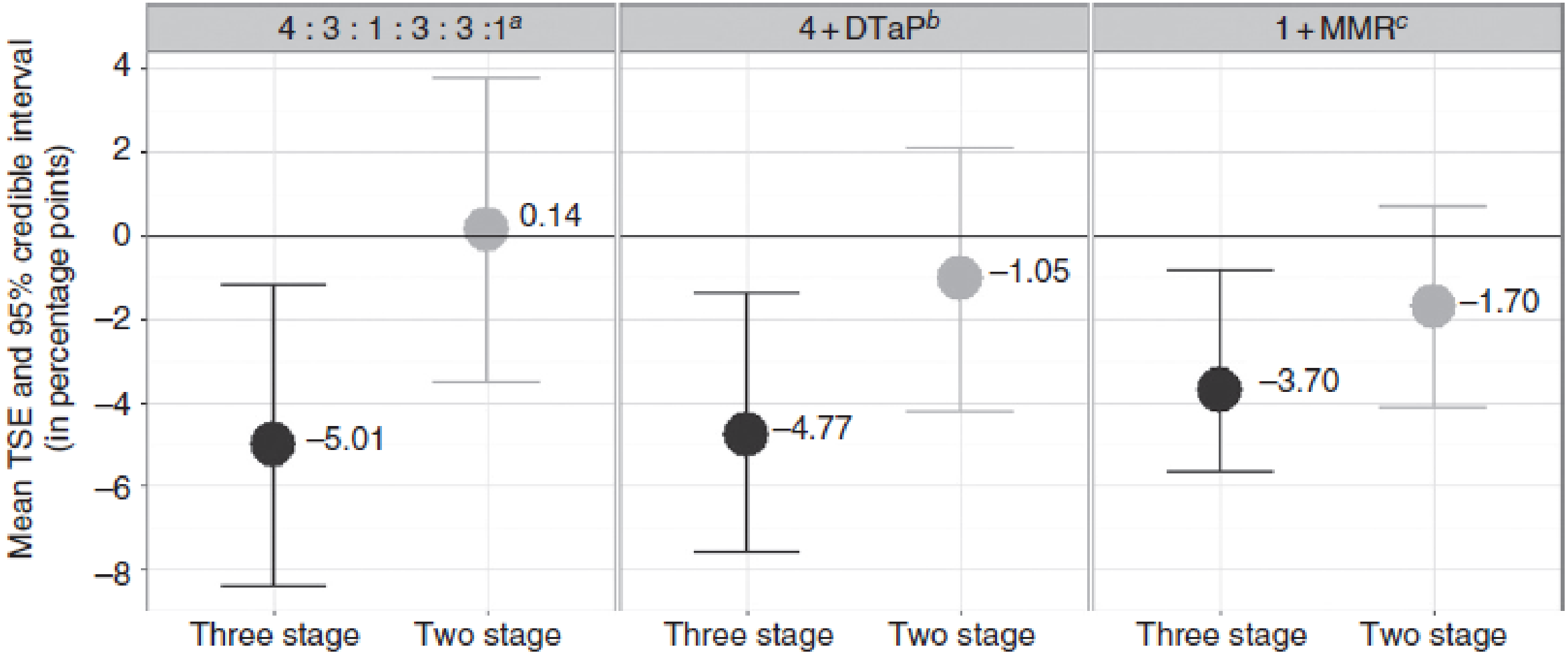
Vaccination data collected from IIS only (drop the NIS PRC)

The IIS-NIS Match



Role of IIS-NIS Match in Evaluating NIS Error

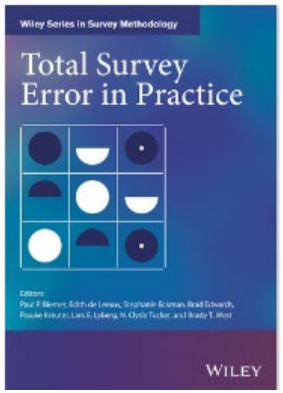
- Using matched IIS and NIS data, create synthesized vaccination history for each child
- Compare the vaccinations reported to NIS with the synthesized “gold standard” vaccination history to determine level of under ascertainment
- Feed the under ascertainment level into a “total survey error” model
- These models indicate that NIS estimates may be too low, mainly because of vaccination under ascertainment
- IIS-NIS match data are therefore critical in evaluating NIS error
- Ongoing NIS error is critical for assessing ongoing viability of the NIS



Total Survey Error Assessment for Sociodemographic Subgroups in the 2012 U.S. National Immunization Survey

Kirk M. Wolter,[1] Vicki J. Pineau,[1] Benjamin Skalland,[1] Wei Zeng,[1] James A. Singleton,[2] Meena Khare,[3] Zhen Zhao,[2] David Yankey,[2] and Philip J. Smith[2]

[1] *NORC at the University of Chicago, Chicago, IL, USA*
[2] *National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, GA, USA*
[3] *National Center for Health Statistics, Centers for Disease Control and Prevention, Hyattsville, MD, USA*



Thank You
Questions?

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

IIS-NIS Match Report Process and Results

Elizabeth Allen
NORC at the University of Chicago

AIRA Discovery Session
March 23, 2020

NORC at the UNIVERSITY of CHICAGO

Agenda

- Background
- IIS-NIS Match Report Process Overview
- IIS-NIS Match Report Summary

Background

Background

NIS-Child Overview

- Sponsored by the Centers for Disease Control and Prevention (CDC)
- Monitors vaccination coverage rates for children 19-35 months
- Nationwide cell-phone random-digit-dial (RDD) survey
- National, state, and selected local area and U.S. territory estimates of vaccination coverage using a standard methodology
- Two phase data collection: household and child's provider(s)
  - Household telephone interview to obtain data on child, mother, and household and to gain consent to contact health care providers
  - Providers mailed an Immunization History Questionnaire (IHQ) for detailed vaccination records

Background

IIS Overview

- Immunization Information Systems (IISs) are state or local confidential, computerized, population-based data systems that collect and consolidate vaccination doses administered to individuals by participating vaccination providers
  - IISs exist in 50 states, five large cities, the District of Columbia, and 8 territories
- Functional standards established in the 1990s
- Varying levels of completeness of the population of children 19-35 months
- Varying levels of completeness of child vaccination histories for children included in the IIS

Background

IIS Overview

- Strengths of IIS
  - Large sample size (aspiration is to include all children in the population)
  - Many IISs have high levels of completeness for children 19-35 months
  - Timely estimates can be computed
- Challenges
  - Inconsistent methods of populating the dataset and/or administration of system
  - Incomplete database
    - Missing children and/or missing vaccination doses
  - Difficult to assess true population coverage and vaccination coverage rates
    - For example, children who have moved or gone elsewhere (MOGE) typically remain in IIS databases and are reflected in the numerator of IIS vaccination coverage rates (and denominator if Census estimate not used)
  - Uncertain completeness and accuracy of contact information

IIS-NIS Match Report Process Overview

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IIS-NIS Match Report Process Overview

Process Steps

- IIS-NIS match projects offer ability to compare and assess the quality and completeness of the IIS data to data collected in the NIS-Child and NIS-Teen

- Steps involved for Awardee's participation:
  - Indicating interest in participation
  - Obtaining DUA, legal review, IRB review, and other approvals
  - Extracting and uploading file of child level demographic, provider, and immunization data

IIS-NIS Match Report Process Overview

Process Steps: Awardees

- First step: Indicate Interest!

- Second Step: Legal Oversight
  - Data Use Agreement (DUA) process
    - NORC has standard DUA, but may need to be revised depending on requirements of a state
    - Purpose is to protect the exchange of data, as well as the data itself
  - Legal Review
  - IRB review
  - Other Approvals

IIS-NIS Match Report Process Overview

Process Steps: Awardees

- Final Step: Data Files
  - Extract data file of child level demographic, provider, and immunization data
    - NORC will provide specifications for data and fields that are needed
  - Exchange data file via a secured FTP site
  - In some cases, data sharing is limited; NORC can work with individual awardees about how to handle these situations

IIS-NIS Match Report Process Overview

Process Steps: CDC and NORC

- Steps involved for CDC and NORC:
  - Setting up specifications files for awardees
  - Obtaining IRB approval for the project
  - NORC Data Governance Board reviewing each DUA with awardees.
  - Setting up a SFTP site for data exchange (or other mechanism for data exchange)

IIS-NIS Match Report Process Overview

Process Steps: CDC and NORC

- Steps involved for CDC and NORC:
  - Receiving data files, quality checks, matching the NIS consented children with the IIS universe of children and conducting analyses on the matched cases.
    - During the NIS-Child household interview, respondents are asked for permission to contact both the child's vaccination providers and their local immunization registry
    - For respondents with consent to contact the IIS, NORC matches the NIS-Child children to children in the IIS database, using both automated and manual review of exact and "likely" matches
  - Production of IIS-NIS Match Report

IIS-NIS Match Report Summary

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IIS-NIS Match Report Summary

- Report is approximately 35 pages with written summaries in addition to tables and charts
- Report Outline
  - Introduction
  - Description of the IIS-NIS Match Project
  - Evaluating IIS participation
  - Evaluating the number of doses in the IIS
  - Comparing IIS Vaccination Coverage Estimates to Gold-Standard Vaccination Coverage Estimates
  - Summary
  - Appendices: detailed tables

IIS-NIS Match Report Summary

Evaluating IIS Participation

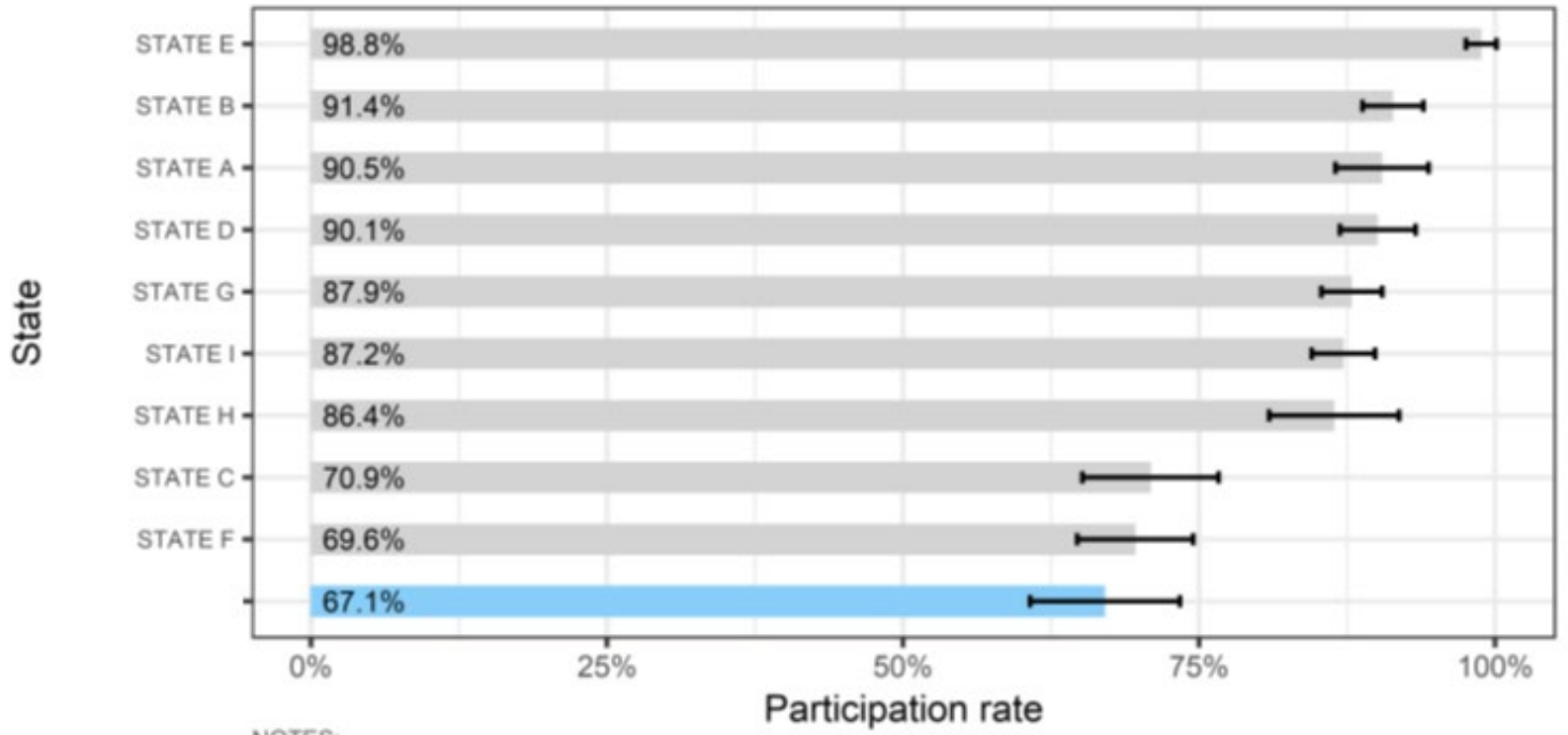
- Participation Rate: percentage of children residing in the state that are in the IIS with two or more vaccine doses recorded in the IIS
  - Overall participation rate is the product of the enrollment rate and the conditional participation rate
- Enrollment Rate: percentage of children in the IIS out of the children residing in the state
- Conditional Participation Rate: percentage of children with 2+ doses in the IIS, of the children enrolled in the IIS
- Based on sample from NIS-Child and not all children in the IIS

IIS-NIS Match Report Summary

Evaluating IIS Participation

- Comparison of participation rate to states from prior years

Figure 1: IIS Participation Rate Estimates by State



NOTES:
1. The chart presents participation rate estimates and 95% confidence intervals.
2. The participation rate is defined as, of children age 19-35 months living in the state, the percentage that are in the IIS with two or more doses in the IIS.
3. Estimates are computed among children with consent to contact the IIS and are weighted by the final NIS-Child household-phase weight.
4. Comparison states shown are those that participated in an IIS-NIS Match Project between 2010 and 2016. These states are self-selecting and not necessarily representative of all states.

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IIS-NIS Match Report Summary

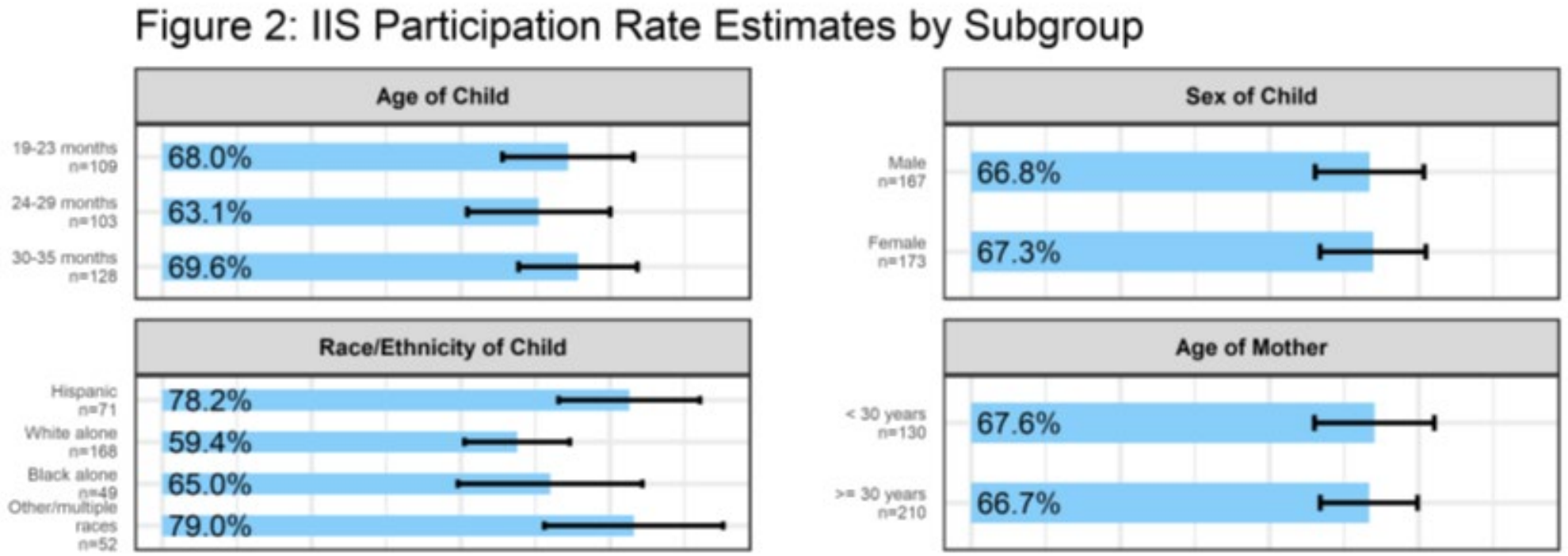
Evaluating IIS Participation

- Comparison of participation rate by demographic subgroups
  - Age of child
  - Sex of child
  - Race/ethnicity of child
  - Age of the child's mother
  - Education level of the child's mother
  - Marital status of the child's mother
  - Income-to-poverty ratio of the child's family
  - Change of address since the child's birth
  - MSA status of child's residence
  - Child insurance status
  - Number of providers nominated for the child

IIS-NIS Match Report Summary

Evaluating IIS Participation

- Comparison of participation rate by demographic subgroups



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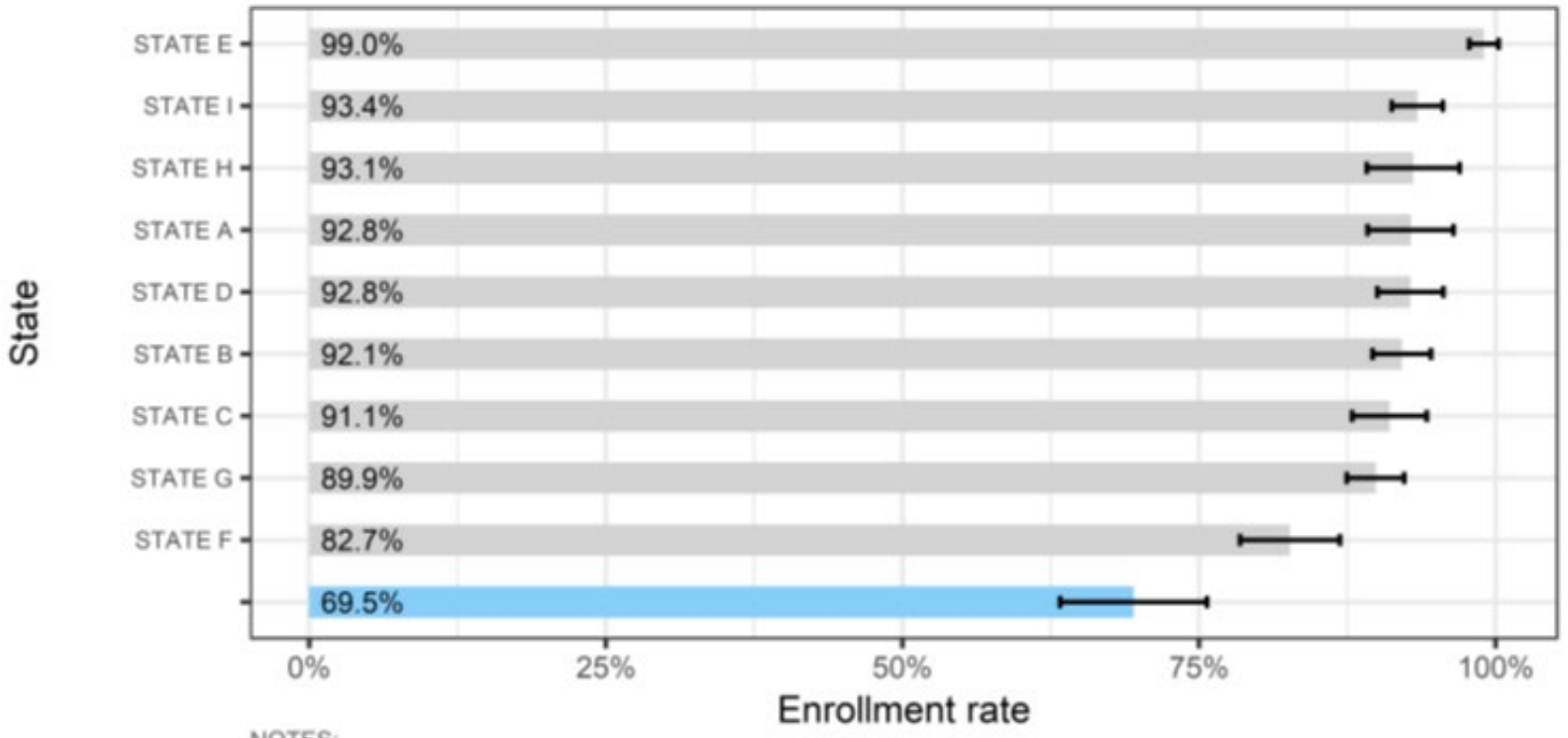
IIS-NIS Match Report Summary

Evaluating IIS Participation

- Comparison of enrollment rate to states from prior years

Figure 3: IIS Enrollment Rate Estimates by State



NOTES:
1. The chart presents IIS enrollment rate estimates and 95% confidence intervals.
2. The enrollment rate is defined as, of children age 19-35 months living in the state, the percentage that are in the state IIS.
3. Estimates are computed among children with consent to contact the IIS and are weighted using the final NIS-Child household-phase weight.
4. Comparison states shown are those that participated in an IIS-NIS Match Project between 2010 and 2016. These states are self-selecting and not necessarily representative of all states.

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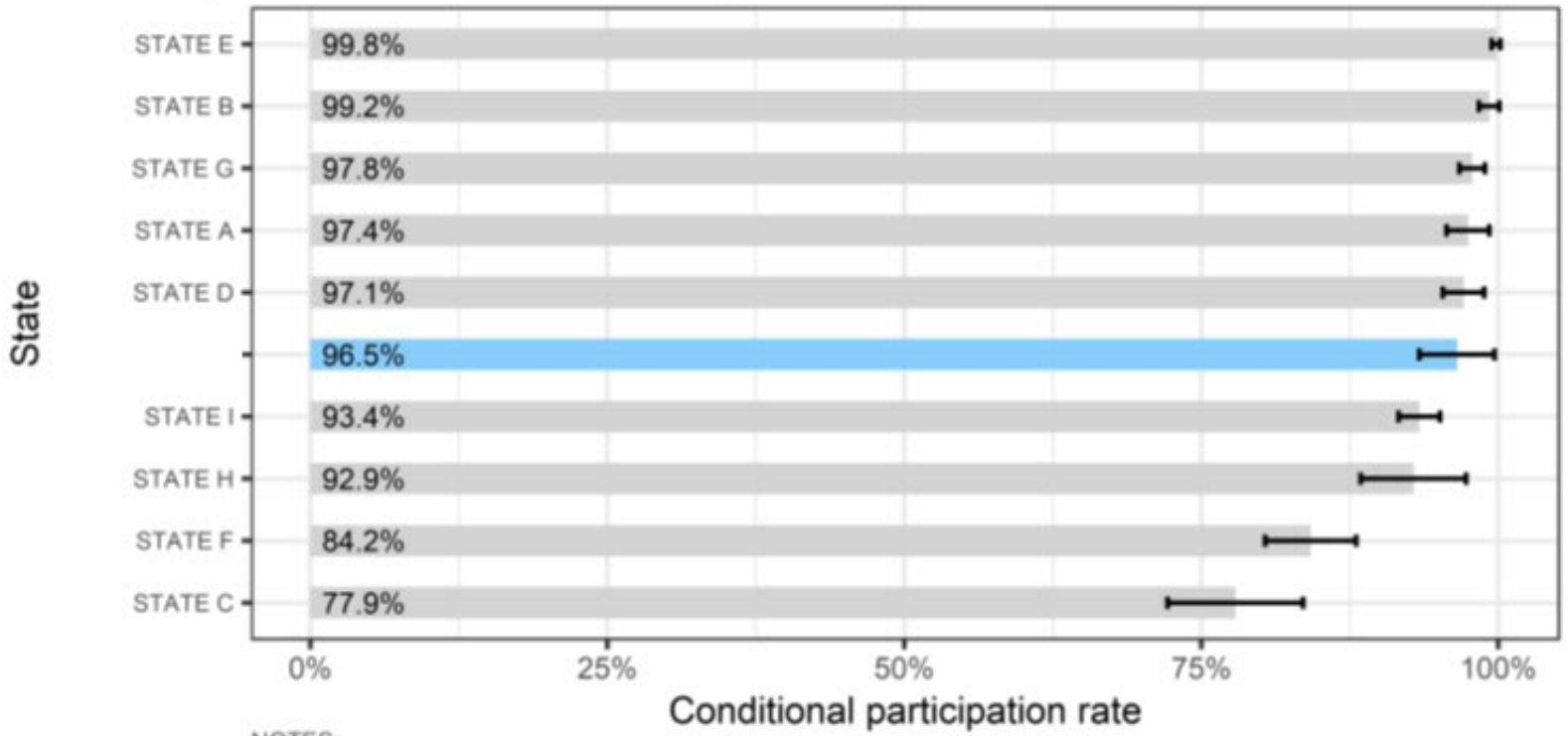
IIS-NIS Match Report Summary

Evaluating IIS Participation

- Comparison of conditional participation rate to states from prior years

Figure 5: IIS Conditional Participation Rate Estimates by State



NOTES:
1. The chart presents conditional participation rate estimates and 95% confidence intervals.
2. The conditional participation rate is defined as, of children age 19-35 months living in the state that are enrolled in the IIS, the percentage that have two or more doses in the IIS.
3. Estimates are computed among children found in the IIS and are weighted by the final NIS-Child household-phase weight.
4. Comparison states shown are those that participated in an IIS-NIS Match Project between 2010 and 2016. These states are self-selecting and not necessarily representative of all states.

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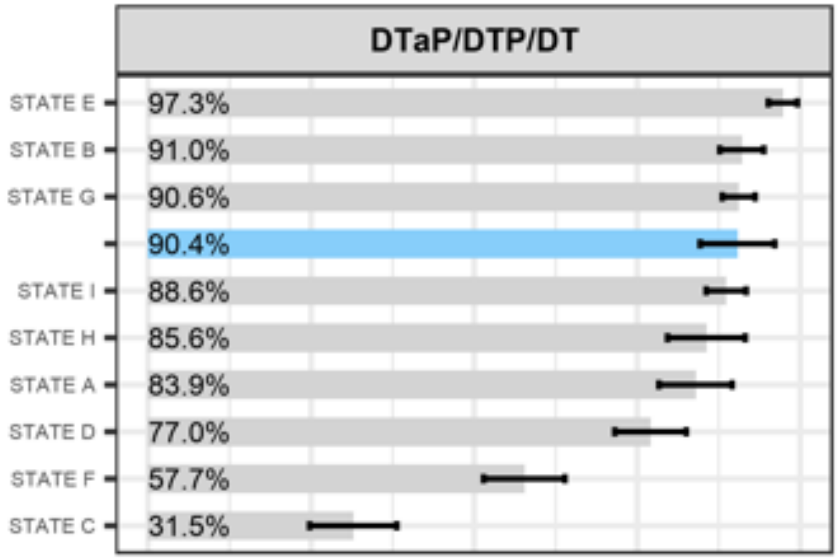
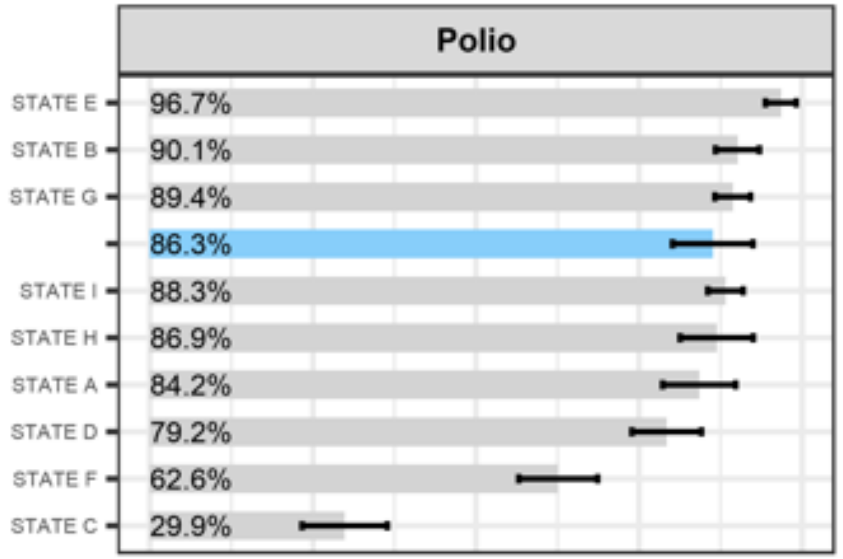
IIS-NIS Match Report Summary

Evaluating the number of doses in the IIS

- IIS dose completeness rate is the percentage of children in the IIS for which the IIS contains all of the doses of vaccine the child has received
- Comparison of dose completeness rate by vaccine to states from prior years
  - Separate graphs comparing completeness rate for 7-series by subgroups

Figure 7: IIS Dose Completeness Rate Estimates by State and Vaccine

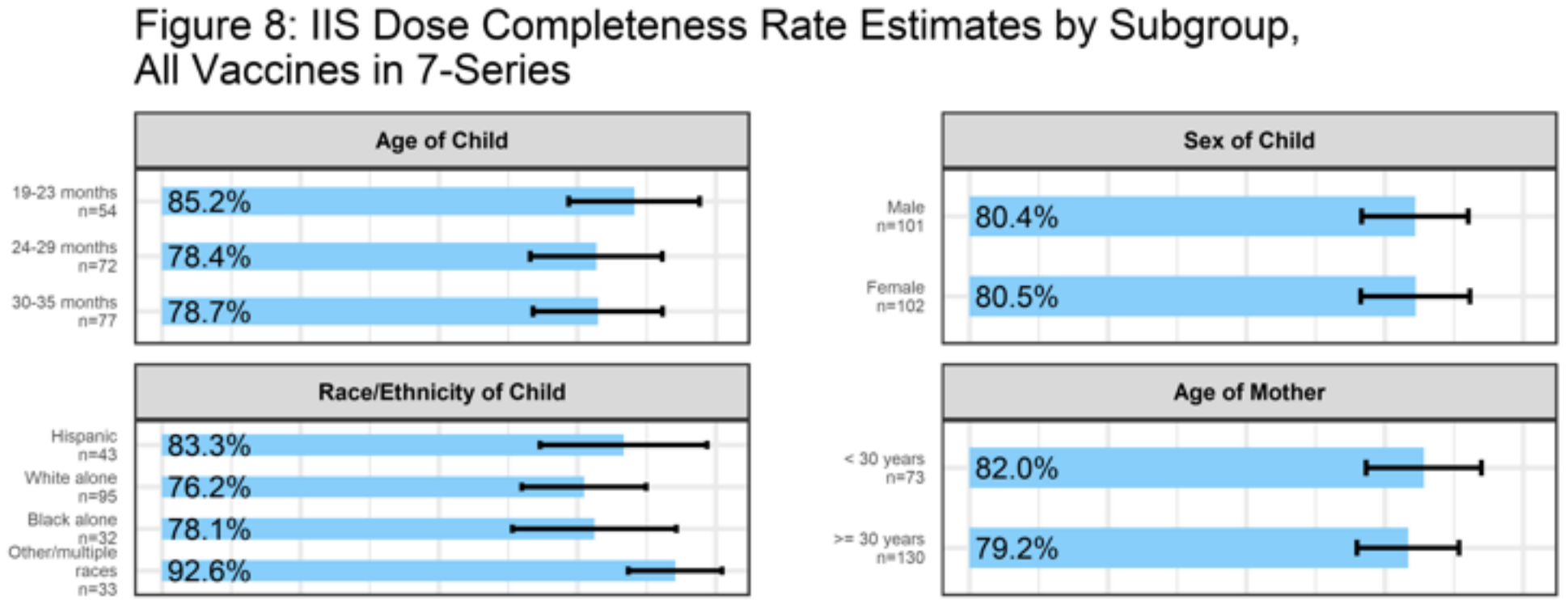




IIS-NIS Match Report Summary

Evaluating the number of doses in the IIS

- Comparison of dose completeness rate for 7-series by subgroups of interest



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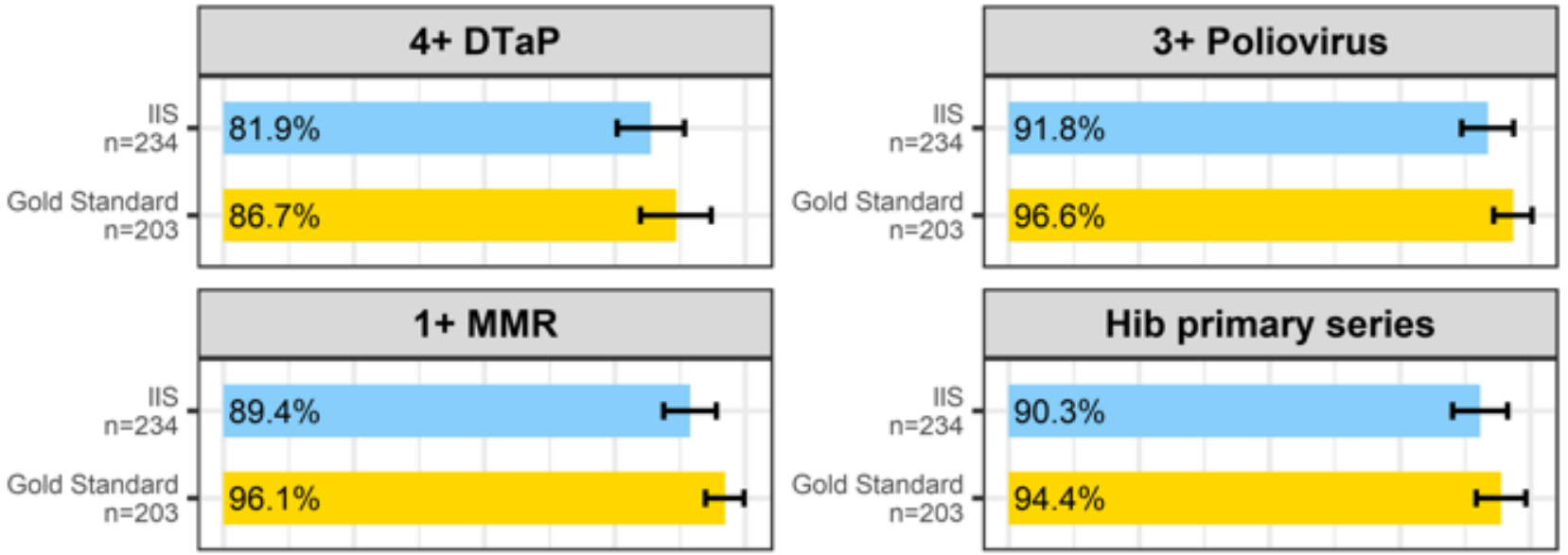
IIS-NIS Match Report Summary

Comparing IIS to Gold-Standard Vaccination Coverage Estimates

- Comparison of IIS vaccination coverage estimates to the Gold-Standard estimates
  - Gold-Standard vaccination coverage estimates are based on the combined NIS-Child and IIS vaccination history for matched children with adequate provider data

Figure 9: IIS vs. Gold-Standard Vaccination Coverage Estimates

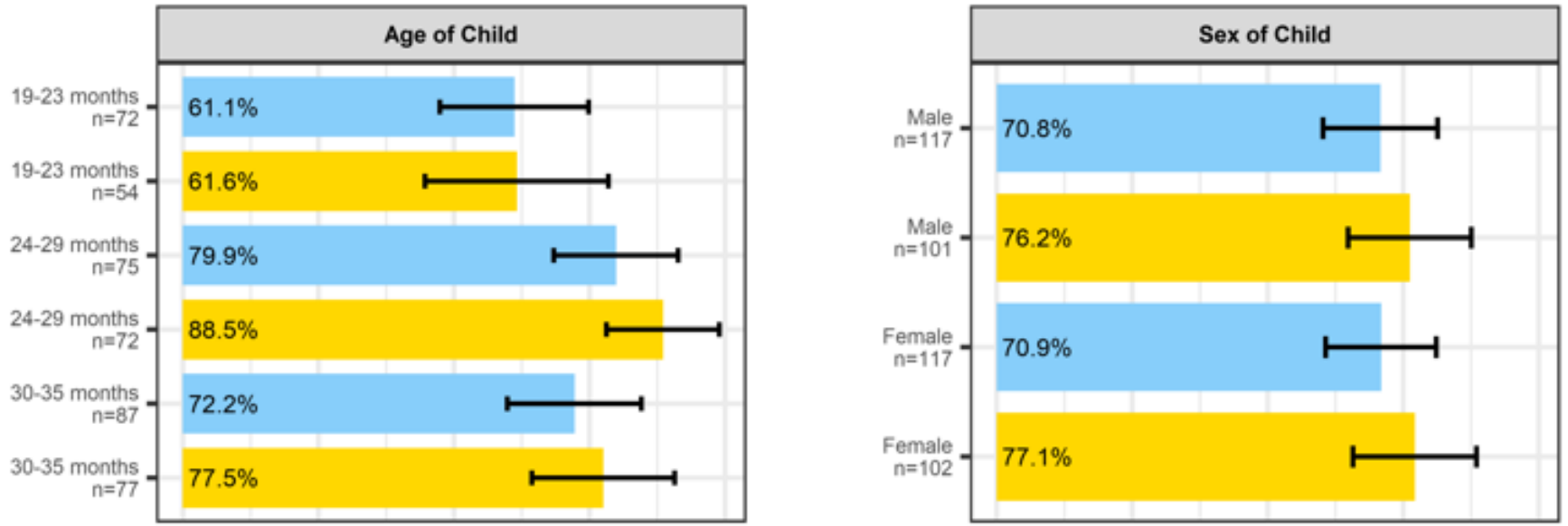


IIS-NIS Match Report Summary

Comparing IIS to Gold-Standard Vaccination Coverage Estimates

- Comparison of IIS vaccination coverage estimates to the Gold-Standard estimates by subgroup

Figure 10: IIS vs. Gold-Standard Vaccination Coverage Estimates by Subgroup, 7-Series



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Elizabeth Allen
allen-elizabeth@norc.org

Thank You!

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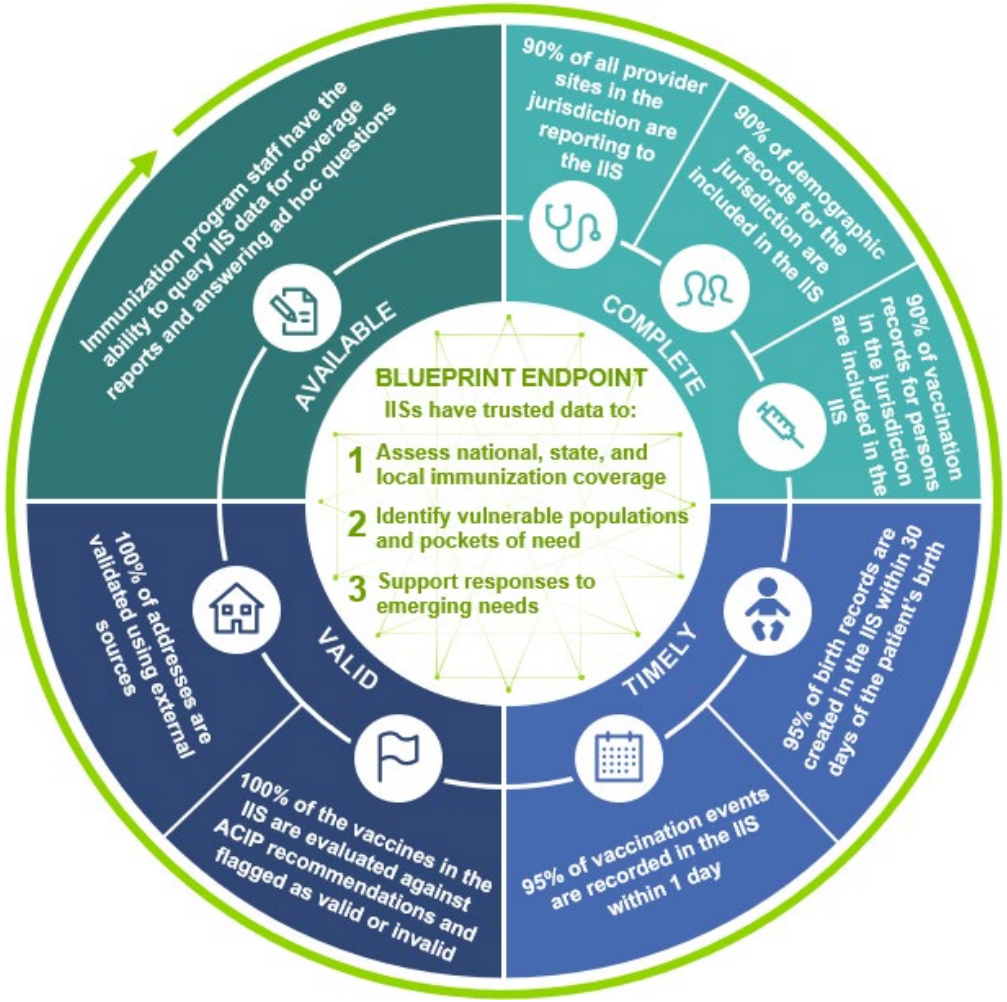
insight for informed decisions™

A Virtuous Cycle

Making IIS data available helps create a virtuous cycle to improve IIS data completeness, timeliness, validity, accuracy, uniqueness, and consistency. *You don't have to wait for perfect data to use it!*

The Blueprint endpoint defines IISSB's vision for improving IIS data quality



Endpoint

- IISs will be ***the* trusted source** for reliable immunization data
- As the trusted source, IISs will produce data to support:
  - ***Immunization coverage assessments***
  - ***Identification of pockets of need***
  - ***Responses to emerging needs***

How the IIS-NIS Match Aligns to the IIS Data Quality Blueprint and IIS Dashboard

- Assists in the development of strategies for addressing the completeness of IIS Data:
  - Blueprint Milestone: 90% of demographic and vaccination records for the jurisdiction are included in the IIS
    - Fig.8 in IIS-NIS Match Report: IIS has records for all the vaccinations for each child in the sample for the jurisdiction, by subgroups

How the IIS-NIS Match Aligns to the IIS Data Quality Blueprint and IIS Dashboard

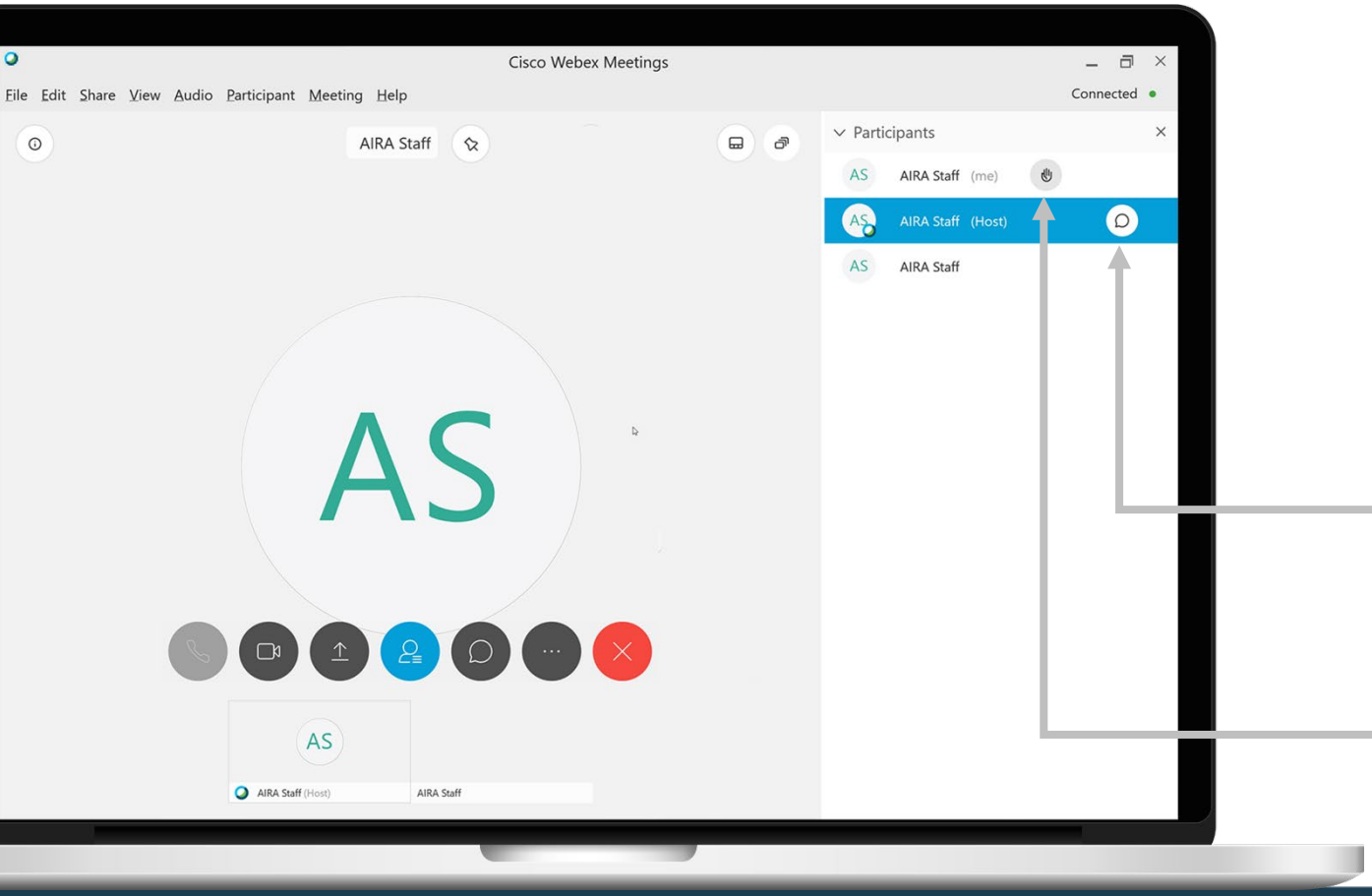
- Assists in verifying IIS population capture and vaccination record establishment:
  - IIS Dashboard Measure: Percentage of children in the IIS that were born in the last calendar year residing in the IIS's jurisdiction at the time of query that have records created in the IIS from all sources
    - Table 1 of IIS-NIS Match Report: This table indicates whether the IIS has records for all the children in the sample for the jurisdiction

How the IIS-NIS Match Aligns to the IIS Data Quality Blueprint and IIS Dashboard

- Helps to assess the accuracy of IIS Data in comparison to national standard, and aligns with CC4 Component requirements:
  - 2018 IIS childhood 7-series vaccination coverage estimate shall be no more than 10 percentage points lower than the corresponding National Immunization Survey (NIS)-child estimate;
  - 2018 IIS Td-Tdap vaccination coverage estimate for adolescents shall be no more than 10 percentage points below the corresponding NIS-teen estimate;

Questions, Comments, Discussion?

Questions, Comments, Discussion?



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Thank you to our presenters, and thanks to all of you for joining us!

A brief evaluation survey will be sent out following this webinar

The next Discovery Session will be

April 27th at 4pm ET