Data Quality

Improving the Quality of Data in your IIS

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Learning Objectives

- Develop an understanding of core data quality concepts and themes

- Apply foundational documents in considering aspects of your system's data quality (e.g., CDC Blueprint and Dashboard, AIRA Measurement and Improvement Content Areas, etc.)

- Understand and be able to identify multiple points of intervention for improving your system's data quality

Overview of Data Quality (DQ)

Introduction

- Review and Discuss Your Data Quality Assessment (pre-work)

Deeper Discussion of Key DQ Tools and Resources

- CDC DQ Blueprint/Dashboard, Measurement and Improvement Reports on DQ, Guidance Resources

<u>Activity</u>: Where to Intervene to Improve Data Quality?
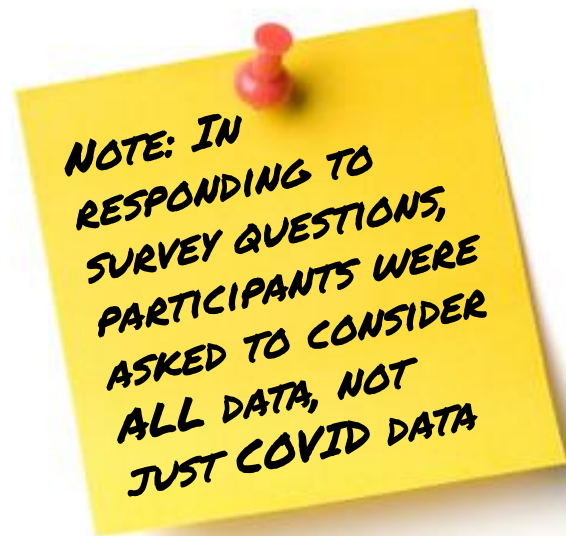
Introduction to DQ

Review of your DQ assessments

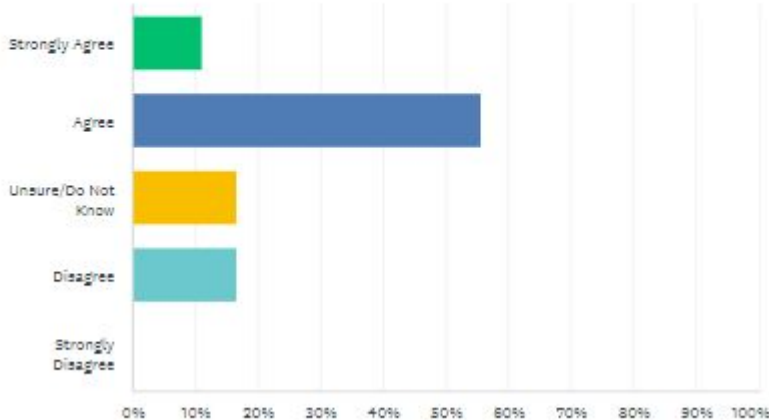# Reviewing All Participants' Data Quality Assessments

- Where does the community overall appear to be strongest?

- Where do the most significant challenges seem to exist?

- Any surprises?

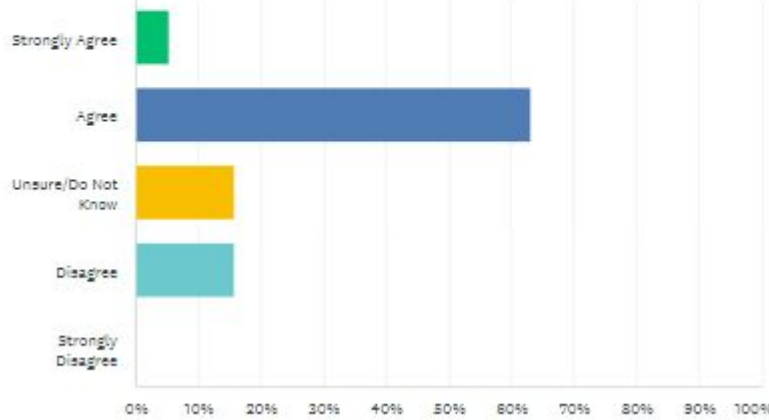- Do you see your IIS as an outlier with any questions?

NOTE: IN RESPONDING TO SURVEY QUESTIONS, PARTICIPANTS WERE ASKED TO CONSIDER ALL DATA, NOT JUST COVID DATA

Data Quality Survey Responses

Our IIS program has a comprehensive plan or protocol for monitoring IIS incoming data quality.

Answered: 18   Skipped: 1

Strongly Agree	
Agree	
Unsure/Do Not Know	
Disagree	
Strongly Disagree	

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Our IIS program has a comprehensive plan or protocol for assessing data within my system (data at rest).

Answered: 19   Skipped: 0

Strongly Agree	
Agree	
Unsure/Do Not Know	
Disagree	
Strongly Disagree	

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
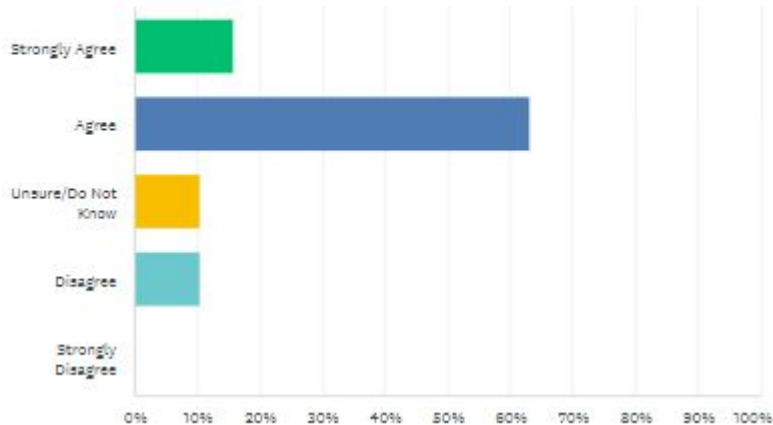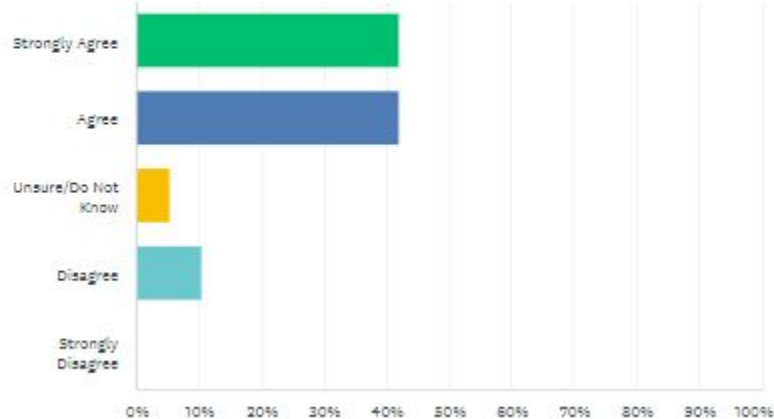
6

Data Quality Survey Responses

Our IIS program has clear and documented procedures for onboarding new providers.

Answered: 19   Skipped: 0

I can query our IIS and determine how many vaccines each provider administers and reports.
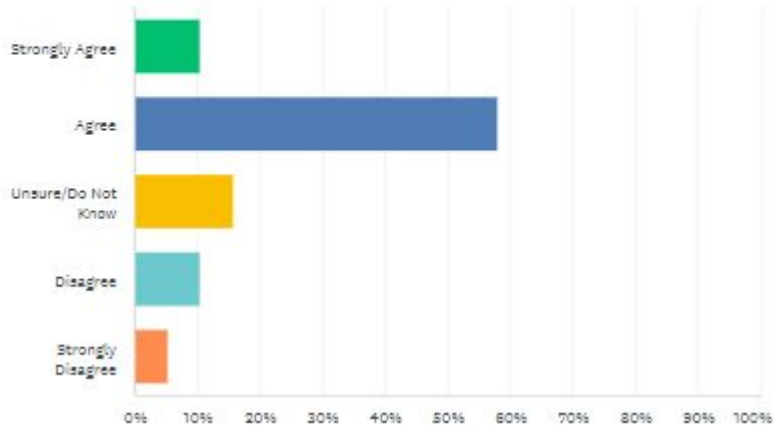
Answered: 19   Skipped: 0
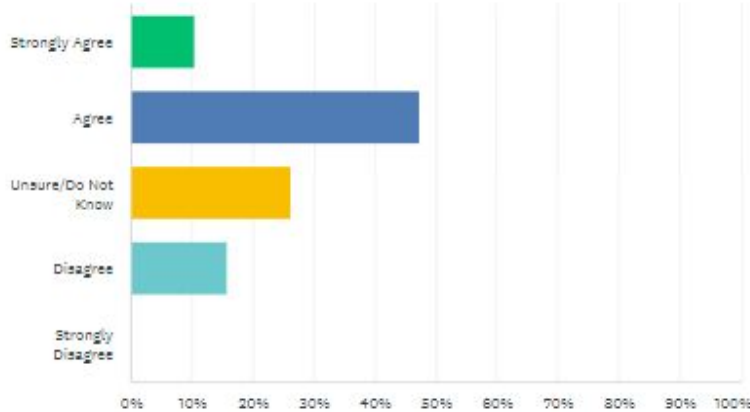
7

Data Quality Survey Responses

My team has a viable method for assessing the percentage of potential duplicate patient records in the IIS.

Answered: 19   Skipped: 0

My team has a viable method for assessing the percentage of potential duplicate immunizations in the IIS.
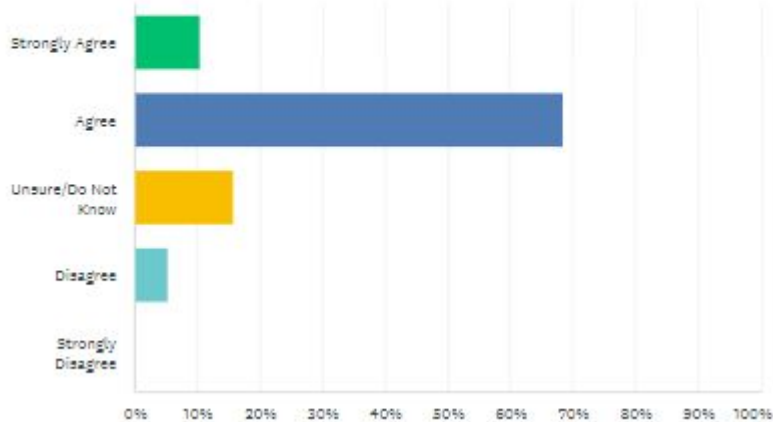
Answered: 19   Skipped: 0

8

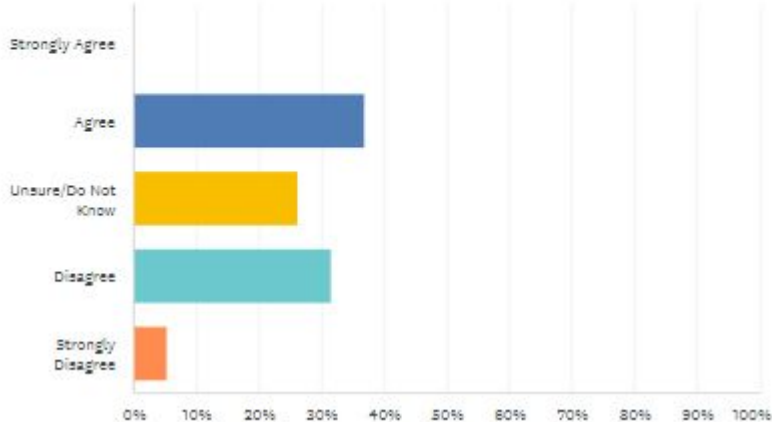# Data Quality Survey Responses

My team can explain to providers what steps our program takes to ensure data quality.

Answered: 19   Skipped: 0

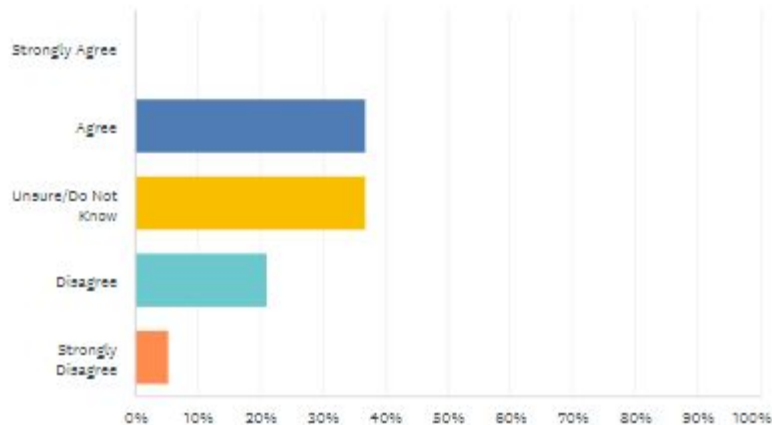Our system provides helpful routine data quality reports to providers.

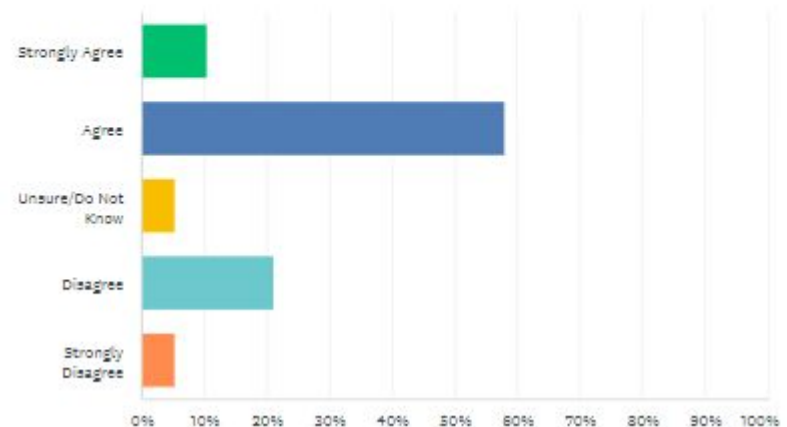Answered: 19   Skipped: 0

Data Quality Survey Responses

Our providers regularly review acknowledgement messages and data quality reports, and fix data quality errors in the IIS in a timely manner.

Answered: 19   Skipped: 0

Our program and/or technology partners can add a new vaccine and forecast to the IIS in a timely and accurate way.

Answered: 19   Skipped: 0

Data Quality Survey Responses

I am/my team is familiar with the MIROW business rules and guidance documents related to data quality.

Answered: 19   Skipped: 0
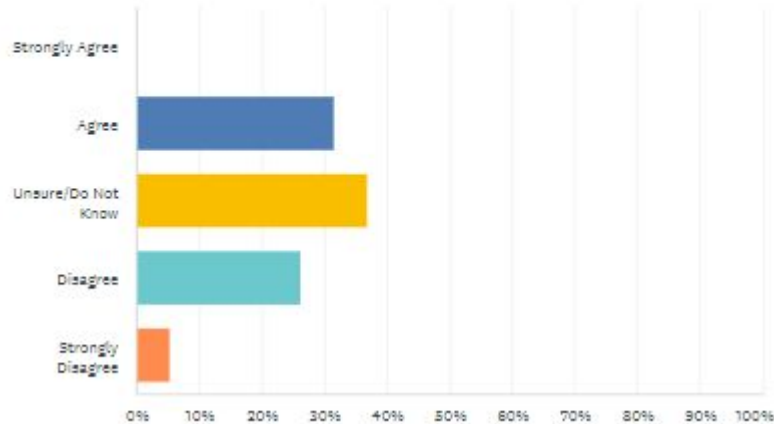
Our IIS program has implemented most of the documented data quality business rules and best practices noted in MIROW chapters and data quality guidance documents.

Answered: 19   Skipped: 0
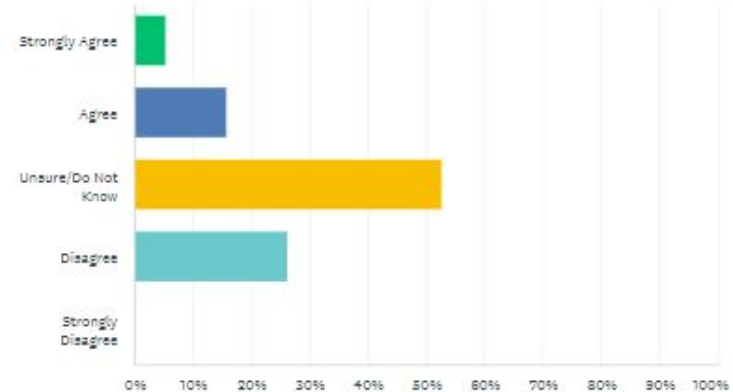
Data Quality Survey Responses

I have/my team has enough staff to adequately address
data quality within my IIS.

Answered: 19   Skipped: 0

IIS
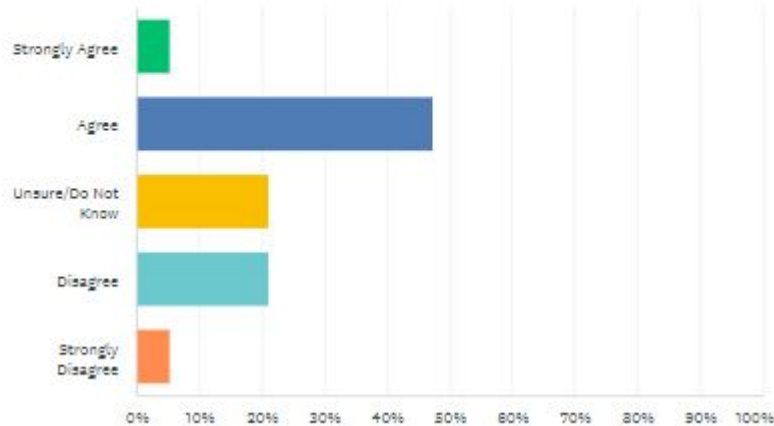
Data Quality Survey Responses

Have you or your team reviewed the AIRA AART report on incoming/ongoing data in the last year?

Answered: 19   Skipped: 0
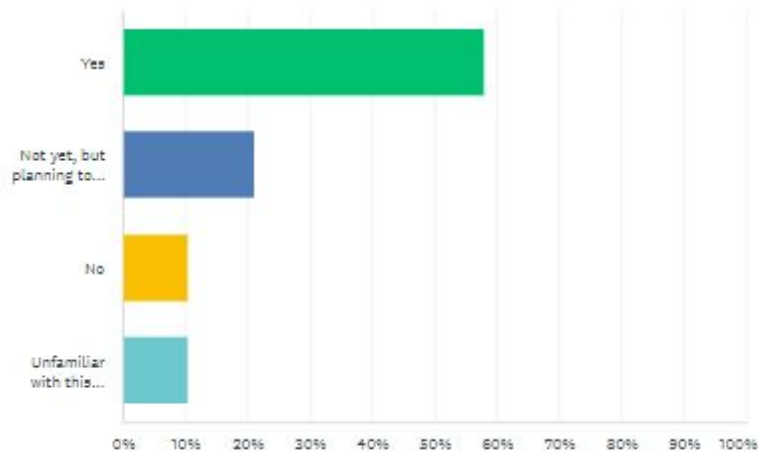
Have you or your team reviewed the AIRA AART report on data at rest in the last year?

Answered: 19   Skipped: 0
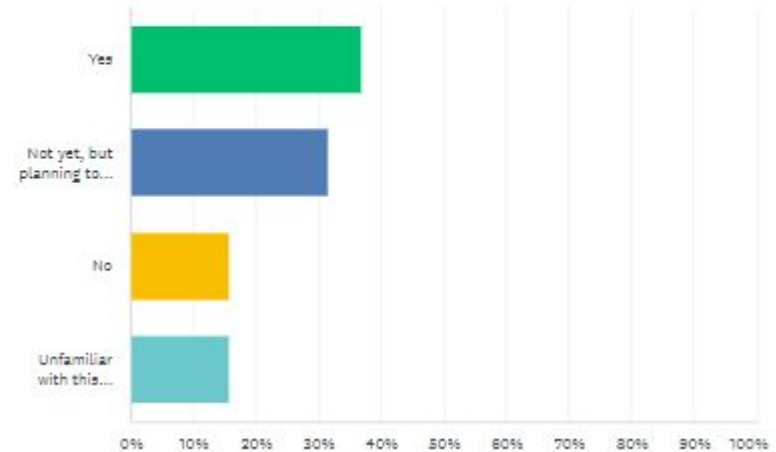
Data Quality Survey Responses

Have you or your team reviewed CDC's data quality reports in the last year?

Answered: 19   Skipped: 0
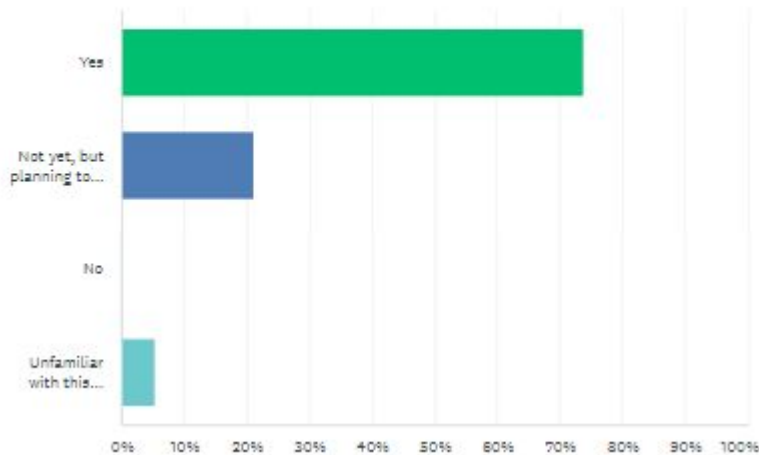
Have you or your team reviewed your program's CDC dashboard in the last year?

Answered: 19   Skipped: 0

14
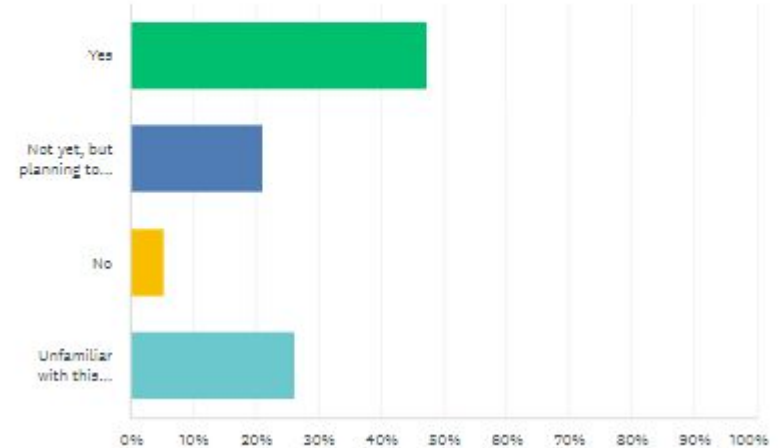
Relationship Between Data Use and Data Quality

End users gather and enter accurate, complete and timely data.

Data are messaged, processed and/or queried successfully.

IIS and partners (EHR, HIE, etc.) invest in data quality assurance/ improvement.

Quality data support frequent and broad data use by stakeholders.

Data are turned into information to improve coverage rates and overall health.
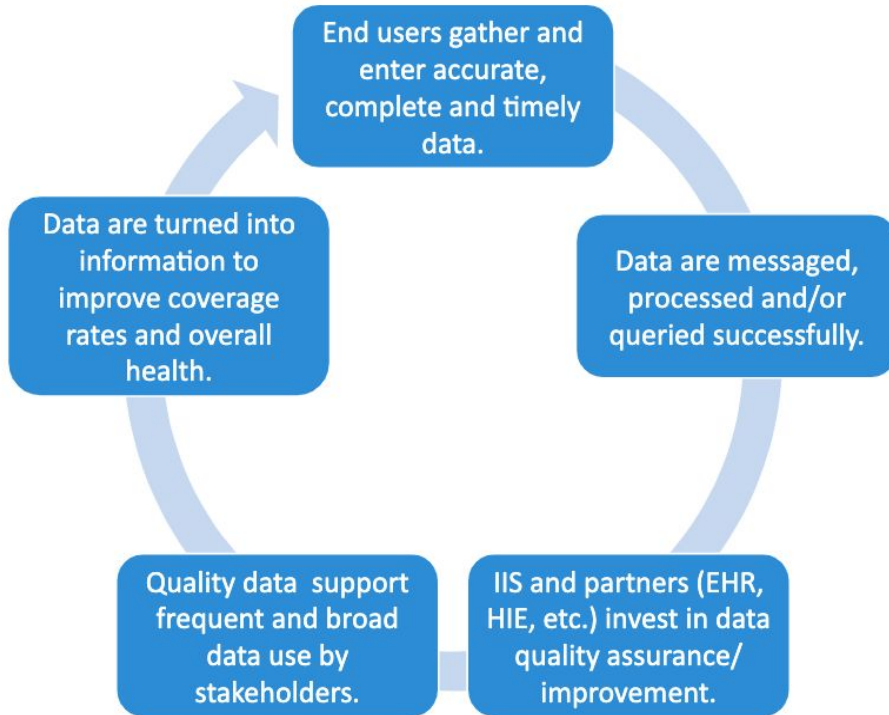
- The more stakeholders use the data, the more they will invest in the data quality

- We should make it **easy** for authorized users to get data in and out of our systems

DQ Trade-Offs: Consider an IIS with Extremely Rigid Data Quality Requirements for Incoming Data
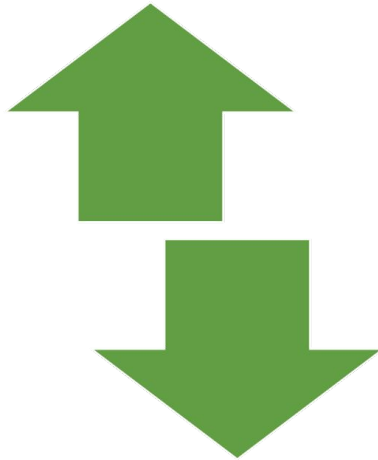
Accuracy of data in the IIS may go up

Completeness of data would likely go down

IIS Leader's Role in Data Quality

➡ Ensure resources are devoted to assessing and improving data quality

➡ Set the direction for data quality efforts through planning and prioritization

➡ Strategically communicate about data quality internally and externally

Key Data Quality Tools

Information and Resources for Your Use

What Guides IIS Community-Wide DQ Activities?

BLUEPRINT ENDPOINT
IISs have trusted data to:
1. Assess national, state, and local immunization coverage
2. Identify vulnerable populations and pockets of need
3. Support responses to emerging needs

AVAILABLE — Immunization program staff have the ability to query IIS data for coverage reports and answering ad-hoc questions

COMPLETE — 90% of all provider sites in the jurisdiction are reporting to the IIS; 90% of demographic records for the jurisdiction are included in the IIS; 90% of vaccination records for persons in the jurisdiction are included in the IIS

TIMELY — 95% of birth records are created in the IIS within 30 days of the patient's birth; 95% of vaccination events are recorded in the IIS within 1 day

VALID — 100% of patient addresses are validated using external sources; 100% of routine age-based vaccines in the IIS are evaluated and forecasted in alignment with ACIP recommendations

19

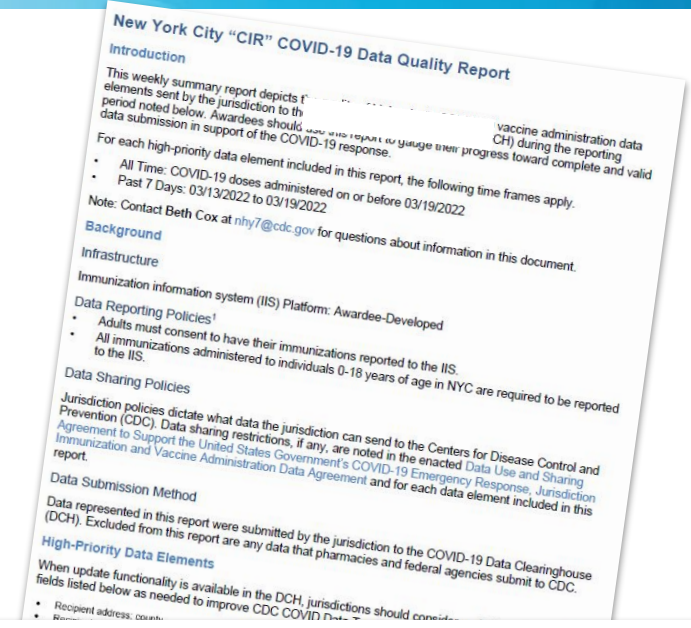# CDC Reports

Past COVID-19 Data Quality Reports

- Race/Ethnicity
- County
- CVX Code

CDC Dashboard

Routine Imms Analysis

- Quarterly reports
  - *To be developed*

New York City "CIR" COVID-19 Data Quality Report

Introduction

This weekly summary report depicts ... elements sent by the jurisdiction to th... vaccine administration data period noted below. Awardees should use this report to gauge their progress toward complete and valid data submission in support of the COVID-19 response.

For each high-priority data element included in this report, the following time frames apply.

- All Time: COVID-19 doses administered on or before 03/19/2022
- Past 7 Days: 03/13/2022 to 03/19/2022

Note: Contact Beth Cox at nhy7@cdc.gov for questions about information in this document.

Background

Infrastructure

Immunization information system (IIS) Platform: Awardee-Developed

Data Reporting Policies[1]
- Adults must consent to have their immunizations reported to the IIS.
- All immunizations administered to individuals 0-18 years of age in NYC are required to be reported to the IIS.

Data Sharing Policies

Jurisdiction policies dictate what data the jurisdiction can send to the Centers for Disease Control and Prevention (CDC). Data sharing restrictions, if any, are noted in the enacted Data Use and Sharing Agreement to Support the United States Government's COVID-19 Emergency Response, Jurisdiction Immunization and Vaccine Administration Data Agreement and for each data element included in this report.

Data Submission Method

Data represented in this report were submitted by the jurisdiction to the COVID-19 Data Clearinghouse (DCH). Excluded from this report are any data that pharmacies and federal agencies submit to CDC.

High-Priority Data Elements

When update functionality is available in the DCH, jurisdictions should consider... fields listed below as needed to improve CDC COVID Data ...
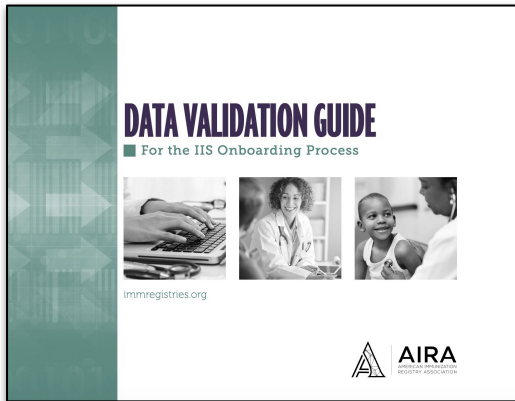
- Recipient address, county

Available

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Blueprint Milestone: Immunization program staff have the ability to query IIS data for coverage reports and answering ad hoc questions

Indicator	Year: 2018	Year: 2019	Year: 2020	2020 Target Achieved	Target	% Awardees Meeting Target in 2020
In the last calendar year, the IIS was used to generate provider-level coverage assessments that met current published CDC operational and technical guidelines for provider-level quality improvement. {18.1.1}	No Data	Yes	Yes	★	Yes	93.8%
In the last calendar year, IIS staff produced IIS-generated provider-level coverage assessments based on user-selected criteria. {18.1.2}	No Data	Yes	Yes	★	Yes	87.5%
In the last calendar year, non-IIS immunization program staff produced IIS generated provider level coverage assessments based on user-selected criteria. {18.1.3}	No Data	Yes	Yes	★	Yes	82.8%
In the last calendar year, providers were able to produce IIS-generated coverage assessments based on user-selected criteria. {18.1.4}	No Data	Yes	Yes	★	Yes	84.4%

Guidance for Program Practices

1. Onboarding data testing prior to go-live
2. Incoming/ongoing data via monitoring
3. Data at rest via evaluation/assessment

DATA VALIDATION GUIDE
For the IIS Onboarding Process
immregistries.org
AIRA — AMERICAN IMMUNIZATION REGISTRY ASSOCIATION

IIS DATA QUALITY PRACTICES
Monitoring and Evaluating Data Submissions
immregistries.org
AIRA — AMERICAN IMMUNIZATION REGISTRY ASSOCIATION
Immunization Information Systems for a New Era

IIS DATA QUALITY PRACTICES
TO MONITOR AND EVALUATE DATA AT REST
5.11.2018
AIRA — AMERICAN IMMUNIZATION REGISTRY ASSOCIATION

https://repository.immregistries.org/resources

Onboarding Guide

Document released and published on AIRA Repository – January 2019

http://repository.immregistries.org/resource/onboarding-consensus-based-recommendations/

ONBOARDING
CONSENSUS-BASED
RECOMMENDATIONS

NOVEMBER 2018

AIRA
AMERICAN IMMUNIZATION
REGISTRY ASSOCIATION

Onboarding Templates

1. **Readiness Checklist** - a tool used to provide an overview of activities that need to be completed by a provider in order to prepare for onboarding and data exchange

2. **Registration Form** - a tool used to capture basic information from a provider organization that wants to exchange data with your IIS

3. **Questionnaire** - a questionnaire used to capture detailed information from a provider regarding population served, immunization practice, patients, and electronic health record (EHR) system used

4. **Onboarding Guide** - a tool used to provide information about the IIS onboarding process for provider organizations to establish and test data exchange with an IIS

5. **Onboarding and Interface Project Tracking Tool** - a tool that allows IIS to monitor and track provider organizations' onboarding progress

Published August 2022

Replaces:

- Data Quality Assurance in Immunization Information Systems: Incoming Data (2008)

- Data Quality Assurance in Immunization Information Systems: Selected Aspects (2013)

- Lot Number Validation Best Practices Micro-Guide (2014)

Data Quality Main Characteristics

Availability: IIS data can be readily used by authorized users to inform IIS and immunization program activities.

Completeness: The IIS contains all (historic and new) vaccination and demographic records for persons residing in the jurisdiction, and all vaccination and demographic records contain complete data fields.

Timeliness: Patient records are established, and vaccination events are recorded in the IIS within specified time frames.

Validity: Vaccination and demographic records in the IIS conform with generally accepted standards (e.g., Advisory Committee on Immunization Practices recommendations, United States Postal Service standards).

Data Quality Enabling Characteristics

Accuracy: The IIS correctly reflects the demographic information of patients and data related to all aspects of their vaccination events.

Consistency: The IIS receives, stores, and processes data in accordance with established standards.

 Uniqueness: Each patient and their corresponding vaccinations are recorded only once in the IIS.

AART DQ Content Areas

Assessment

IIS Assessment involves more formal testing to measure individual IIS systems using IIS community-selected measures and tests.
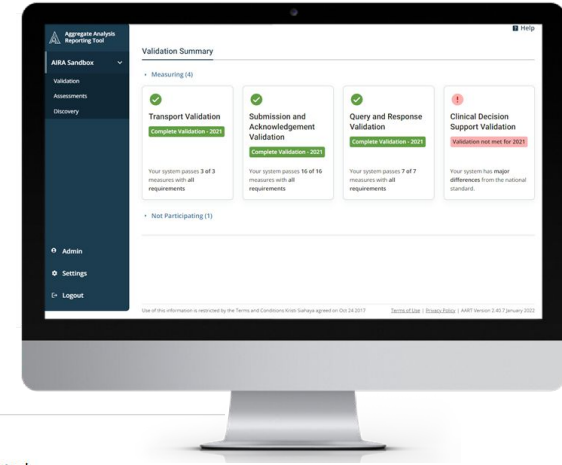
Content Area	Assessment Results	Validation Results
Transport	3 of 3	2022 ✓ Complete Validated
Submission & Acknowledgement	16 of 16	2021 ✓ Complete Validated
Query & Response	7 of 8	2021 ✓ Complete Validated
Data Quality Incoming/Ongoing	25 of 27	Report not Available
Clinical Decision Support	5 of 12	2021 ⚠ Major Difference - Validation Not Met

Data At Rest (DAR) Process

De-identified patient and vaccination data on 0 to 2-year-olds extracted from IIS database

De-identified data transformed into encrypted file of counts for each measure
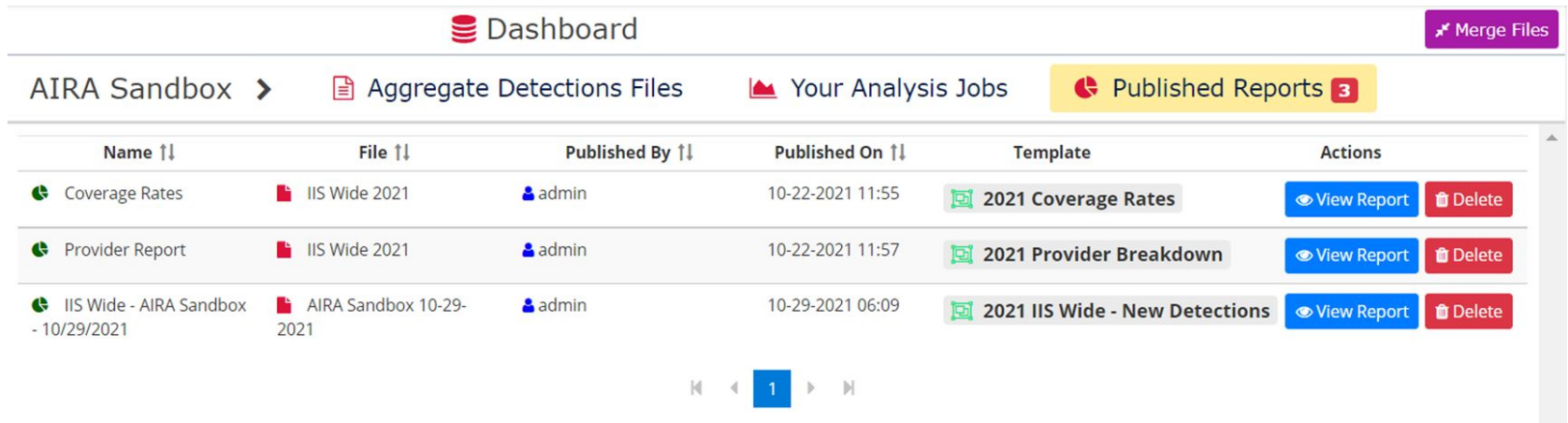
AIRA analyzes encrypted file and measures data

- Completeness

- Validity

- Timeliness

DAR Benefits

IIS wide and provider specific data quality reports, robust ad-hoc query functionality:

Visit https://www.immregistries.org/data-at-rest for more information or email aart@immregistries.org to participate
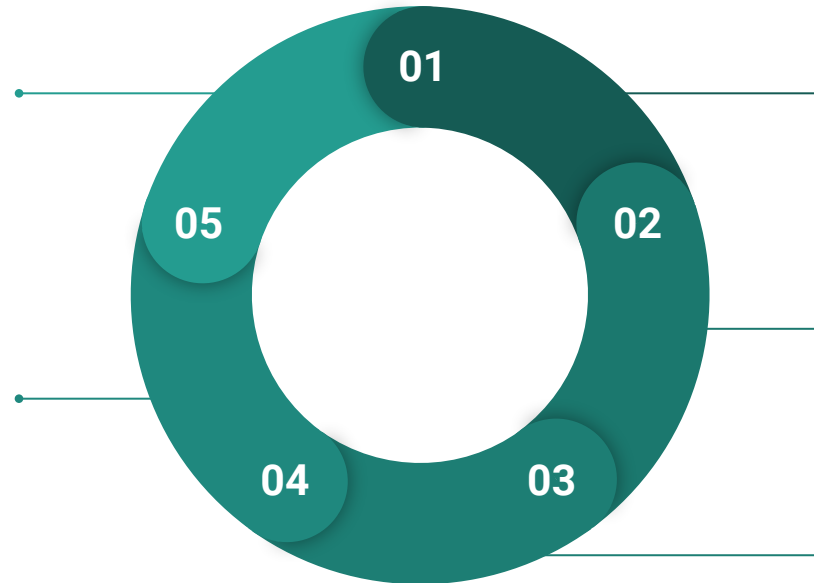
Determine Who/Where to Intervene on IIS DQ Challenges

IIS HL7 Interface
IIS may not send back properly configured acknowledgement or response messages.

IIS System or Program
IIS may have questionable deduplication algorithms that cause false positives or false negatives, or incomplete business rules.

**End User
(Provider, pharmacist, etc.)**
Workflow issues may affect accuracy or completeness of data capture.

EHR HL7 Interface
EHR system may be sending inconsistently, or may be unable to receive acknowledgement messages.

Electronic Health Record/ IT System
System may have fields configured incorrectly or code sets improperly mapped.

01
02
03
04
05

Incentivizing Provider Sites/EHRs to Invest in Data Quality

Once providers are through testing, how do we engage them?

Ideas:

- Provider site report cards/quality reports
  - Summary of IIS activity with report cards: https://repository.immregistries.org/resource/provider-organization-level-report-cards-data-quality-reports/
- Recognition for good data quality (e.g., "honor roll", partner awards)
- Leveraging associations (e.g., AAP, AAFP)
- Partnering with local chapters (e.g., HIMSS*)
- Support ONC rules that incentivize reporting (e.g., HTI-1)

What else?

*HIMSS = Health Information Management Systems Society

Provider Office EHR Data Entry Screens/Work Flow

EHR User Interface, Outgoing Message Triggers, Incoming Query Responses

HIE Business Rules/Processes

IIS HL7 Interface Standards
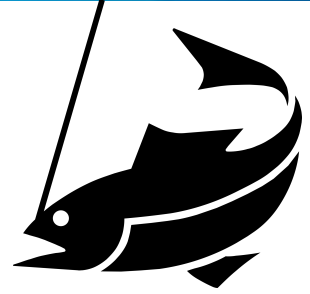
IIS Business Rules, Matching

IIS Data Quality Reports

IIS-IIS Exchange

CDC

Activity: Upstream, Downstream, Where to Fish?

- Each table will take on one data quality scenario

- Participants will answer these four questions, writing high-level notes on the flip charts:

  - What problem are we addressing (i.e., what fish are we looking for?)

  - Where is the root cause (i.e., where are the big fish)?

  - What can we do about it (i.e., how do we catch them)?

  - What resources could help us (i.e., what's the best bait)?

- When groups are finished, they will rotate to another group's responses, reviewing and adding to them with a "Yes, and…" or "But wait, what about this…" approach with the speech bubble sticky notes

Activity: Upstream, Downstream, Where to Fish?

- Share your highlights with the larger group

Summary

Data quality promotes trust in the data, and data trust facilitates data use

In improving data quality, it's important to consider the most impactful areas for intervention

IIS leaders can ensure resources and attention are directed toward improving data quality and supporting interoperability

Questions/Comments/Discussion?

Data Quality Resources

- [CDC IIS Data Quality Blueprint](#) - guide to address and advance IIS data quality characteristics

- [Data Validation Guide for the IIS Onboarding Process](#) - provides recommendations on the data validation process within onboarding

- [IIS Data Quality Practices: Monitoring and Evaluating Data Submissions](#) - focuses on the ongoing data monitoring and evaluation process for incoming data submissions

- [IIS Data Quality Practices: To Monitor and Evaluate Data at Rest](#) - provides practical guidance on techniques, methodologies, and processes for IIS to use in assessing the quality of data at rest

- [Data Quality Assurance in Immunization Information Systems](#) - provides best practice recommendations that support and sustain high-quality data in IIS

- [AIRA Aggregate Analysis Reporting Tool (AART) Tool](#) - an application developed to visualize and compile results and information on community-driven measures and tests related to IIS Functional Standards

- http://repository.immregistries.org/resource/onboarding-consensus-based-recommendations/ - guidance to promote best practices for provider onboarding to IIS