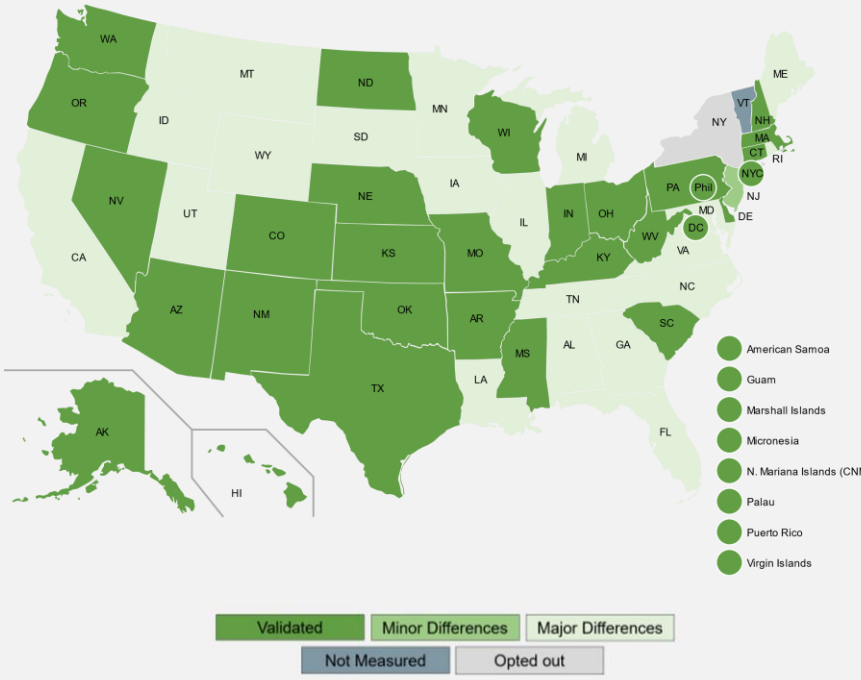
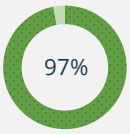
QUERY/RESPONSE VALIDATION
Complete Level

2025

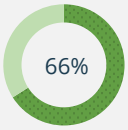
AIRA
AMERICAN IMMUNIZATION REGISTRY ASSOCIATION

M&I
MEASUREMENT & IMPROVEMENT





59 of 61 (97%) IIS were connected to the testing process and measured.



39 of 59 (66%) connected IIS were Validated or Validated with Minor Differences at the complete level for Query/Response.

The American Immunization Registry Association (AIRA) launched its community-driven immunization information system (IIS) Measurement and Improvement (M&I) Initiative in mid-2015, with the dual goals of providing IIS with information to align with IIS Functional Standards and developing a summary of IIS community alignment progress with best practices and standards. This report contains the results of IIS that have been measured within Validation, the final stage of the M&I process.

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Introduction

Overview: The measurement process for Query/Response 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 query and response 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.

Background: Query/Response moved into the Measurement and Improvement (M&I) stage of Validation in 2016. Validation testing occurs quarterly. Query/Response Validation Summary reports are updated twice a year, and an IIS can achieve either Basic or Complete Validation during either half of the year. Once achieved, Validation is considered active for the calendar year. This report contains the Complete Validation results from Quarter 4, 2025 (October through December).

Measures: Measurement for Assessment and Certification Workgroup (MACAW), the advisory body for M&I, approved measures and tests for Query and Response Validation in June 2019. The detailed measures and tests document is located on the AIRA repository. Measures and tests are based on the IIS Functional Standards v5.0. Query/Response measures and tests are specifically based off the following:

- **Functional Standard C5.0**: Manage interfaces for exchange and integration of data electronically between the IIS and other information systems in accordance with federal and jurisdictional standards.
- **Guidance Statement C5.1**: The IIS exchanges data in accordance with current interoperability standards endorsed by CDC for message content, format, and transport.
- **Functional Standard E7.0**: The IIS ensures authorized users have access to patient demographic and vaccination data based on user roles and permissions.
- **Guidance Statement E7.5**: The IIS supports authorized IIS partners' and providers' appropriate access to data in the IIS for public and population health purposes (e.g. childcare, schools, college, health plans, clinics).

Testing Method: To evaluate the ability of IIS to process and respond to queries, AIRA conducts a series of tests using conformant HL7 messages. Each test case is isolated to a single measure and simulates realistic scenarios such as one-to-one patient matches, no matches, and multiple potential matches. Test cases assess both structural conformance and appropriate handling of data across various profiles (e.g., Z32, Z42, Z33). Timing is also measured, with IIS expected to respond to 95% of queries within 5 seconds. Testing

ensures the IIS can reliably return immunization records and forecasts in alignment with CDC-endorsed HL7 implementation guidance. Each measure has at least one test case but may have more as needed. In total, 13 test cases were developed, reviewed, and approved across the 8 measures. Test cases were developed to isolate the test case to the measure; expectations for a test case should be few, not many; and focus on proper behavior based on standards.

Results: This report provides results for the **complete** level of Query/Response Validation; results for the **basic** level can be found here. Summary information is presented for all measured IIS; individual results are available to authorized users in AART. IIS can achieve the following **complete** level statuses for Query/Response:

- **Validated**: The IIS meets Measures 1–4 and 6-8.
- **Validated with Minor Differences:** The IIS deviates in one or more measures
- **Major Differences:** The IIS does not meet one or more measures
- **Not Measured:** The IIS was not able to be tested at this time.
- **Opted Out:** The IIS has chosen not to be measured.

Results

Below are the results for complete level of Query/Response Validation from Quarter 4, 2025. Unless an IIS declares otherwise, the functionality tested in preproduction is presumed to be available to end users in production.

The 61[1] IIS participating[2] in AIRA's M&I Initiative were encouraged to be formally measured in query/response Validation. Of the 61 IIS, **59 (97%)** were connected to the testing process and measured. Of those measured, **39 (66%)** were **Validated** or **Validated with Minor Differences** at the complete level for query/response. Another 20 IIS were measured but displayed major differences with the standard, most of which were focused on conformance of the response message. One IIS was not able to be measured at this time, while one opted not to be measured in Query/Response Validation.

Commented [AC1]: @nick and @megan -- the section is formatted differently than the Transport basic report which has a bulleted summary, consider making the section uniform across all validation summary reports

[1] Note that 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 IIS.
[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.

Below are the results for the complete level of Query/Response Validation from Quarter 4, 2025 in tabular form.

Table: Query/Response Validation, complete level Quarter 4, 2025

Validation Status and Definition	IIS
Validated: The IIS meets Measures 1–4 and 6–8.	Alaska, American Samoa, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Guam, Hawaii, Indiana, Kansas, Kentucky, Marshall Islands, Massachusetts, Micronesia, Mississippi, Missouri, N. Mariana Islands, Nebraska, Nevada, New Hampshire, New Mexico, New York City, North Dakota, Ohio, Oklahoma, Oregon, Palau, Pennsylvania, Philadelphia, Puerto Rico, South Carolina, Texas, US Virgin Islands, Washington, West Virginia, Wisconsin
Validated with Minor Differences: The IIS deviates in one or more measures.	New Jersey
Major Differences: The IIS does not meet one or more measures specified above.	Alabama, California, Florida, Georgia, Idaho, Illinois, Iowa, Louisiana, Maine, Maryland, Michigan, Minnesota, Montana, North Carolina, Rhode Island, South Dakota, Tennessee, Utah, Virginia, Wyoming
Not Measured: The IIS is not able to be tested at this time.	Vermont
Opted Out: The IIS has chosen not to be measured.	New York (State)

Conclusion

The IIS community continues to work towards full conformance with the IIS Functional Standards, with ongoing efforts to enhance functionality and align with community-driven standards. While results may vary due to evolving recommendations, standards updates, or differences in system implementation, the long-term trend is expected to show steady progress toward greater alignment across the IIS community.

Commented [AC2]: @nick @megan -- this section of the report vary in language or data points being included/not included across the validation reports. Would be nice if we could keep it uniform.

Published Validation reports provide transparency into this progress, offering insights into how IIS are advancing toward meeting these shared standards. AIRA staff are available to provide technical assistance to IIS programs and vendors as needed.

For more information on the Measurement and Improvement (M&I) Initiative, please visit AIRA's website. Questions and comments can be submitted via AIRA's Technical Assistance Request form.

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Appendix A: Glossary of Terms and Acronyms

AART: The Aggregate Analysis Reporting Tool, an application used to display and share results from the Measurement and Improvement process.

Assessment Stage: A more formal testing step to measure IIS using IIS community-selected measures and tests, to share those results for quality improvement, and to provide technical assistance to accelerate improvement. This is the second of three stages.

Basic Level: A level of Validation measurement that includes only essential measures to functionally meet this content area.

Complete Level: A level of Validation measurement that includes conformance to all measures approved for Validation.

Content Area: A category for measuring IIS functionality and capability within a specific functional area, made up of distinct measures and tests. Measures and tests will become more formalized as they progress into different stages.

MACAW: Measurement for Assessment and Certification Advisory Workgroup.

Major Differences Status: The IIS cannot support the measures because of additional requirements that conflict with the national standard; the IIS must make significant changes in one or more measures to align with standards.

Measure: A metric developed to measure how well an IIS aligns with IIS Functional Standards/operational guidance statements or another recognized standard.

Stage: A distinct period of testing in the Measurement and Improvement process.

Testing and Discovery Stage: A step in testing IIS to gather preliminary and general information on community alignment with standards. Testing and Discovery is the first of all the stages.

Validated Status: The IIS has achieved full alignment with community-selected measures.

Validated with Minor Differences Status: The IIS has achieved full alignment with community-selected measures except for differences that (1) are allowed by the standard (e.g., constraints) or (2) are meeting requirements of local policy/law that do not conflict with standard requirements.

Validation Stage: A summary step to acknowledge IIS that are progressing toward or achieving alignment with community-selected measures and tests. A Validation designation is automatically achieved when an IIS meets the designated measures and tests in a specific content area (e.g., Transport, Submission/Acknowledgment, Query/Response, etc.).

Appendix B: Measures/Methods – Additional Information

The **complete** level of Query/Response Validation contains seven measures.

1. The IIS processes a query requesting a patient's immunization record.
2. The IIS processes a query requesting a patient's evaluated immunization record and forecast.
3. The IIS responds to a query for a known patient (one-to-one match).
4. The IIS responds to a query for a patient that is not in the IIS.
6. The IIS responds to a query that has a significant error that cannot be accepted.
7. The IIS responds to a query for a known patient and returns known core data elements.
8. The IIS responds to a query with an RSP within five seconds or less for 95% of the queries submitted.