



# IIS Data Use in Low-Resource Settings: Assessment, Outbreak Response, and Evaluation

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# Outline

- Background
- IIS data use in low resource settings
  - Coverage assessment
  - Outbreak response
  - Project evaluation
- Summary
  - Strengths and limitations

**Background**

# United States Affiliated Pacific Islands (USAPI)

- **U.S. Territories**

- American Samoa
- Commonwealth of the Northern Mariana Islands (CNMI)
- Guam

- **Freely Associated Nations**

- Republic of the Marshall Islands (RMI)
- Republic of Palau
- Federated States of Micronesia (FSM)

# Health System Threats



# Addressing Challenges

- Vaccine-preventable diseases (VPD) present a substantial public health risk in the USAPI
- IIS can inform vaccination activities:
  - Assess population coverage
  - Identify under-vaccinated populations and individuals
  - Evaluate interventions

# IIS Benefits in Low Resource Settings



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  - Protect vulnerable populations
  - Streamline operations
    - Decrease costs
  - Increase coverage

# IIS Benefits in Low Resource Settings

- Limited resources and threats of VPD outbreaks require innovative approaches
- USAPI immunization programs have been leveraging IIS to meet their specific needs



# Health System Threats



# IIS Use in Low Resource Settings

Coverage Assessment

## ASSESSMENT METHODS



### DEFINE PROGRAM NEEDS



Date of Birth  
Range(s)



Demographic &  
Vaccination  
Indicators



Data Sources

### COLLECT DATA



Vital Statistics



Medical Records



Public Health Logs



School Rosters



IIS Records

### DATA ABSTRACTION



Create Digital  
Records



Secure Storage with  
Restricted Access



Data Abstraction  
& Entry

### ANALYSIS & REPORTING



Data Cleaning  
& Validation



Data Analysis



Report &  
Dissemination

## Coverage Assessment

- Public health and medical record abstraction
  - Primarily paper-based records
  - Objectives
    - Identify all children born or currently living in the jurisdiction
      - Identify children who have moved away
      - Identify children who are deceased
    - Identify all vaccination events

## ASSESSMENT METHODS



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## Coverage Assessment

- Strengths
  - Approximates a census of the population
  - Capture demographic and vaccination events across a variety of sources
- Limitations
  - Children may be excluded
  - Unreliable identification of children who have moved away or are deceased
  - Missing or discrepant identifying information across sources (e.g. name, caregiver names)

# Benefits of including supplemental IIS data to a coverage assessment

- Identify duplicates
  - Run possible patient duplicate report for cohort of interest
  - Supplemental identifying information can benefit manual duplicate search
- Identify children missing from denominator
  - Children who have moved in to the jurisdiction
  - Children living on outer islands or remote locations
- Identify missing vaccination events
  - Historical doses
  - Missing paper records



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## Possible Patient Duplicates

Enter the selection criteria and click "Run Report" or click "Cancel" to return to the previous page.



### Report Selection Criteria

Provider/Clinic : CHUUK STATE, WENO

SELECT A CLINIC BY TYPING PROVIDER, CLINIC, VFC PIN, OR CLINIC CODE



#### Duplicate Found Date Range

From: MM/DD/YYYY Through: MM/DD/YYYY

#### DOB Date Range

From: MM/DD/YYYY Through: MM/DD/YYYY

☐ Exclude Patients with no DOB?

☐ Include Only User-Identified?

Output Type ☒ PDF ☐ EXTRACT - Delimiter: |

Run Report

Cancel

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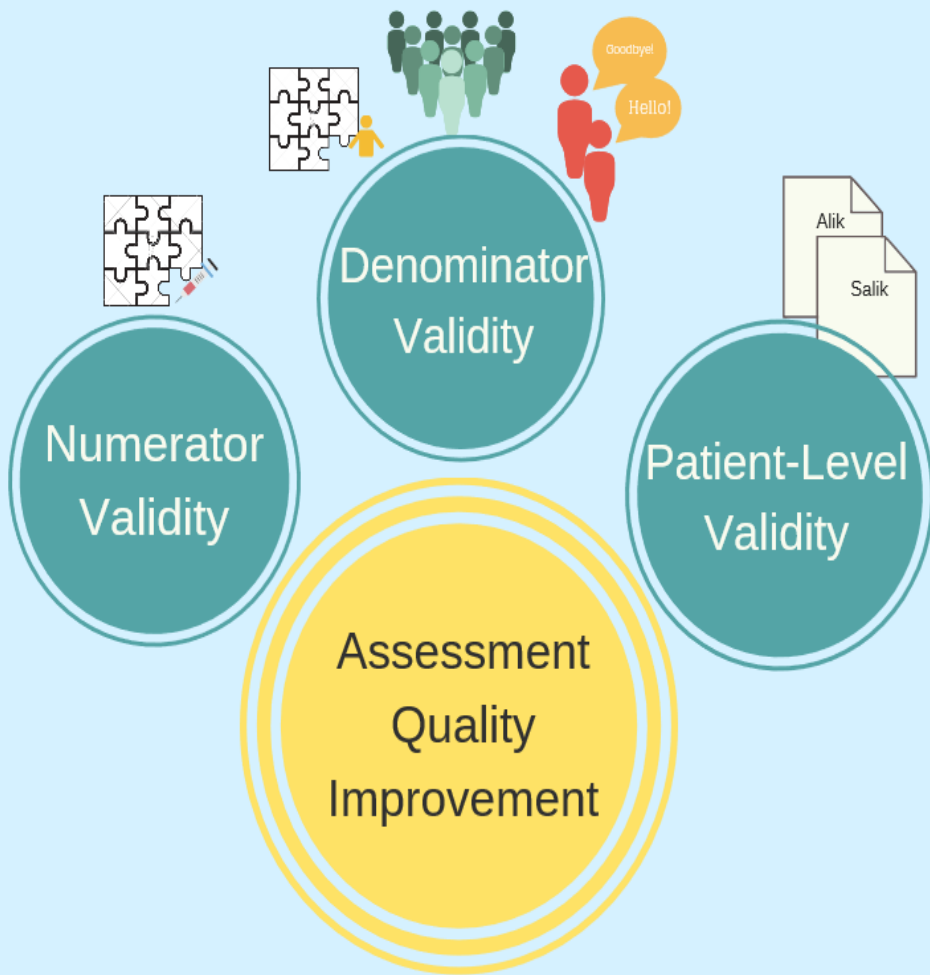
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# Benefits of including supplemental IIS data to a coverage assessment

- Resolve discrepancies between sources
  - Demographic information
  - Vaccination information
- More reliably identify patient active/inactive status
  - Moved away
  - Moved back
  - Deceased
  - Inactive for a prolonged period of time

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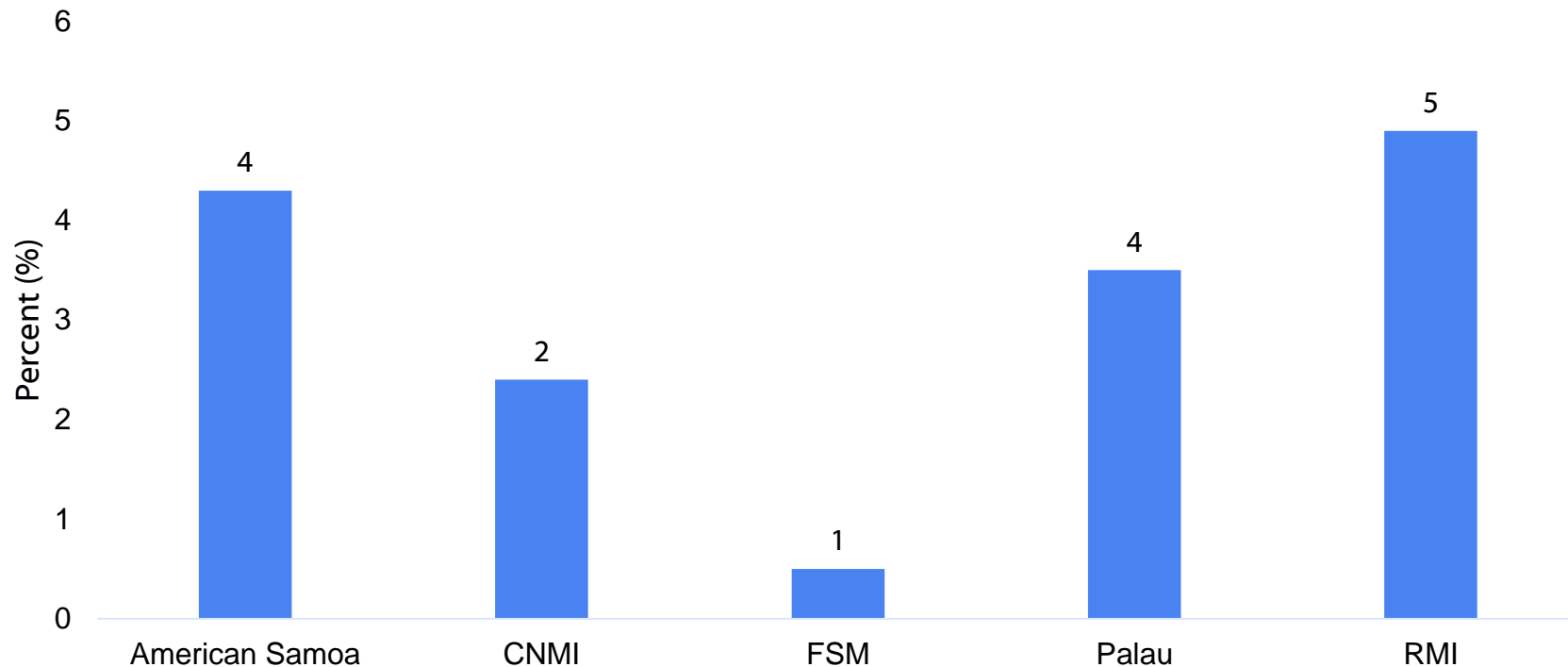
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## Impact on Assessment

- Improved numerator validity
- Improved denominator validity
- Improved patient-level data

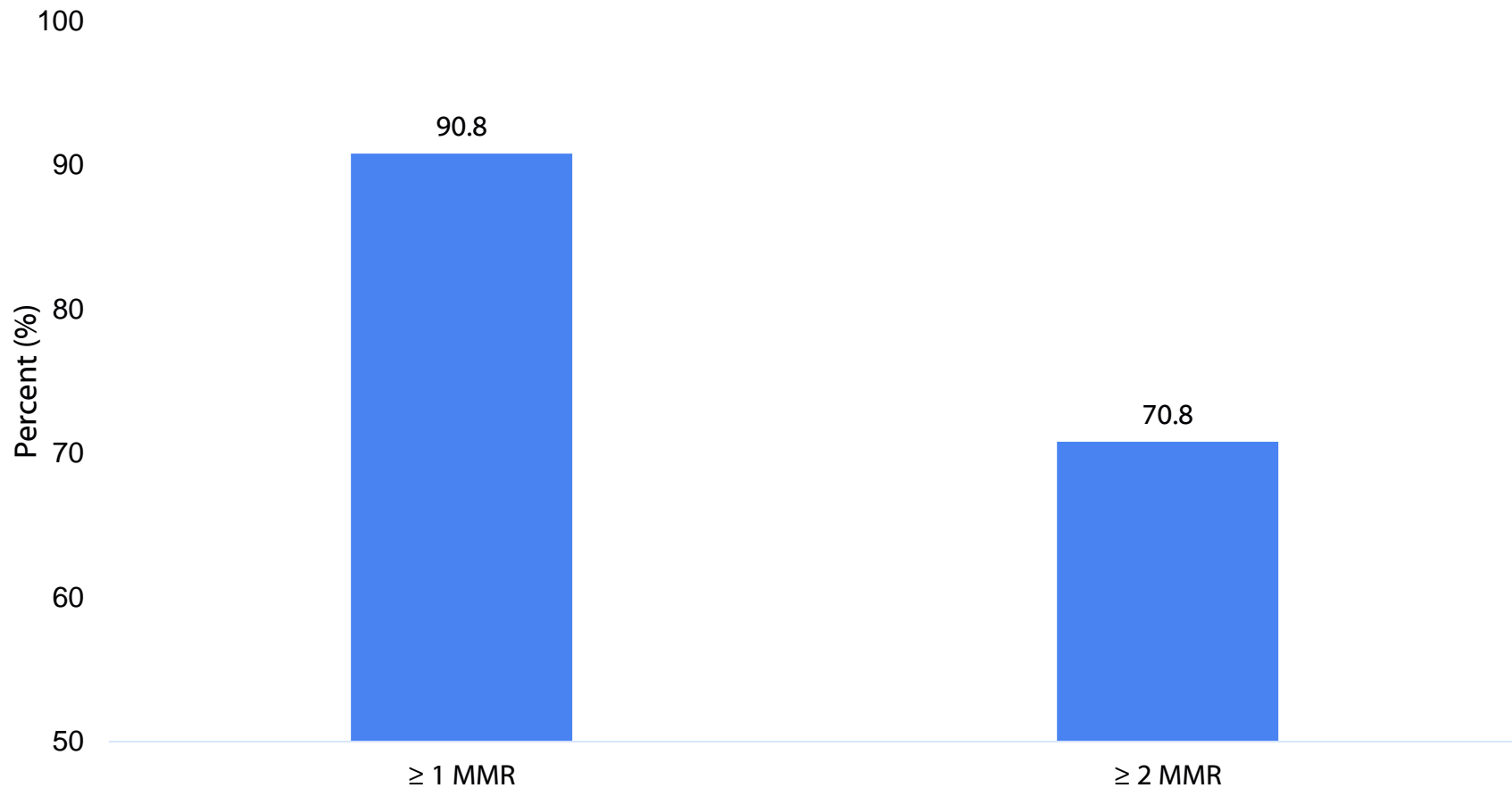
## Example: Percent of patient records that were up-to-date for the 4:3:1:3:3:4\* series according to IIS, not up-to-date according to medical records



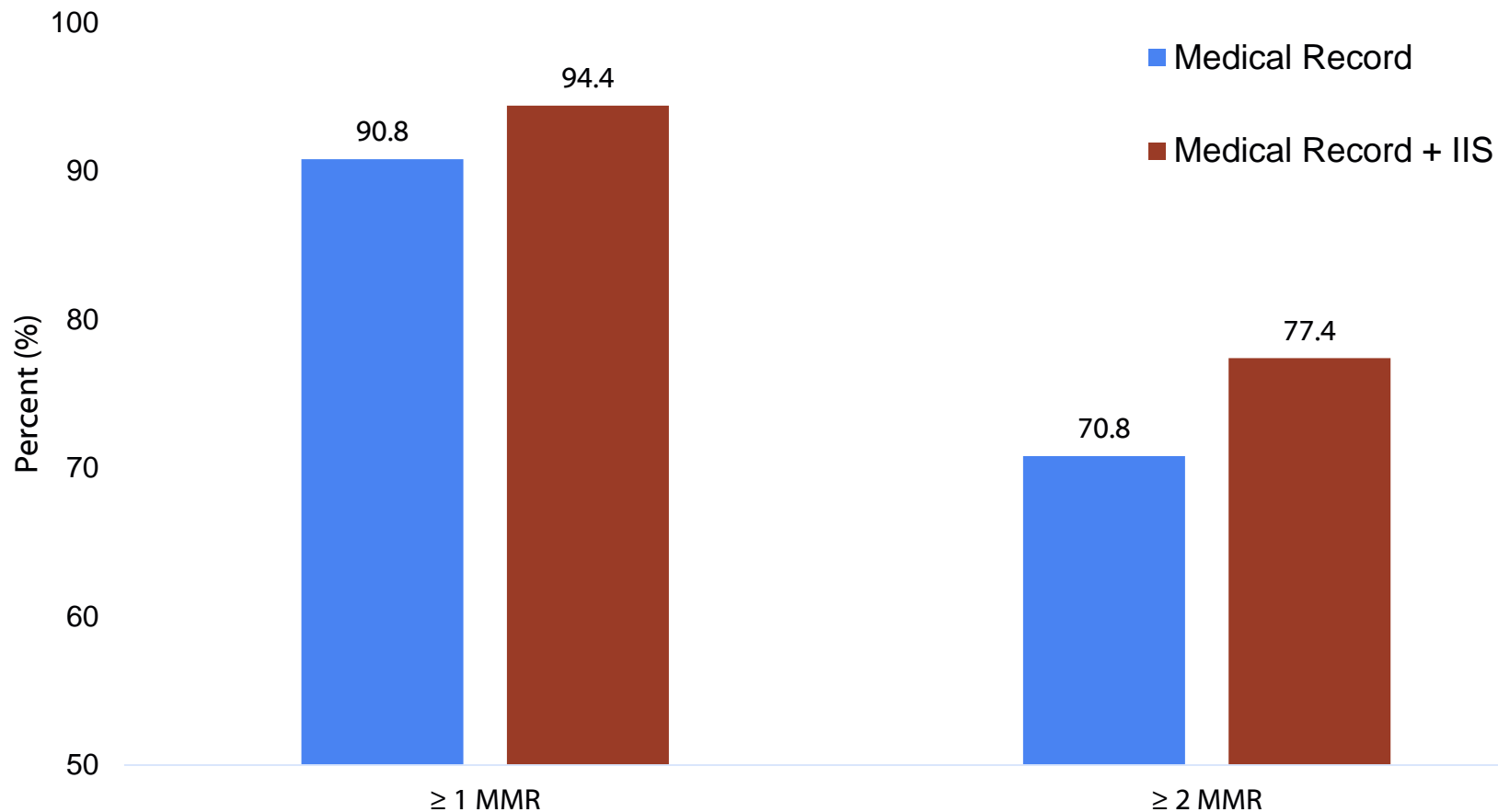
\* $\geq 4$  DTaP,  $\geq 3$  IPV,  $\geq 2$  MMR,  $\geq 3$  Hib,  $\geq 3$  HepB, and  $\geq 4$  PCV



## Example: MMR coverage according to only medical records



## Example: MMR coverage including supplemental IIS data



# IIS Use in Low Resource Settings

Outbreak Response



# Outbreak background

## ■ RMI 2016-2017

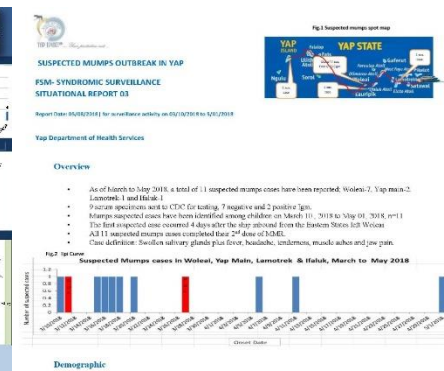
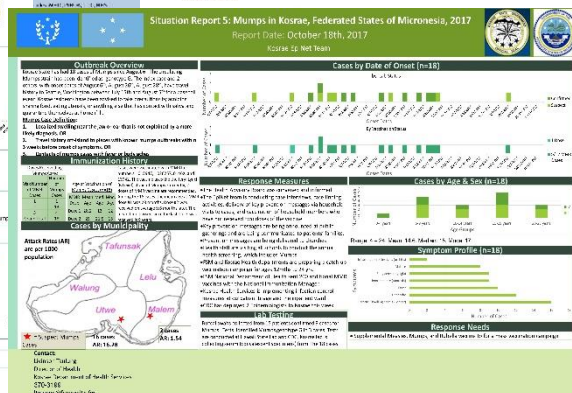
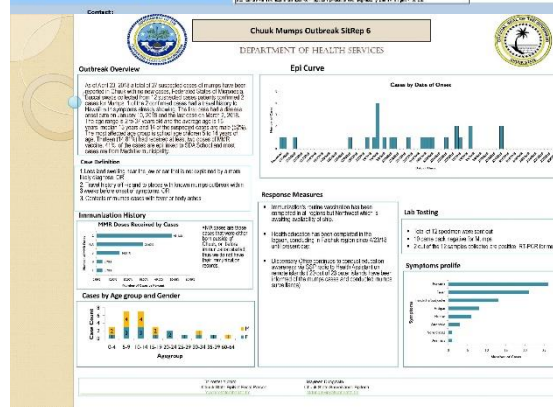
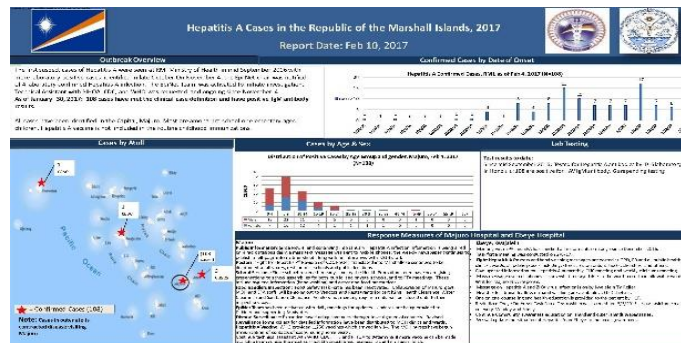
### — Hepatitis A

### — Mumps

## ■ FSM 2017-2018

### — Mumps

### — Rotavirus



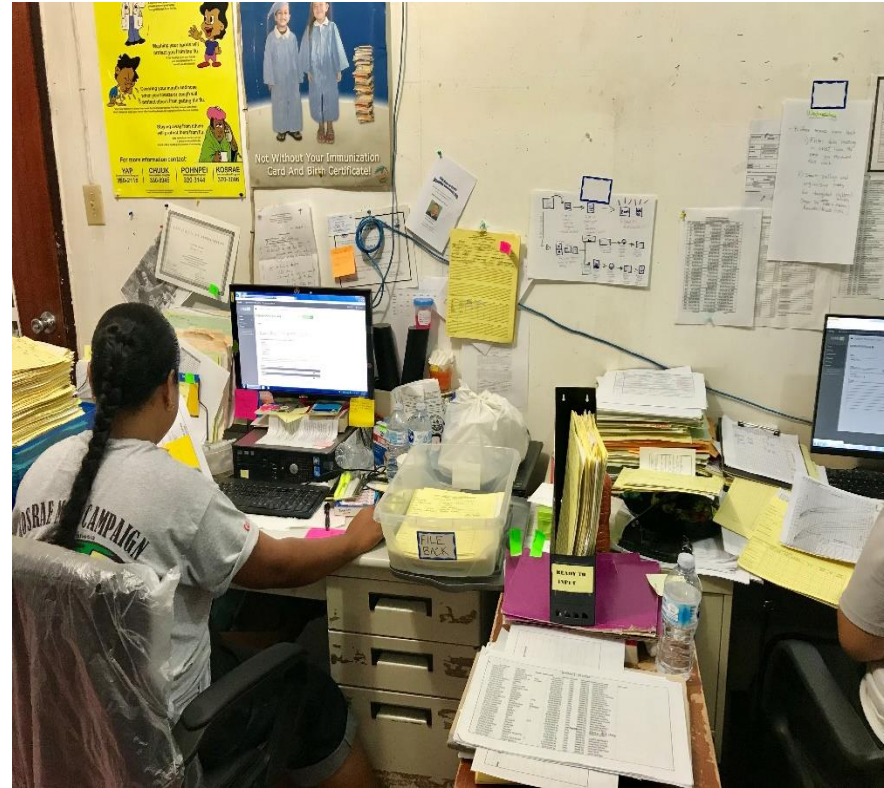
# Outbreak response measures

- Awareness campaigns on preventative measures
  - Radio
  - Announcements in churches and community events
  - Newspaper and flyer announcements
- Active surveillance
- Case investigation
- Specimen collection
- Contact tracing
- Vaccination campaigns



# Benefits of IIS during outbreak response

- Rapid attainment of vaccination histories
  - Cases
  - Contacts
- Identify settings (e.g. villages, schools) with low coverage
- Identify individuals to target for vaccination



# Impact of utilizing IIS during outbreak response

- Vaccination histories included in weekly situation report
  - Provided valuable information for decision-makers
- Reminder and recall report generated from IIS used during vaccination campaign
  - Save time and resources by targeting individuals
- Real time monitoring of changes in vaccination coverage



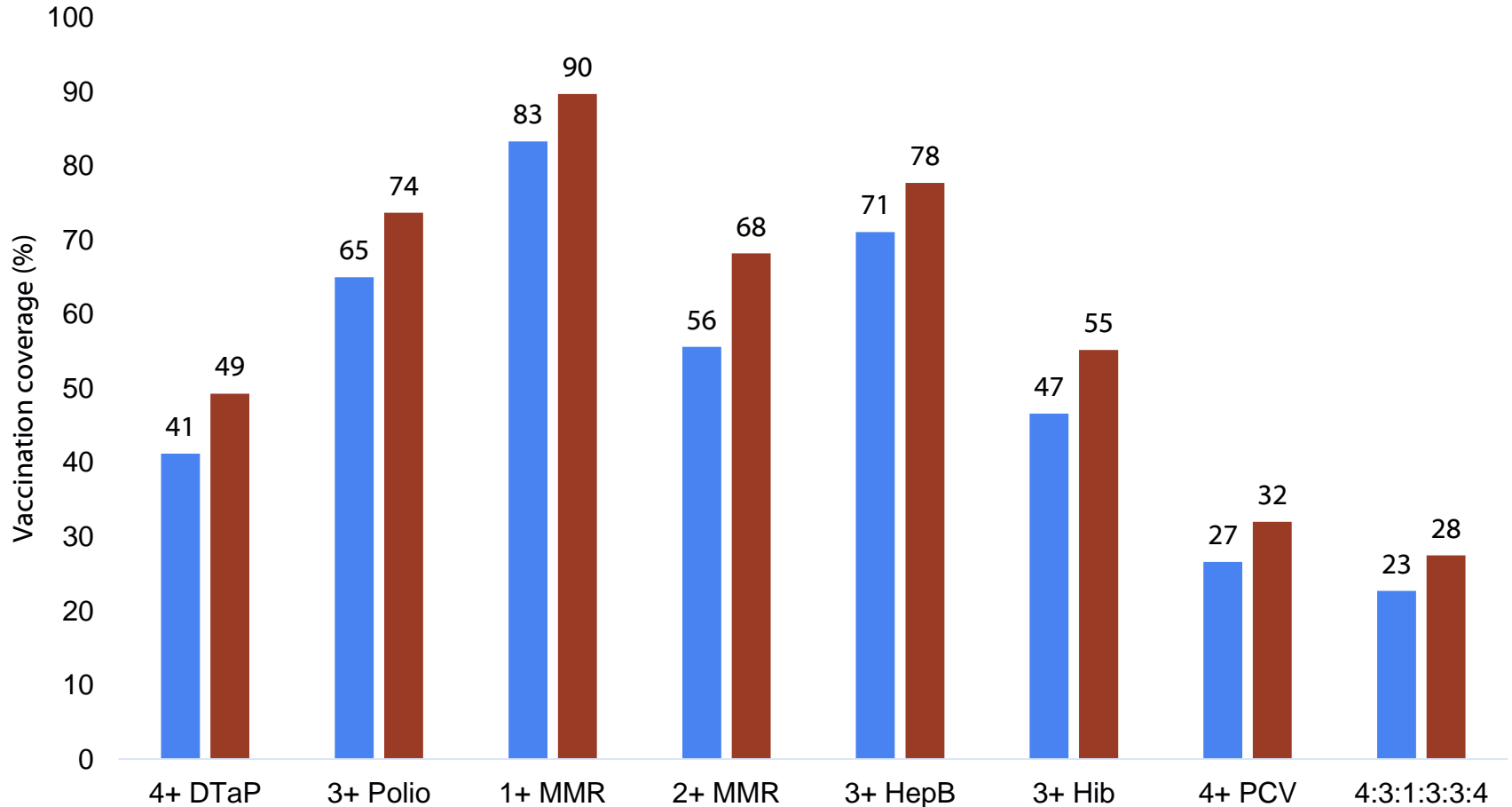
# IIS Use in Low Resource Settings

Project Evaluation

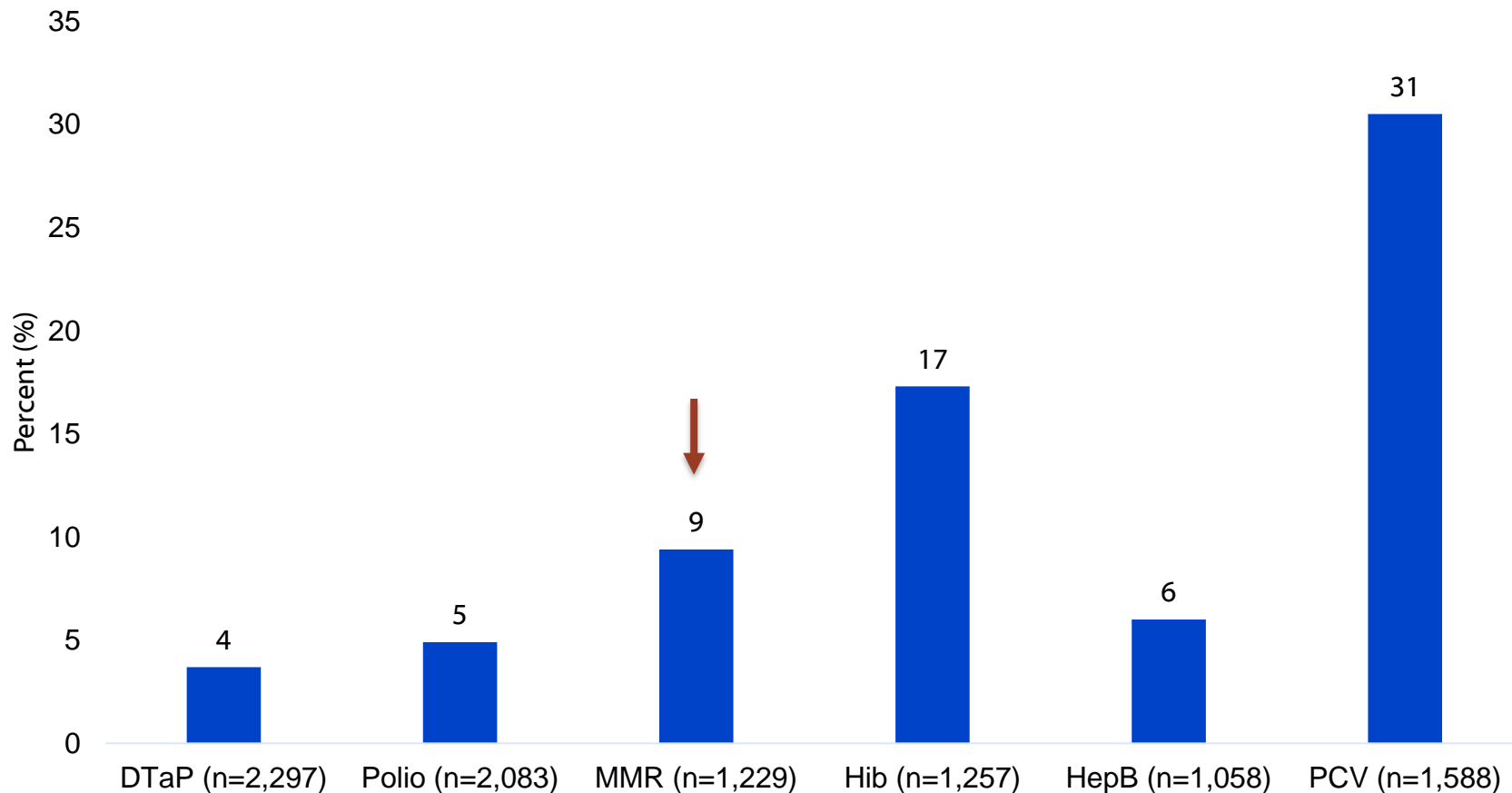
# Evaluation Background

- In response to outbreaks, catch-up campaigns conducted in FSM
- FSM Immunization Program partnered with CDC to develop an evaluation
  - Implementation strategies
  - Vaccination coverage
  - Data quality improvement
- IIS used as the primary data source

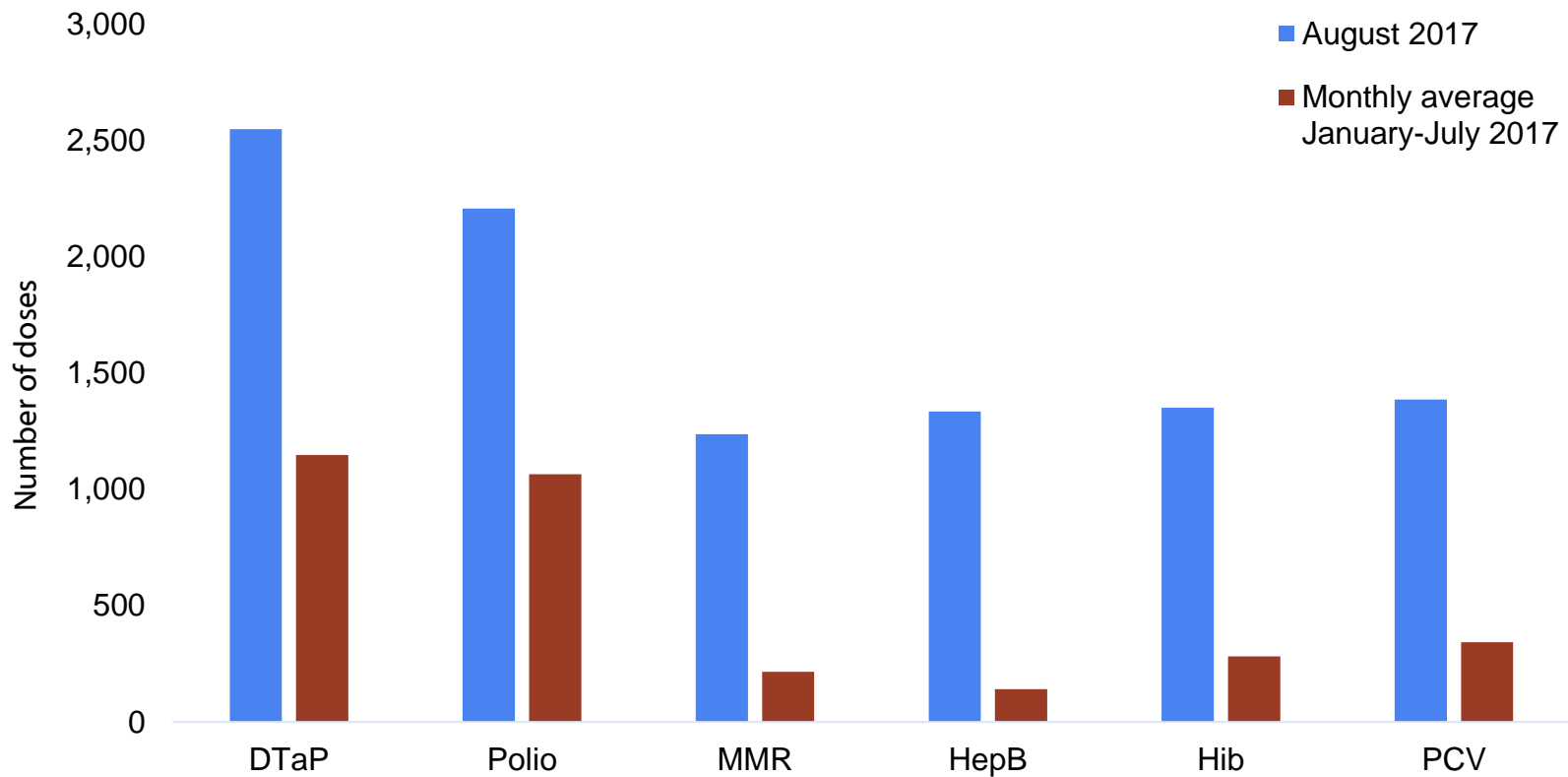
## Example: Change in coverage, children 19-35 months



## Example: Missed vaccination opportunities



## Example: Number of doses administered during a vaccination catch-up campaign, compared to the monthly average



# Impact of using IIS for project evaluation

- Rapid assessment
- Recommendations for improvement for next campaign
  - Rapid results dissemination enabled program to implement recommendations before start of next campaign
    - E.g. data quality check of IIS prior to campaign kick-off in Pohnpei, FSM

# Summary

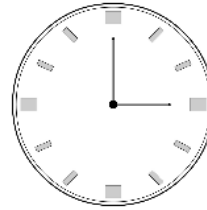
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# Strengths

- Rapid
  - Timely results for decision-making
  - Cost-saving
- Identify pockets of need
  - Routine surveillance
  - Outbreak response



# Limitations

- Completeness for older populations
- Limited resources
  - Timeliness of data entry
  - Training capacity
- Internet and power reliability

# Summary

- IIS is an effective solution to:
  - Monitor population-level vaccination coverage
  - Respond to VPD outbreaks
  - Evaluate program interventions
- USAPI immunization programs are leveraging IIS to:
  - Improve vaccination outcomes among vulnerable populations
  - Increase vaccination coverage
  - Decrease the risk of VPD outbreaks

# Acknowledgements

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- FSM
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- CNMI
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  - Vai Fuata

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  - Peter Judicpa
  - Nathan Crawford
- IISSB
  - Beth Cox



# Thank you!

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

