AIRA
AMERICAN IMMUNIZATION REGISTRY ASSOCIATION

Data Quality Incoming/Ongoing Assessment

Aggregate Report

2025 – Quarter 2

M&I
MEASUREMENT & IMPROVEMENT

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Introduction

Overview: The measurement process for Data Quality Incoming/Outgoing (DQI) uses the National Institute of Standards and Technology (NIST) Immunization Test Suite Validation Tool. This tool provides consistent conformance-based results for all measured IIS. In addition, the technical requirements for data quality are documented in the HL7 Version 2.5.1: Implementation Guide for Immunization Messaging, Release 1.5 and addendum. This is referred to as the National IG.

A key role of immunization information systems (IIS) is combining vaccination records from many sources to create complete and accurate histories. To do this well, IIS need data from most immunizers in their area, sent through standardized electronic channels. For over 20 years, the IIS community has used messaging standards, which have become even more important with the rise of electronic health record (EHR) integration. As data are exchanged, IIS must check for and correct errors to maintain high data quality. Guidelines for ensuring data quality are outlined in several key documents, including *Data Quality Assurance in Immunization Information Systems: Incoming Data*, *Data Quality Assurance in Immunization Information Systems: Selected Aspects*, and *IIS Data Quality Practices – Monitoring and Evaluating Data Submissions*.

Background: Data Quality Incoming/Outgoing (DQI) moved into the Measurement and Improvement (M&I) stage of Assessment in 2020. This report contains the aggregate results of the IIS assessment completed in **Quarter 2 of 2025**. IIS can access their individual measurement reports in AART.

Measures: Measurement for Assessment and Certification Workgroup (MACAW), the advisory body for M&I, approved measures and tests for DQI in February 2020. The detailed measures and tests document is located on the AIRA repository. Measures and tests are based on the IIS Functional Standards v5.0. DQI measures and tests are specifically based off the following:

- **Functional Standard B4.0**: The IIS validates patient demographic and vaccination data.
- **Guidance Statement B4.1**: The IIS supports the identification, prevention, and resolution of duplicate and fragmented patient demographic and vaccination data in accordance with policies and procedures.
- **Guidance Statement B4.2**: The IIS monitors data quality within the IIS in accordance with policies and procedures.

- **Guidance Statement B4.4**: The IIS delivers feedback and training to IIS partners and providers to ensure complete, timely, and accurate patient demographic and vaccination records.
- **Guidance Statement B4.5**: The IIS meets federal and jurisdictional data quality metrics.

Testing Method: For DQI testing, AIRA will submit an HL7 message (VXU) that reflects the condition described in the test case. Each test case will be isolated to one data quality error. Following the VXU, a query (QBP) will be sent for the patient. The information returned by the IIS in both acknowledgment (ACK) and response (RSP) will be used to determine if the IIS has met the expectation of the test case. The expectations for the ACK and/or the RSP vary by test case and are fully defined in the Data Quality: Incoming/Ongoing assessment measures and tests document.

Possible Results: IIS can achieve one of three possible results in both test and measure outcomes – **meets, does not meet,** or **not measured**.

Summary Results

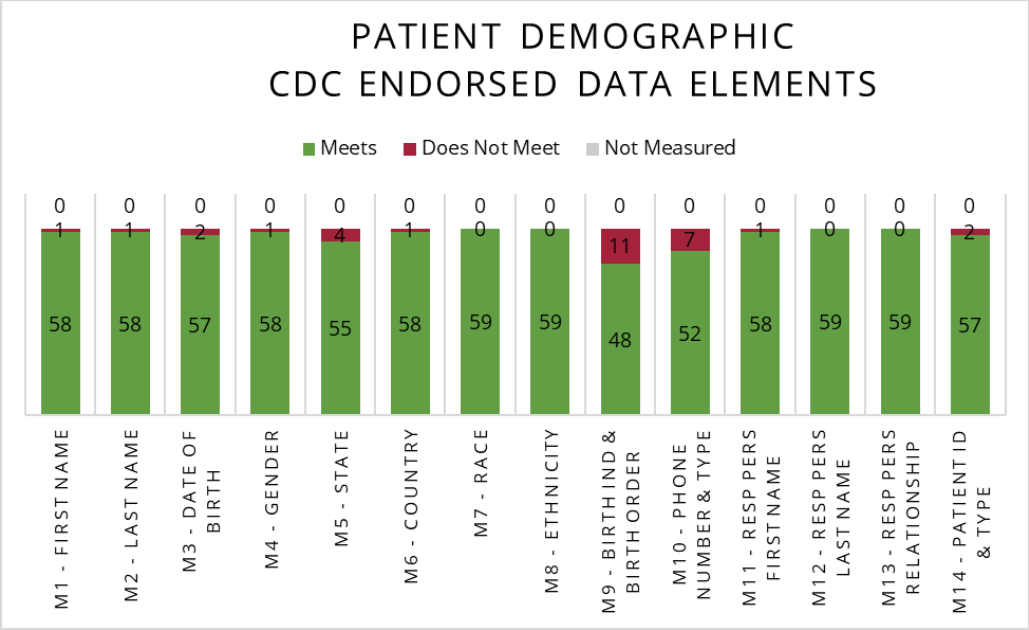
Sixty-one[1] IIS were encouraged to be measured in the IIS Assessment. Of the 61 participating IIS,[2] **59 (97%)** could be measured and are included in this report.

Patient Demographic Results

Measures 1–14 focus on CDC-endorsed data elements related to patient demographics. The tests intentionally submit missing, invalid, or conflicting data to the IIS. The IIS is expected to identify the data-quality issue via the ACK message and/or not propagate the data-quality error in the RSP.

[1] The denominator for M&I participation decreased from 62 to 61 in Q2 2022 due to San Diego IIS's merge with California's state registry.

[2] Includes all 50 states, American Samoa, the Commonwealth of the Northern Mariana Islands, the District of Columbia, the Federated States of Micronesia, Guam, New York City, Philadelphia, Puerto Rico, the Republic of the Marshall Islands, the Republic of Palau, and the Virgin Islands.

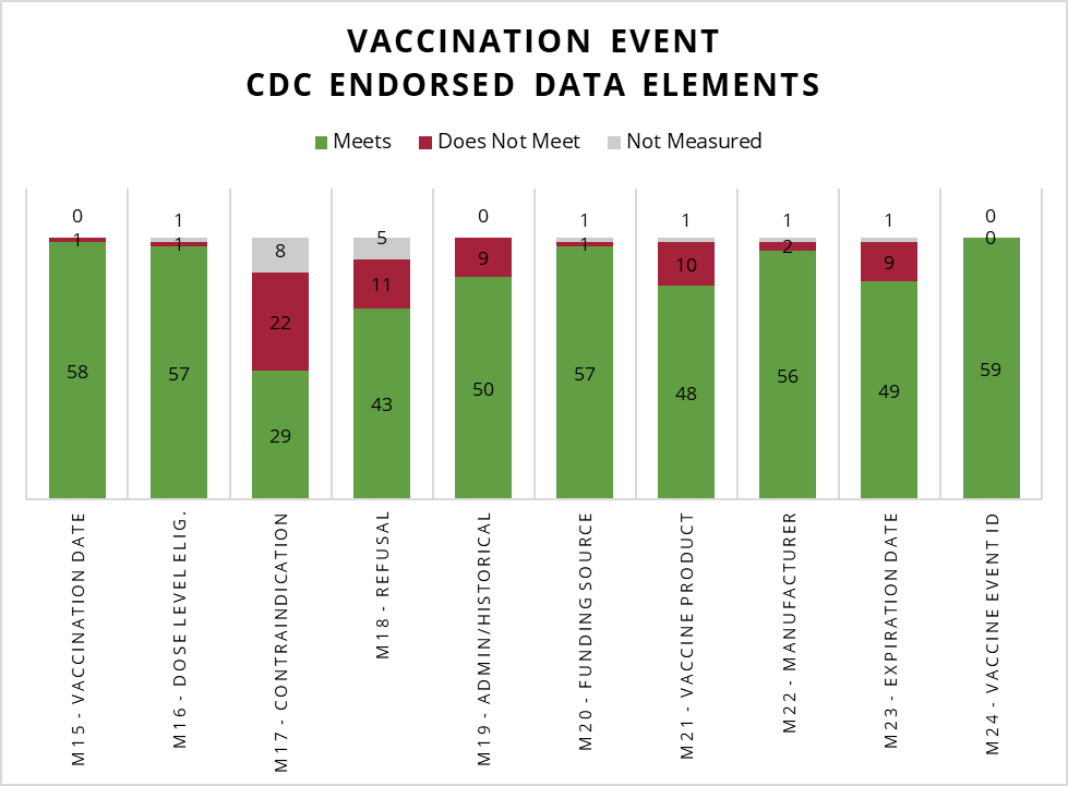


* M1, M2, M3, etc. denote the measure number reflected in the Data Quality: Incoming/Ongoing Measures section above.

There were no patient demographic data results where less than 80% failed to meet the measure.

Vaccination Event Results

Measures 15–24 focus on CDC-endorsed data elements related to vaccination events. The tests intentionally submit missing, invalid, or conflicting data to the IIS. The IIS is expected to identify the data-quality issue via the ACK message and/or not propagate the data-quality error in the RSP.



* M15, M16, M17, etc. denote the measure number reflected in the Data Quality: Incoming/Ongoing Measures section above.

The following high-level observations related to the vaccination event data elements where less than 80% met the measure provide additional context for reading and interpreting the aggregate results graph:

- **Contraindication:** Most IIS did not properly communicate missing or invalid values.
- **Refusal:** Most IIS did not properly communicate missing or invalid values.

Additional Aspects

In contrast to Measures 1–24, Measures 25–27 focus on additional aspects of data quality to ensure data submitted are represented when returned.

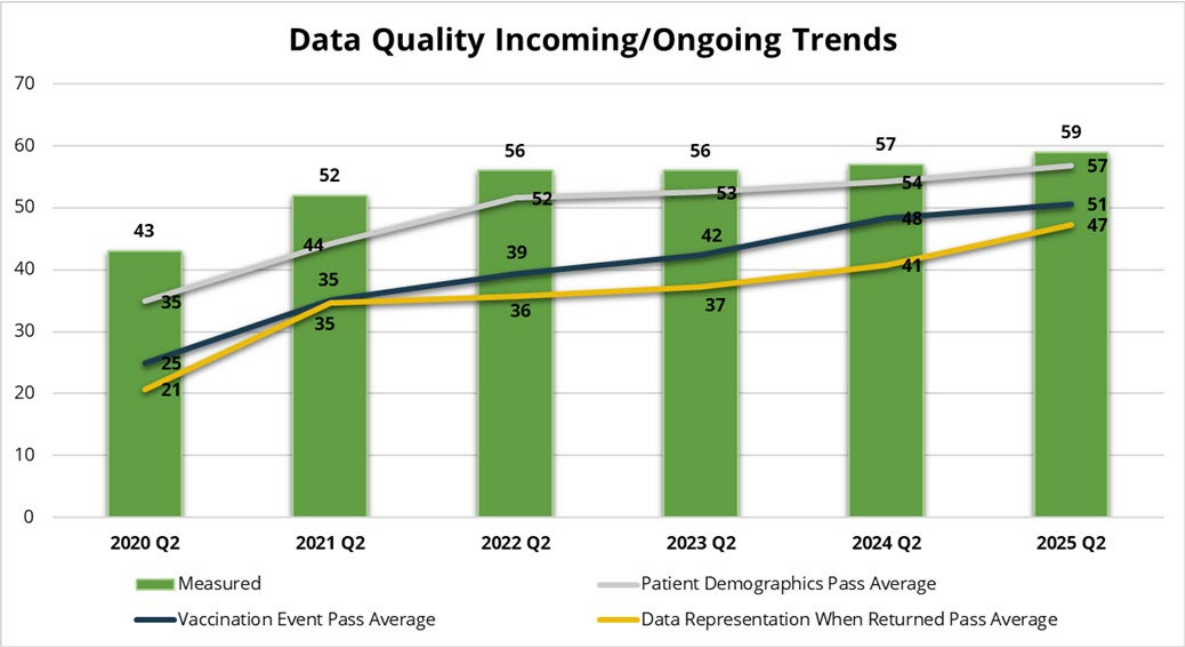
* M25, M26, M27 denote the measure number reflected in the Data Quality: Incoming/Ongoing Measures section above.

The following high-level observation related to the additional aspects where less than 80% met the measure provide additional context for reading and interpreting the aggregate results graph:

- **Returns key information:** IIS failed to return either expiration date, partial dose information, or both.

Summary of Progress

This remeasurement demonstrated progress in the following areas:



- **Reduction in "does not meet" outcomes:** The percent of measures with a "does not meet" outcome across all IIS and all measures is currently at 9%. This is a decrease from the 31% established at the initial baseline. Over the same period, we have seen an increase in the number of IIS participating in this measurement content area.
- **Measure improvement:** Accounting for the increase in participating IIS, the following 26 measures have seen improvement since the initial baseline:
    - Patient First Name
    - Patient Last Name
    - Patient DOB
    - Patient Gender
    - Patient Address: State
    - Patient Address: Country
    - Race
    - Ethnicity
    - Patient Multiple Birth Indicator & Birth Order
    - Patient Telephone Number & Telephone Number Type
    - Responsible Person First Name
    - Responsible Person Last Name

- Responsible Person Relationship to Patient
- Patient ID and Patient ID Type
- Vaccination Administration Date
- Dose Level Eligibility
- Contraindications/Precautions & Contraindication/Precaution Observation Date
- Exemptions/Refusals Reasons & Exemptions/Refusals Date
- Vaccine Funding Source
- Vaccine Product
- Vaccine Manufacturer Name
- Vaccine Expiration Date
- Vaccine Event ID
- Mapping b/w Coding Systems
- Previously Submitted Vaccination Event
- Consolidated Immunization History Following Updates/Deletes

Questions and/or Comments

Please direct questions and/or comments via AIRA's Technical Assistance Request form.

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Appendix A: Report Limitations and General Recommendations

Report Limitations

- Some tests may not be able to leverage the ACK while others may not be able to leverage the RSP due to measure design and requirements.
- Analyzing the RSP will be used as a second method to determine success but may also lead to an occasional false positive.
    - This approach was preferred over not analyzing the RSP, which could lead to a larger set of false negatives as well as only one possible way to pass a test.
- IIS who meet a measure through their ACK message do not have their RSP analyzed.
    - The ACK message is used as evidence of detecting poorly submitted data. No further assessment is performed to verify how that poor data is stored and/or returned via query.
- The IIS does not need to have perfect ACK or RSP conformance for this content area.
    - HL7 conformance is measured in the Submission/Acknowledgment and Query/Response content areas. However, the IIS must populate key fields appropriately for them to be analyzed.
        - For example, ERR-2 is the error location where the error occurred in the VXU message. The IIS must populate this field properly. The testing program will not "look" in other ACK segments or fields to derive or imply the data-quality error was detected.
- The error severity found in ERR-4 (i.e., I, W, or E) will not be considered. Any severity is acceptable per local IIS business rules.

General Recommendations

1. Continued education and direction
    a. Both are needed on ACK messaging to ensure IIS are implementing standards consistently across all systems. The ACK is becoming the face of the IIS and is the only way to determine in an automated and timely fashion if the submitted data were accepted by the IIS. Positive movement is being seen by select IIS, but more work is needed to successfully communicate with certified electronic health records (EHRs) in a standardized way.
2. Standard alignment among partners
    a. Operationally, IIS should coordinate with their interface partners to jointly align with standards while, whenever possible, not disabling existing interfaces. It is important to communicate to partners that modifications may

demand short-term work but yield long-term gains in faster and easier interoperability and interface development.