

Management of Patient Active/Inactive Status in Immunization Information Systems

Replacement of 2005 Guidelines

Recommendations of the
American Immunization Registry Association (AIRA)
Modeling of Immunization Registry Operations Work Group (MIROW)

April 13, 2015

Suggested citation:

AIRA Modeling of Immunization Registry Operations Work Group (eds). Management of Patient Active/Inactive Status in Immunization Information Systems: Replacement of 2005 Guidelines. Atlanta, GA: American Immunization Registry Association. April, 2015.

Note:

This document replaces the 2005 MIROW guide "Management of Moved or Gone Elsewhere (MOGE) Status and other Patient Designations in Immunization Information Systems" http://www.aira.browsermedia.com/resources/MIROW-MOGE_Chapter_Final_122005_rev1.doc

Executive Summary

Background

The Modeling of Immunization Registry Operations Work Group (MIROW) was formed in 2005 by the American Immunization Registry Association (AIRA) in partnership with the National Center for Immunization and Respiratory Diseases (NCIRD) at the Centers for Disease Control and Prevention (CDC) to develop a best practices guidebook for IIS. This document is one chapter of the guidebook. It provides consensus-based best practice recommendations to support management of patient active/inactive statuses in IIS, and replaces the 2005 MIROW guide “Management of Moved or Gone Elsewhere (MOGE) Status and other Patient Designations in IIS” [1.7].

The management of patient active/inactive status (PAIS) topic is especially relevant for the IIS community today because of initiatives to promote and advance the use and exchange of clinical data in electronic format. These initiatives led to a significant increase in collaborations between IIS and other health information systems, such as electronic health record (EHR) systems. Advances in electronic data exchanges between immunization provider organizations and IIS, as well as ongoing efforts to integrate some of the AFIX (Assessment, Feedback, Incentives, and eXchange) program functionality into IIS, make development of PAIS guidelines timely.

The guidelines focus on three aspects of patient active/inactive status:

1. Development of criteria to enter and exit various patient statuses at provider organization and geographic jurisdiction levels, with emphasis on issues of updating patient status via electronic data exchange.
2. Development of criteria to include patients in assessment reports and reminder-recall notifications based on their status.
3. Support of ongoing efforts to integrate some of the AFIX program’s functionality into IIS.

Relevance

Patient active/inactive status is relevant to three aspects of IIS operations:

1. Capture of information by an EHR (as well as a Direct UI) and transmission of the information to an IIS.
2. Interpretation of information in incoming data by an IIS to assign PAIS.
3. Application of PAIS guidelines to existing data in the IIS.

Patient active/inactive status (also referred to as “patient status” or “status”) is important to determine which individuals to include in assessments and to decide which patients receive reminder-recall notifications. Inappropriate classification of PAIS can result in inaccurate assessments and reminder-recall notifications. Inconsistent definitions among various IIS could result in poor data comparability and data quality issues. As data sharing increases among IIS programs at the federal and state level, there is a need to use consistent and agreed upon PAIS definitions and rules to promote the integrity of the information contained in IIS and consistency and comparability between and within state and local data sources.

PAIS is a term used to describe responsibility for immunization of an individual at a provider organization or geographic jurisdiction level. In other words, PAIS is a designation of the relationship of an individual with a provider organization or the jurisdiction in which the individual resides. PAIS at the provider organization level conveys information with respect to the relationship of a patient to a provider organization. PAIS at a geographic jurisdiction level conveys information with respect to the relationship of an individual to a jurisdiction.

Active status of an individual with a provider organization or jurisdiction indicates that the provider organization or jurisdiction has responsibility for immunization of that individual. Inactive status of an individual with a provider organization or jurisdiction indicates that the provider organization or jurisdiction does not have responsibility for immunizations of an individual.

From the public health perspective, it is important to maintain statuses for a patient/individual in a hierarchical manner, with a classification of immunization statuses defined on each level of this hierarchy (e.g., at provider organization and geographic jurisdiction [city, county, and

state] levels. A hierarchical structure of statuses ensures there is always a party responsible for immunization of every individual. For example, if an individual does not have “active” status with any provider organization, there would be no responsibility for this individual’s immunization at the provider organization level, but on the next level of hierarchy, a public health authority would be responsible for immunization of this individual.

Key outcomes and accomplishments

The guidelines describe two common approaches for implementing the concept of a provider organization having “responsibility” for immunizing a patient. Some IIS allow only one provider organization to have responsibility for a patient at a time, referred to as a “1 to 1” approach. Other IIS allow more than one provider organization to have responsibility for a patient simultaneously, referred to as a “1 to many” approach. Both approaches are acceptable for reminder-recall notifications and assessment reports.

Recommendations developed by the work group have been documented in this guide using 13 business rules (representing specific requirements and decision-making logic for IIS processes and operations), 14 principles (high level business rules that help to capture institutional knowledge and to guide the development of more specific business rules), 4 decision tables, and 22 operational scenarios. The work group defined 5 patient statuses at the provider organization level and 5 patient statuses at the geographic jurisdiction level.

Patient statuses and *examples* of how status is determined at the provider organization level are:

- Active. If a provider organization sends demographic and immunization information for an individual to the IIS and identifies that individual as a patient, then [BR402A](#) or [BR402B](#) is applied and the status is set to “Active” with that provider organization.
- Inactive, with the following reason codes:
 - No longer a patient. If the relationship between a provider organization and a patient is terminated because the patient has gone or transferred to another provider organization or the patient has moved out of the area, then [BR404A](#) or [BR404B](#) is applied and the status is changed to “Inactive” with the reason code “No longer a patient.”
 - Lost to follow-up. If contact is lost with a patient and documented attempts have been made to locate and contact the patient with no response received, then [BR405](#) is applied and the patient is moved from a status of “Active” to a status of “Inactive” with the reason code “Lost to follow-up.”
 - Unspecified. For electronic data exchange in which the provider organization is not technically able to specify a reason for an “Inactive” status, [BR406](#) is applied and status at the provider organization level is set to “Inactive” with the reason code “Unspecified.”
- Deceased. If a patient’s death is confirmed, then [BR421](#) is applied and the status is set to “Deceased” at the provider organization level.

Individual statuses and *examples* of how status is determined at the geographic jurisdiction level are:

- Active. If an individual’s residence within the geographic jurisdiction has been confirmed, or if an individual received an immunization from a provider organization within the geographic jurisdiction and the individual’s address is not known, [BR412](#) is applied and the status at the geographic level is set to “Active.”
- Inactive. If an individual does not reside in the geographic jurisdiction, [BR413](#) is applied and the individual status at the geographic jurisdiction level is set to “Inactive” with the reason code “Outside jurisdiction.”
- Unknown, with the following reason codes:
 - No address – no vaccination. If the IIS has never received an address and has never received vaccination information about an individual, [BR414](#) is applied and the status at the geographic jurisdiction level is set to “Unknown” with the reason code “No address – no vaccination.”
 - No activity for extended period of time. If the IIS has not received demographic and/or immunization information for an individual for an extended period of time, [BR415](#) is applied and the individual’s status at the geographic jurisdiction level is set to “Unknown” with the reason code “No activity for extended period of time.”
- Deceased. If a patient’s death is confirmed, then [BR421](#) is applied and the status is set to “Deceased” at the geographic jurisdiction level.

The guidelines contain [decision tables](#) with recommendations on how to use patient status when selecting a cohort for reminder-recall notifications and assessment reports. For reminder-recall notifications at the provider organization level, patients with “active” status at the provider organization level will be included in the notifications and patients with “deceased” and “inactive” status will be excluded. For reminder-recall notifications at the geographic jurisdiction level, patients with “active” status at the geographic jurisdiction level will be included in the notifications, patients with “inactive” and “deceased” status will be excluded from the notifications, and the IIS can decide whether to include or exclude patients with “unknown” status.

A great variety of provider organization level assessments use IIS data. The guidelines present consensus-based best practice recommendations for selecting a population cohort for assessment reports (which are also applicable to selection of a population cohort for AFIX assessment reports) at the provider organization level. For assessment reports at the provider organization level, patients with “active” status will be included and patients with “deceased” and “inactive” status will be excluded. For assessment reports at the geographic jurisdiction level, patients with “active” and “unknown” status will be included, and patients with “inactive” and “deceased” status will be excluded. It should be noted that inclusion of patients with “unknown” status might bias assessments by overestimating the number of individuals in the population who appear unvaccinated/under-vaccinated. Methods do exist to adjust for this bias; these are discussed in [Chapter 5](#) of this guide.

In addition to principles, business rules, and decision tables, the guidelines contain operational scenarios with resolutions for typical and challenging situations, and descriptions of how to use HL7 specification to transmit electronic data necessary to determine PAIS.

Conclusion

MIROW brought together experts from the IIS community, CDC, and IT vendors. The resulting best practices guide is a step in standardizing practices of managing patient status in IIS. The recommendations are intended for implementation at the business/operational level. As a result, they are independent from particular IIS implementations and technology solutions. Accordingly, the recommendations can support the wide variety of IIS implementation strategies on different technological platforms.

The National Vaccine Advisory Committee (NVAC) has included a recommendation to “promote the adoption of a guidebook and best practices for IIS as stated by the CDC/NIP [now NCIRD] and AIRA/MIROW Work Group to adopt consistent operational guidance and quality control procedures that ensure good data quality.” This best practices guide is one example of addressing the NVAC recommendation. It will assist IIS in aligning practices through adherence to a set of common recommendations and guidelines. As a result, IIS will be able to better serve the needs of immunization programs and provider organizations.

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Acknowledgments

Members of the Modeling of Immunization Registry Operations Work Group (MIROW) appreciate and acknowledge the following:

- External reviewers for their willingness to read and constructively critique the materials. Their efforts benefited this document significantly:
 - **Nate Czarnota**
 - **Kris Dupuis**
 - **Damon Ferlazzo**
 - **Therese Hoyle**
 - **Shirley Huie**
 - **Mary Beth Kurilo**
 - **Eric Larson**
 - **Tamara Lewis**
 - **Tracy Little**
 - **Dr. Marlene M. Lugg**
 - **Cynthia Rawn**
 - **Bea Salada**
 - **Susan Salkowitz**
 - **Rob Savage**
 - **Cherie Thomas**
- Facilitation support provided during the in-person meeting in Decatur, Georgia (June 17-20, 2014) by the team from Advanced Strategies, Inc.—**Kahil Branton, Gail DeCosta, Diane Gazaway, and Faith Bradberry.**
- Editorial support—**Ginger Redmon**, Writer/Editor at the Centers for Disease Control and Prevention (CDC).
- Administrative support of the AIRA staff—**Jennifer Bank**—for organizing modeling sessions.
- Contributions of the following organizations, which provided materials on patient active/inactive status issues to help frame the topic and prepare for the modeling sessions:
 - **Michigan Care Improvement Registry (MCIR)**
 - **Minnesota Immunization Information System—Minnesota Immunization Information Connection (MIIC)**
 - **Nevada State Immunization Information System (NV WebIZ)**
 - **New York Citywide Immunization Registry (CIR)**
 - **New York State Immunization Information System (NYSIIS)**
 - **Oregon State Immunization Information System—Oregon Immunization ALERT**
 - **Pennsylvania Statewide Immunization Information System**
 - **Philadelphia Immunization Information System—KIDS Plus**
 - **KIDSNET- Rhode Island’s Integrated Child Information System**
 - **Scientific Technologies Corporation**
- AFIX-IIS project team—**Danielle Reader-Jolley, Ruth Gubernick, and Susan Salkowitz**—for sharing materials and accommodating requests from the MIROW project team.

Navigation

Navigation Tips

- For a convenient navigation through chapters and sections, activate the navigation pane for this document (e.g., for MS Word via the following menu selections: "View → Navigation Pane <check box>", for Adobe Acrobat via the Bookmarks button).
- After navigating from the Table of Contents or via a hyperlink to a location within this document, use "Alt + ←" keystroke to return to the page where you started (for Adobe Acrobat and MS Word).
- Throughout this document, green **highlighting of text** is used for the **1-1 approach** and blue highlighting for the **1-M approach**. Therefore, it is best to print the document in color.

Overview of this document

- [Executive Summary](#)
Describes the background, relevance to the immunization community, and key recommendations.
- [Chapter 1: Introduction](#)
Introduces MIROW efforts, best practice guides developed previously, the current topic under development, analysis instruments used, intended audience, and principles of the work group collaborative consensus-based development approach.
- [Chapter 2: Scope](#)
Presents the focus and primary purpose for developing this topic, integration with other initiatives, and "in-scope"/"out-of-scope" designations.
- [Chapter 3: PAIS Fundamentals](#)
Introduces patient active/inactive status in the context of an immunization registration domain, two established approaches for managing patient status, and fundamental principles that help to capture institutional knowledge and guide the development of more specific business rules.
- [Chapter 4: PAIS Management](#)
Provides recommendations on nomenclature of patient statuses, as well as decision-making logic, expressed in business rules, for assignment of every status.
- [Chapter 5: Using PAIS for Reminder-Recall and Assessment Reports](#)
Provides recommendations on using patient statuses when selecting a cohort for reminder-recall notifications and assessment reports.
- [Chapter 6: Operational Scenarios](#)
Presents typical and challenging operational scenarios that illustrate implementation of best practice recommendations.
- [Chapter 7: Implementation Considerations](#)
Contains HL7 examples and cross-references with terms used in this guide.
- [Appendix A: Terms and Definitions](#)
Terms and definitions for this area of immunization registration captured via a domain model.
- [Appendix B: Comparison of Patient Statuses with 2005 MOGE guide](#)
Patient active/inactive statuses, defined in this document, are compared side-by-side with statuses defined in the 2005 MOGE Guide

Recommended reading paths

The following reading paths represent a minimalistic approach. A curious reader interested in detailed understanding of “who, what, why, where, when” aspects of patient status, should read the entire document, starting with [Appendix A: Terms and Definitions](#).

Program Managers:

- [Executive Summary](#)
- [Chapter 3: PAIS Fundamentals](#)
- [Chapter 5: Using PAIS for Reminder-Recall and Assessment Reports](#)

Immunization Program Staff:

- [Chapter 3: PAIS Fundamentals](#)
- [Chapter 4: PAIS Management](#)
- [Appendix B: Comparison of Statuses with 2005 MOGE Guide](#)
- [Chapter 5: Using PAIS for Reminder-Recall and Assessment Reports](#)
- [Chapter 6: Operational Scenarios](#)
- [Chapter 7: Implementation Considerations](#)

Technical Developers:

- [Appendix A: Terms and Definitions](#)
- [Requirements vs. implementation](#) section of Chapter 2
- [Chapter 4: PAIS Management](#)
- [Chapter 5: Using PAIS for Reminder-Recall and Assessment Reports](#)
- [Chapter 6: Operational Scenarios](#)
- [Chapter 7: Implementation Considerations](#)
- [Appendix B: Comparison of Statuses with 2005 MOGE Guide](#)

Also, brochure-type MIROW mini-guides summarizing highlights of recommended best practices are available on the AIRA and CDC web sites:

<http://www.immregistries.org/resources/aira-mirow>

<http://www.cdc.gov/vaccines/programs/iis/activities/mirow.html>

Chapter 1: Introduction

About MIROW

The Modeling of Immunization Registry Operations Work Group (MIROW) of the American Immunization Registry Association (AIRA) was formed in partnership with the National Center for Immunization and Respiratory Diseases at the Centers for Disease Control and Prevention to develop a topic-by-topic best practices guidebook for various functional aspects of immunization information systems (IIS). Since 2005, MIROW has developed several operational guidelines for the following IIS functional areas (see [Table 1](#)): Data Quality Assurance – Selected Aspects, Inventory Management, Patient Eligibility for the VFC Program and Grantee Immunization Programs, Reminder/Recall, Incoming Data Quality Assurance – Incoming Data, Vaccination Level Deduplication, Patient Status (i.e., Moved or Gone Elsewhere [MOGE] Status and other Patient Designations in IIS;replaced by this document), and IIS-Vaccine Adverse Event Reporting System Collaboration (pilot project).

MIROW recommendations documents, abridged mini-guides, and other materials are available at the AIRA and CDC web sites.

Presentations that describe MIROW's efforts:

- "Development of Best Practices for Immunization Information Systems," AIRA 2012 IIS Meeting
http://www.immregistries.org/resources/iis-meetings/Final_-_MIROW_Plenary_presentation_at_the_2012_AIRA_Meeting_09-18-2012.pdf
- "Evaluating IIS Best Practice Operational Guidelines: Emerging Trends and Challenges," 44th National Immunization Conference
<http://cdc.confex.com/cdc/nic2010/webprogram/Paper22530.html>

Table 1. MIROW: Topics/workshops overview

	Guideline document released	Face-to-face meeting	Subject Matter Experts panel size	Guideline document highlights
Management of Patient Active/Inactive Status in IIS (current topic)	March 2015	June 2014 3.5 days Decatur, GA	13	14 principles 13 business rules 4 decision tables 22 operational scenarios
Data Quality Assurance in IIS: Selected Aspects [1.1]	May 2013	August 2012 3.5 days Decatur, GA	13	2 principles 27 business rules 7 general recommendations 27 updated business rules
IIS Inventory Management Operations [1.2]	June 2012	September 2011 3.5 days Atlanta, GA	14	8 principles 25 business rules 23 general recommendations 20 key reports
IIS-VFC/Grantee Programs Collaboration [1.3]	April 2011	June 2010 2.5 days Atlanta, GA	14	26 eligibility screening scenarios 17 business rules 9 general recommendations
Reminder/Recall in IIS [1.4]	April 2009	October 2008 2.5 days Tampa, FL	13	29 principles 23 business rules 30 general recommendations
Data Quality Assurance in IIS: Incoming Data [1.5]	February 2008	August 2007 2.5 days Atlanta, GA	11	13 principles 32 business rules
Vaccination Level Deduplication in IIS [1.6]	December 2006	May 2006 2.5 days Washington, DC	20	9 principles 20 business rules 23 illustrative scenarios (examples)
Management of Moved or Gone Elsewhere (MOGE) Status and other Patient Designations in IIS (replaced by this document) [1.7]	December 2005	August 2005 2.5 days Atlanta, GA	16	6 statuses defined on the Provider level, 5 statuses on the Geographic Jurisdiction level
IIS-VAERS Guide (pilot project) [1.8]	April 2005	June 2004 1.5 days Atlanta, GA	21	10 functional standards, 8 business rules, 11 alternative scenarios (process)

This document, "Management of Patient Active/Inactive Status in IIS" (current topic), replaces the 2005 MIROW guide, "Management of Moved or Gone Elsewhere (MOGE) Status and other Patient Designations in IIS" [1.7].

About this project: “Management of Patient Active/Inactive Status in IIS”

The current report represents MIROW’s efforts to develop best practice recommendations for management of patient active/inactive status in IIS.

The management of patient active/inactive status topic is especially relevant for the IIS community today because of the Meaningful Use [Electronic Health Records \(EHR\) Incentive Programs](#) and other efforts to promote and advance the use and exchange of clinical data in electronic format. These efforts led to a significant increase in collaborations between IIS and other health information systems such as electronic health record (EHR) systems. Advances in electronic data exchanges between immunization provider organizations and IIS, as well as ongoing efforts to integrate some of the AFIX program functionality into IIS, make development of this guide timely. Management of patient status guidelines are useful for many immunization program functions (particularly the AFIX functionality), IIS, and their partners to reference for electronic data exchange issues, as well as operational issues with conducting assessments and reminder-recall activities.

This document focuses on the following three aspects of patient active/inactive status designations:

1. Development of criteria (business rules) to enter and exit various patient statuses at provider organization and geographic jurisdiction levels, with emphasis on issues of updating patient status via electronic data exchange.
2. Development of criteria (decision tables, business rules) to include patients in assessment reports and reminder-recall activities based on their statuses.
3. Support of ongoing efforts to integrate some of the AFIX program’s functionality into IIS instead of housing this functionality with the CoCASA system.

The development process consisted of a preliminary phase that included Web-based teleconferences held April-June 2014, face-to-face meetings held June 17-20, 2014, in Decatur, Georgia, and post-meeting activities (July 2014-February 2015) to finalize the recommendations.

About this document

This document provides consensus-based best practice recommendations for managing patient status in IIS and replaces the 2005 MIROW “Management of Moved or Gone Elsewhere (MOGE) Status and other Patient Designations in IIS” guide [\[1.7\]](#).

Business modeling instruments

The recommended best practices were formulated using business modeling instruments:

- Domain model ([Appendix A](#)) — documents agreed-upon terms and definitions for the project. Establishes a foundation and a reference source (common vocabulary) for other project materials (e.g., principles, business rules, general recommendations).
- Principles ([Chapter 3](#), PAIS Fundamentals) — provide high-level direction that helps to guide the development of more specific business rules.
- Business rules ([Chapter 4](#), PAIS Management) — represent specific requirements and decision-making logic for assigning patient status.
- State diagrams ([Chapter 4](#), PAIS Management) — visually illustrate the nomenclature of patient status and transitions from one status to another.
- Decision tables ([Chapter 5](#), Using PAIS for Reminder-Recall and Assessment Reports) — describes decision making when selecting a cohort for reminder-recall and assessment activities.

The following assumptions reflect the MIROW approach to the development of principles and business rules, general recommendations, and associated best practices presented in this document:

- The focus should be on recommendations and business rules that have the greatest potential for providing value and use across all IIS.
- The business rules represent an attempt to balance ideal possible practices with pragmatic considerations of what will be possible to implement in an IIS.
- Specific implementation of business rules (and associated best practices) may vary based on resources, goals, needs, and unique implementation concerns.

- The set of business rules and other recommendations presented here is not exhaustive. Each individual IIS may choose to implement additional rules based on its unique requirements and insights.
- Finally, the business rules and associated best practices are not static—they will need to change and evolve over time as business requirements change.

Implementation/technology independence

MIROW best practice recommendations are intended to be at the business/operational level and, as a result, are independent from particular IIS implementations and technology solutions. Since this process incorporates an industry-wide strategic approach to capturing and maintaining business knowledge, requirements, and policies/constraints that are independent of implementation architecture and technical solutions, these best practice recommendations will be able to support the wide variety of IIS implementation strategies on different technological platforms.

Intended audience

The recommendations outlined in this guide are designed to be read by programmatic, technical, and operational personnel involved in creating or maintaining an IIS, awardee immunization program staff, as well as vendors of health care information systems and providers of immunization services. The guide is intended to bridge the gap between IIS technical and program staff, IIS and awardee immunization programs, and IISs and their partners. Bridging these gaps will help create a mutual understanding of common issues and identify actions to implement/apply these recommendations.

Intended use

This guide contains a set of recommended operational best practices (including a set of principles and business rules to follow) that are intended as a basis for requirements in IIS applications and operations. In addition, this guide can be used by IIS for staff training, operational documentation, and communication purposes, and for providing guidance for vendors and users of electronic health record (EHR) applications.

The implementation of best practice recommendations will vary based on the specifics of a particular IIS and its interaction with EHR vendor technology and application architecture. Also, resource constraints and required changes to existing functionality may result in **incremental adoption** of these guidelines.

The approach used and results presented are relevant for and can be utilized beyond IIS (e.g., for developing and documenting best practices and operational requirements for domain-specific applications in public health, health care, and other areas).

Development approach

MIROW used business engineering and facilitation techniques to analyze IIS processes and develop recommendations. It utilized a pragmatic results-oriented approach that has been effective for modeling of IIS and cancer registration operations. Initial **preparatory off-line work** (assembling pertinent materials, producing preparatory notes, analyzing processes, and developing preliminary drafts) was conducted by a business analyst and subject matter experts (SMEs). During a subsequent **face-to-face facilitated modeling session** held on June 17-20, 2014 in Decatur, Georgia, the work group of SMEs used these preparatory materials to frame and scope resources and began developing and formulating consensus-based recommendations. The **post-session work** finalized the development of recommendations. The SMEs addressed a set of remaining issues during a series of teleconferences. The goal was a consensus among SMEs regarding best practice recommendations which did not require 100% agreement, but rather, meant **"I can live with that and support it."** While the first part ("can live with that") allowed the group to focus on achieving a consensus in principle, avoiding prolonged discussions on minor issues (when at least no one disagrees strongly enough to veto the agreement), the second part ("support it") provided a due diligence check to ensure there were no serious disagreements left among the experts, assuring that experts agreed with the recommendation sufficiently to stand behind it and support it.

Chapter 2: Scope

Primary purpose:

To update operational best practices reflected in the AIRA/MIROW 2005 guide titled “Management of Moved or Gone Elsewhere (MOGE) Status and Other Patient Designations in Immunization Information Systems” [1.7] emphasizing new perspectives that were not addressed in the 2005 guide: AFIX coverage assessments and electronic data exchange. This document replaces the 2005 MIROW guide.

Focus:

There are many types of associations which could be tracked by the IIS. *This document focuses on the status that characterizes associations of individuals/patients with immunization providers and public health authorities related to selecting a cohort for reminder-recall and assessment reports.* However, other associations and their characteristics (statuses), outside of the scope of this document could be (and are) tracked by IIS.

Integration with other initiatives:

Development of this guide was coordinated with efforts to integrate the AFIX program functionality (the provider assessment functions) into IIS (instead of housing this functionality with the CoCASA system). AIRA convened a panel of subject matter experts to develop “AFIX-IIS Integration Operational and Technical Guidance for Implementing IIS-Based Coverage Assessment — Phase 1” (AFIX-IIS panel). This document supports the AFIX-IIS panel’s recommendations by defining patient status used to select cohorts for AFIX assessment reports.

Including (in scope):

- Patient status definition at the following levels:
 - Provider Organization — healthcare/clinical level
 - Geographical Jurisdiction — population/public health levels (such as state, city, county, region)
- Establishing status indirectly (i.e., if status information is missing from submissions) based on other data items available
- Impact of patient status on immunization coverage assessments
 - Primary: AFIX assessments
 - Secondary: other assessments (e.g., jurisdictional-level coverage: state/county/city/zip code) as time permits
- Impact of patient status on reminder-recall notifications
- All age cohorts: children, adolescents, adults

Excluding (out of scope):

- *The impact of patient status on other areas of immunization programs, beyond selecting a cohort for assessments and reminder-recalls*, for example, Vaccines for Children (VFC) profiles of provider organizations as they relate to vaccine ordering and pre-assessment review of candidate patients for AFIX and other assessments.
- Implementation specifics (e.g., design solutions, technology-specific considerations, HL7 v2.5.1 specifications [but see [Chapter 7: HL7 Immunization Messaging Considerations](#)])
- VFC and AFIX programmatic-level recommendations, such as recommendations regarding AFIX coverage assessment, other than directly related to patient status (all other recommendations regarding AFIX coverage assessments are included in the AFIX-IIS Integration Operational and Technical Guidance for Implementing IIS-based Coverage Assessment – Phase 1)
- Data quality considerations, including deduplication (patients are assumed to be deduplicated).

Operational-level analysis requirements vs. implementation-level design solutions

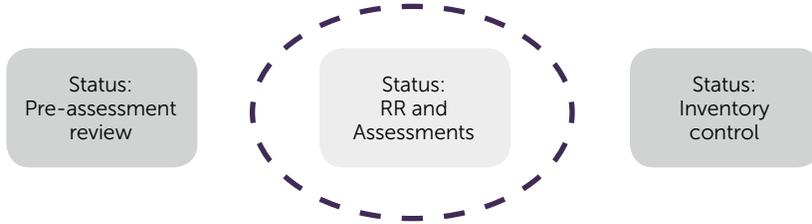
Best practice recommendations described in this document should reflect results of requirements analysis performed at the operational level. Design solutions that an IIS employs to implement the concept of patient status are out of scope for this document. Note, that the MIROW SMEs do not endorse or recommend any particular implementation-level design over any other design.

A sketch in [Figure 1](#) depicts three functional areas where a patient status concept characterizing associations between patients and provider organizations, are commonly employed by IIS:

- Reminder-recall and assessment reports.
- Pre-assessment review (evaluation of “candidate” patients for inclusion/exclusion in the cohort for assessment); see section [Implementation considerations for pre-assessment review](#) in Chapter 5 of this guide.
- Inventory control (determination of current and future vaccine ordering needs for both provider organizations and immunization programs).

Operational-level recommendations for these functional areas (top part of the sketch) can be satisfied with a variety of implementation approaches (bottom part of the sketch). In principle, each of the three functional areas can be supported with implementation of its own status, designated exclusively for one area (Design #1). Some of the existing IIS design solutions “stretch” the patient status concept to support other functional areas, such as pre-assessment review and inventory control, with a single data field that is common for all three areas. Designs #2 and #3, shown at the lower part of the sketch, illustrate such “expanded” implementation of the patient status. All of these design solutions are capable of supporting best practice recommendations for a “narrowly” defined area of reminder-recall and assessment reports described in this guide. An additional step of screening patients with “broadly” defined active status or execution of additional logic is employed by these implementation solutions.

Status concepts supporting various functional areas



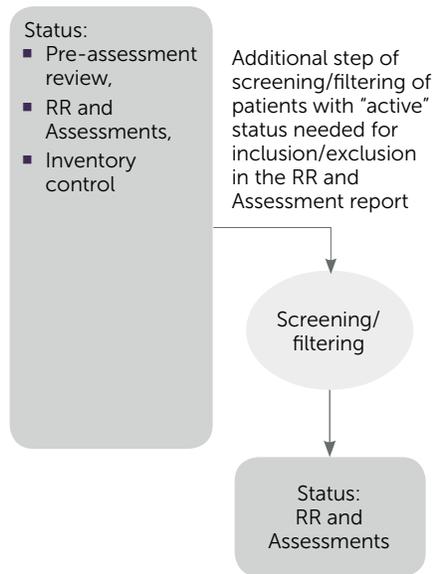
MIROW recommendations for status supporting RR and Assessments functional area are formulated at the conceptual level and can be satisfied with various implementation approaches, as shown below.

Implementation of status concepts (above) supporting various functional areas

Design #1:
each status concept implemented with one designated data structure (e.g., data field)



Design #2:
all status concepts implemented with one common data structure (e.g., data field)



Design #3:
all status concepts implemented with two common data structures (e.g., data field)

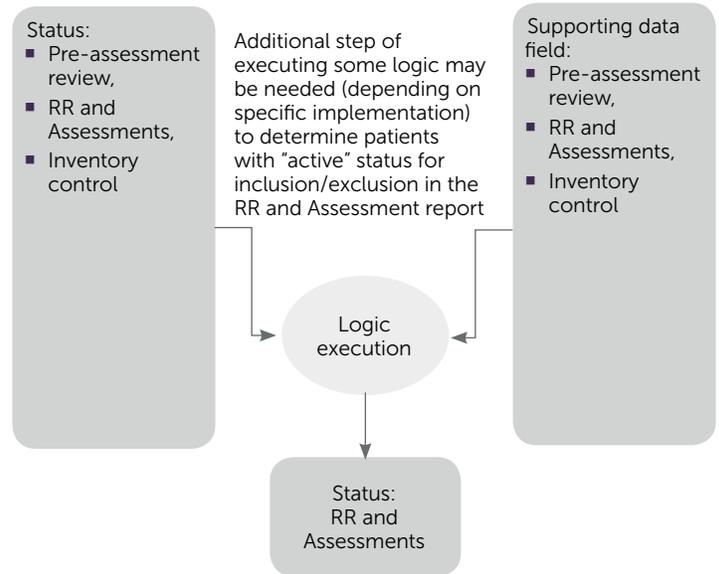


Figure 1. Operational-level concepts vs. implementation-level design solutions

Chapter 3: PAIS Fundamentals

Introduction to PAIS

Patient active/inactive status (PAIS, also referred to as “patient status” or “status”) is important to determine which individuals/patients to include in coverage assessment and to decide which patients receive reminder-recall notifications. Inappropriate classification of PAIS can result in inaccurate assessments and reminder-recall notifications. Inconsistent definitions among various IIS could result in poor data comparability and data quality issues. As data sharing increases among IIS programs at the federal and state level, there is a need to use consistent and agreed upon PAIS definitions and rules to promote the integrity of the information contained in IIS and consistency and comparability between and within state and local operations.

PAIS is a ranking term used to describe responsibility for immunization of the individual/patient at a provider organization or geographic jurisdiction level. In other words, PAIS is a designation of the relationship of an individual/patient with a provider organization or the jurisdiction in which the individual/patient resides. PAIS at the provider organization level conveys information with respect to the relationship of a patient to a provider organization. PAIS at a geographic jurisdiction level conveys information with respect to the relationship of an individual to a jurisdiction.

Note that for readability, the term “patient” in this document may be used instead of the more appropriate term “individual/patient.” See [Appendix A](#) for terms and definitions used in this document.

PAIS expresses the concept of responsibility for immunization of a patient. A healthcare provider organization is responsible for the immunization of its patients. One or more public health authorities (on local, state, or federal levels) are responsible for the immunization of the population as a whole within their jurisdiction (or more precisely, for individuals that make up that population). Assignment of a PAIS to a patient/individual establishes a classification that can be used for immunization coverage assessments and reminder-recall notifications by parties responsible for immunization, as well as for a variety of other public health and healthcare purposes.

From the public health perspective, it is important to maintain statuses for a patient/individual in a hierarchical manner, with a classification of patient statuses defined on each level of this hierarchy (e.g. at the provider organization and the geographic jurisdiction [city, county, and state] levels). A hierarchical structure of statuses ensures there is always a party responsible for immunization of every individual. For example, if an individual does not have “active” status with any provider organization, there would be no responsibility for this individual’s immunization at the provider organization level, but on the next level of hierarchy, a public health authority would be responsible for this individual’s immunization. To ensure there is always a party responsible for the immunization of each individual, generally speaking, there should be a more rigid approach to assigning “non-active” status at the geographic jurisdiction level compared to the provider organization level.

Specific statuses (i.e., active, inactive, etc.) at provider organization and geographic jurisdiction levels, as well as rules for a transition from one status to another are presented in Chapter 4, “PAIS Management,” of this document.

1-1 and 1-M approaches

IISs have two common approaches to implementing the concept of a provider organization having responsibility for immunizing a patient. Some IISs allow only one provider organization to have responsibility for a patient at a time (i.e., “1 to 1” approach). Other IISs allow more than one provider organization to have responsibility for a patient simultaneously (i.e., “1 to many” approach).

Throughout this document

■ The following shorthand is used to refer to these two approaches:

- 1-1:1 to 1 approach
- 1-M: 1 to many approach

Following are key points regarding these two approaches:

- Both 1-1 and 1-M are valid best practice approaches for determining PAIS at the provider organization level.
- When the 1-1 approach is used, a patient may be included in reminder-recall notifications and assessment reports for only one provider organization at a point in time, but when the 1-M approach is used, a patient may be included in reminder-recall notifications and assessment reports for more than one provider organization at the same time.
 - Note that even for the 1-1 approach, a patient who changed provider organizations may be included in assessment reports for more than one provider organization over a period of time (at different points in time).
- These two approaches are more similar to each other than might be apparent at first glance. In the 1-1 approach, the provider organization responsible for a patient’s immunizations would be one of provider organizations responsible for the same patient in the 1-M approach.
- The main idea behind the 1-M approach is to better support modern population trends, when many individuals, especially adults, do not have a single primary immunization provider, and to hold more provider organizations accountable for patients’ immunizations. Since several provider organizations have responsibility for the patient, there is a higher probability to get the patient back in for future immunizations. A potential drawback with such an approach is that multiple resources could be spent on some of the same efforts (i.e., reminder-recalls).

■ Green **highlighting of text** is used for the **1-1 approach** and blue highlighting is used for the **1-M approach**. Therefore, it is best to print this document in color.

■ The main idea behind the 1-1 approach is to maintain one provider with clear responsibility for the patient, as well as to focus resources for reminder-recalls and assessments on the single provider organization. Routinely, the provider that administered the most recent immunization is documented as the one provider bearing responsibility for that patient. A potential challenge with this approach can be seen in a scenario where the majority of vaccines are given by a provider organization other than the most recent provider organization. In such cases, selection of a single provider organization for the assessment may not reflect the provider organization that is most likely to see the patient on an ongoing basis.

Several operational scenarios presented in [Chapter 6](#) of this document illustrate basic differences between 1-1 and 1-M approaches. One of the indicative situations, when a patient receives immunizations from more than one provider, is described with scenarios [S301](#) and [S302](#).

Fundamental principles

A principle (P) is a high-level business rule. It is a high-level direction that helps to capture institutional knowledge and to guide the development of more specific business rules that represent specific requirements and decision-making logic for IIS processes and operations.

Principles are presented in Table 2 below:

- [P301](#). PAIS scope: association between one patient and one party
- [P302](#). PAIS hierarchy
- [P303](#). Avoid having individuals “fall through the cracks”
- [P304](#). Who may assign PAIS
- [P305](#). Make available information about PAIS changes
- [P306](#). Identification of an individual as a patient of a provider organization for purposes of reminder-recall and assessment
- [P307](#). Identification of an individual as NOT a patient of a provider organization for purposes of reminder-recall and assessment
- [P308](#). Supremacy of PAIS explicit assignment
- [P309](#). Same rules for public and private provider organizations
- [P310](#). “Out of state” patients
- [P311](#). PAIS should be maintained for patients of all ages
- [P312](#). Any submission should include PAIS
- [P313](#). Opt-out from IIS
- [P314](#). Opt-out from reminder-recall

Table 2. Fundamental principles for patient active/inactive status (PAIS)

#	Principles	Remarks
P301	<p>P301. PAIS scope: association between one patient and one party</p> <p>Each patient active/inactive status should characterize the association between one patient and one party responsible for the patient’s vaccinations.</p>	<ul style="list-style-type: none"> ■ There are many types of associations which could be tracked by the IIS. This MIROW topic is focused on PAIS which characterizes associations related to reminder-recall and assessment reports. <ul style="list-style-type: none"> ■ Opt-out from IIS is one example of these “other” associations. It has much larger (global) scope and is out of scope for this topic. See P313 and P314. ■ Provider organization(s) and geographic jurisdiction(s) are responsible for a patient’s vaccinations. ■ A patient may be associated with more than one provider organization at the same time (e.g., a patient can have an “active” patient status with multiple provider organizations at the same time in an IIS using the 1-M approach described above; a patient can have an “active” status with one provider organization and an “inactive” status with one or more other provider organizations at the same time in IIS using either the 1-1 or the 1-M approaches). A separate status indicator should be used to characterize each of these associations between patients and provider organizations. ■ An individual may be associated with multiple geographic jurisdictions (e.g., county, state) at the same time, as determined by each IIS. A separate status indicator should be used to characterize each of these associations.

#	Principles	Remarks
P 3 0 2	<p>P302. PAIS hierarchy</p> <p>Statuses for a patient/individual should be maintained in a hierarchical manner, specifically:</p> <ul style="list-style-type: none"> ■ At the provider organization level (lower level of the hierarchy) ■ At the geographic jurisdiction level(s) (higher levels of the hierarchy) 	<ul style="list-style-type: none"> ■ Hierarchy is needed to ensure there is a party (provider organization and/or geographic jurisdiction) responsible for the vaccination of each individual. <ul style="list-style-type: none"> ■ For example, if no provider organization considers an individual as a patient, there would be no responsibility for this patient’s vaccination at the provider organization level, but on the next level of hierarchy, a public health authority will be responsible for this individual’s vaccination. ■ Examples of the geographic jurisdiction level(s) of the hierarchy include: state, city, county, or other geographic area covered by a local public health authority. ■ Note that there can be more than one geographical jurisdiction level in the hierarchy. For example, in some cases, a state/city IIS (highest level of a geographic jurisdiction) maintains geographic patient status for individuals associated with local health departments (e.g., county, lower level of a geographic jurisdiction). <ul style="list-style-type: none"> ■ Status at the highest level of a geographic jurisdiction should always be present and correspond to the geographic area/ jurisdiction covered by the IIS (i.e., corresponding to the state or city, such as NY or NYC). In other words, the highest level geographic jurisdiction is directly tied to an IIS.
P 3 0 3	<p>P303. Avoid having individuals “fall through the cracks”</p> <p>A more rigid approach should be used in assigning “non-active” status at the geographic jurisdiction level than at the provider organization level.</p>	<ul style="list-style-type: none"> ■ This is a “safety net” provision that aims to avoid having people “fall through the cracks.” ■ An individual should maintain “active” status at a geographic jurisdiction level until any of the following occurs: (see Fig. 2): <ul style="list-style-type: none"> ■ Individual moves out of geographic jurisdiction (see BR413, Inactive status at the geographic jurisdiction level with the reason code “Outside jurisdiction”). ■ Individual is deceased (see BR421, Deceased status at the provider organization and geographic jurisdiction levels). ■ IIS has not received information about this individual for an extended period of time (see BR415, Unknown status at the geographic jurisdiction level with the reason code “No activity for extended period of time”).

#	Principles	Remarks
P 3 0 4	<p>P304. Who may assign PAIS</p> <p>PAIS at the provider organization level may be assigned by any of the following parties:</p> <ul style="list-style-type: none"> ■ Provider organization ■ Immunization program (at state, city, or county levels) <p>PAIS at the geographic jurisdiction level may be assigned only by the immunization program (at state, city, or county levels).</p>	<ul style="list-style-type: none"> ■ Note that IIS should maintain patient status at both provider organization and geographic jurisdiction levels (see P302). ■ IIS should have an automated process to actively monitor submissions of indirect information on patient's status and update the status in a timely manner (e.g., change in address could trigger a change in patient status). <ul style="list-style-type: none"> ■ IIS might consider implementing reports of patients whose information has not been updated over a specific time frame (per age cohort), and patients that have an "inactive" status but are receiving immunizations. ■ IIS should actively monitor submissions such as change of address, indicating that patient moved out of the highest level of geographic jurisdiction (state, city) and change PAIS accordingly (e.g., inactive, reason code "Outside jurisdiction," see BR413). Change of address may include a partial address (e.g., when only a state where the patient moved is known, as well as "address unknown" flag when a conclusion that the patient has moved outside of the geographic jurisdiction cannot be made). ■ A provider organization, by directly assigning PAIS, can override the IIS rules for indirect PAIS assignment. <ul style="list-style-type: none"> ■ See P308. Supremacy of PAIS explicit assignment. ■ EHRs should have a role in messaging patient status. Interfaces should be set up to allow for a provider organization to message patient status for a patient who has become inactive with this provider organization. ■ See P306. Identification of an individual as a patient of a provider organization.
P 3 0 5	<p>P305. Make available information about PAIS changes.</p> <p>IIS should make available to a provider organization the information about changes it makes to a status maintained for a patient associated with that provider organization.</p>	<ul style="list-style-type: none"> ■ Implementation consideration: IIS should consider implementing a "passive" notification solution by letting provider organizations know where they can find this information in the system (e.g., list of activated and inactivated patients). Such a solution would preclude the need for numerous notifications of changes to a patient status. ■ Implementation consideration: Status can be maintained in a dedicated field or virtually by calculating it every time when it is needed (especially for the geographic jurisdiction level). See Chapter 7 for a discussion. ■ In some cases, a state/city IIS (highest level of a geographic jurisdiction) maintains patient status for individuals associated with local health departments (lower level of a geographic jurisdiction). This principle (P305) should also be applied to such a setting (i.e., IIS should notify a local health department about changes it makes to the status of an individual associated with that local health department).

#	Principles	Remarks
P 3 0 6	<p>P306. Identification of an individual as a patient of a provider organization for purposes of reminder-recall and assessment</p> <p>Identification of an individual as a patient of a provider organization for purposes of reminder-recall and assessment may be done in any of the following ways:</p> <ul style="list-style-type: none"> ■ Direct: when at least one of the following is true: <ul style="list-style-type: none"> ■ A provider organization sets PAIS to “active” via Direct UI (user interface) or EDE (electronic data exchange). <p>IIS obtains documented information by some other means (see remarks).</p> <ul style="list-style-type: none"> ■ Indirect: when a provider organization’s responsibility for a patient is implied by IIS by any of the following actions of the provider organization: <ul style="list-style-type: none"> ■ Conducts vaccination event for the patient. ■ Creates new or updates existing patient’s record in IIS (i.e., submits or enters patient’s demographic-only information or historical-only immunization information for a patient). 	<ul style="list-style-type: none"> ■ Identification of an individual as a patient of a provider organization is done by assigning “active” status to the association between the individual and the provider organization. In other words, “active” status characterizes an association between a patient and a provider organization (i.e., identifies an individual as an “active” patient of that provider organization). ■ “Documented” information in this context means PAIS-related information from various sources (e.g., provider organization’s notes, records, or paper-based submissions, as well as information obtained by IIS through telephone calls, in-person conversations during site visits, billing data, health insurance notifications, etc.). Such information can be substituted for some Direct UI or EDE submissions. ■ Assignment of “active” status differs between the 1-1 and 1-M approaches. See BR402A and BR402B for specific rules for “active” status assignment at the provider organization level for the 1-1 and 1-M approaches. <ul style="list-style-type: none"> ■ Note that not all the factors included in this principle are used to determine “active” status in the 1-1 approach. For example, the following condition is not used in the 1-1 approach: <ul style="list-style-type: none"> ◆ Updates to an existing patient record in IIS (i.e., submission or entry of patient’s demographic-only information or historical-only immunization information to IIS). ■ If there is no direct or indirect identification of an individual as a patient by a provider organization, PAIS at the provider organization level may not be considered active. <ul style="list-style-type: none"> ■ Note that the initial status for a relationship between a patient and a provider organization is “unassigned” (see Fig. 2). ■ A possible situation for indirectly inferring patient status as “active” with a provider organization is when a patient has “active” status with another provider organization which is a subsidiary of that provider organization. This is an optional, IIS-specific, and case-specific condition. <ul style="list-style-type: none"> ■ Example: provider organizations A, B, and C are subsidiaries of provider organization D (in other words, provider organization D is a “parent” organization for provider organizations A, B, and C). If a patient has “active” status with provider organization A, she will be assigned “active” status with provider organization D, but not with provider organizations B or C. ■ Reference the 2013 MIROW DQA guide [1.1] for “parent” or “subsidiary” organizational hierarchy.

#	Principles	Remarks
P 3 0 7	<p>P307. Identification of an individual as NOT a patient of a provider organization for purposes of reminder-recall and assessment</p> <p>Identification of an individual as NOT a patient of a provider organization for purposes of reminder-recall and assessment may be done in any of the following ways:</p> <ul style="list-style-type: none"> ■ Direct: when at least one of the following is true: <ul style="list-style-type: none"> ■ A provider organization sets PAIS to “inactive” or “deceased” via Direct UI or EDE. ■ IIS obtains documented information by some other means (see remarks). ■ Indirect: patient status with the provider organization is implied by IIS based on any of the following documented factors: <ul style="list-style-type: none"> ■ Patient is deceased. ■ Relationship between a provider organization and a patient has been terminated by either party, for example: <ul style="list-style-type: none"> ◆ Patient has gone/transferred to another provider organization. ◆ Patient has moved out of the area. ■ Not acceptable provider type. ■ Not acceptable vaccination encounter type. ■ Patient has received a more recent immunization from another provider organization (only for 1-1). 	<ul style="list-style-type: none"> ■ Not a patient refers to an individual who is not included in reminder-recalls and coverage assessments. ■ “Documented” information in this context means PAIS-related information from various sources (e.g., provider organization’s notes, records, or paper-based submissions, as well as information obtained by IIS through telephone calls, in-person conversations during site visits, billing data, health insurance notifications, etc. Such information can be substituted for some Direct UI or EDE submissions. ■ Provider organization type: see the discussion of this term in Appendix A of this document. ■ IIS should actively monitor indirect information on patient’s status at the provider organization level and update status in a timely manner. ■ See BR404A, BR404B. ■ “Provider organization of an acceptable type” is shorthand for “Acceptable Provider Organization Type for Reminder-recalls or Assessments.” In other words, the provider organization type should be considered acceptable if it may conduct reminder-recall or assessment reports for a patient. <ul style="list-style-type: none"> ■ See item 5.2 in Appendix A (terms and definitions) for a discussion of this term. ■ “Vaccination encounter of an acceptable type”: each IIS should determine implementation specifics for acceptable vaccination encounter type. In general, patient status should not be set to “active” for a mass vaccination event. <ul style="list-style-type: none"> ■ See item 14.2 in Appendix A (terms and definitions) for a discussion of this term.

#	Principles	Remarks
P 3 0 8	<p>P308. Supremacy of PAIS explicit assignment</p> <p>Any explicit assignment of PAIS by a provider organization of an acceptable type should supersede</p> <ul style="list-style-type: none"> ■ Previous patient status with that provider organization, and ■ Patient status that can be indirectly implied by IIS based on the information available up to this moment 	<ul style="list-style-type: none"> ■ In other words, if a provider organization enters/submits an “active” or “inactive” status, it should supersede any previous status for a patient. <ul style="list-style-type: none"> ■ Provider organizations should not set patient status arbitrarily, but rather based on rules defined in this guide. Provider organizations should use appropriate criteria to assign patient status, such as deceased, moved out of area, gone to another provider, etc. (see business rules in Chapter 4 of this document). ■ A death date received by IIS from vital records supersedes a status set by a provider organization. IIS should communicate such information to the provider organization. ■ For 1-1 and 1-M approaches, if a provider organization directly sets patient status to “inactive,” the status should be considered as “inactive” regardless of any vaccination events the provider organization conducted for the patient. However, future vaccination events conducted by the provider organization for the patient may result in the patient status being changed to “active.” <ul style="list-style-type: none"> ■ If a provider organization submits information about a vaccination event that it conducted, and the submission has a patient status to “inactive,” the status should be considered “inactive.” ■ If a provider organization has not conducted any vaccination events for the patient, but sets patient status to “active,” the status should be considered “active.” ■ For the 1-1 approach, setting patient status to active by one provider may affect the patient status with other provider organizations <ul style="list-style-type: none"> ■ For example, if provider organization A gave the most recent vaccination, but provider organization B claims a patient by setting PAIS to “active,” PAIS should be considered “active” with provider organization B and “inactive” with provider organization A. In other words, in the 1-1 approach, provider organization that gave the last shot “wins”, i.e., most recent immunization trumps. It should be a rare occurrence when two providers vaccinate the same patient on the same day. ■ Note that sometimes a provider organization will submit a status for a patient they expect to see on an upcoming date, but who has not yet received vaccination services from that provider organization. ■ See operational scenario S801.
P 3 0 9	<p>P309. Same rules for public and private provider organizations</p> <p>Rules for status assignment should be the same for public and private provider organizations.</p>	

#	Principles	Remarks
P 3 1 0	<p>P310. "Out of state" patients</p> <p>Status should be maintained at the provider organization level for a patient that resides outside of the geographic jurisdiction served by the IIS, but is associated with a provider organization within that geographic jurisdiction.</p> <p>Status may never be "active" at the geographic jurisdiction level for a patient that resides outside of the geographic jurisdiction served by the IIS, but is associated with a provider organization within that geographic jurisdiction.</p>	<ul style="list-style-type: none"> ■ An out-of-geographic jurisdiction patient (i.e., highest level of a geographic jurisdiction, such as state or city) can have "active" status with a provider organization in that jurisdiction, but will be always "inactive" with the geographic jurisdiction. ■ "Out of state" provider organizations: if a patient resides within the IIS' top jurisdiction (state or city) and is seeing a provider organization outside the jurisdiction, the patient would be "active" for the geographic jurisdiction and have no status with the out-of-state provider organization. ■ See operational scenarios S101, S102, S103, S401 in Chapter 6 of this guide.
P 3 1 1	<p>P311. PAIS should be maintained for patients of all ages</p> <p>PAIS should be maintained for patients of all ages.</p>	
P 3 1 2	<p>P312. Any submission should include PAIS</p> <p>PAIS should be included in any submission from a provider organization to the IIS.</p>	<ul style="list-style-type: none"> ■ Implementation of this principle may require upgrade of current EHR systems' capabilities.
P 3 1 3	<p>P313. Opt-out from IIS</p> <p>Opting out of IIS should not impact PAIS. Rather, it should be handled as an additional consideration (filter) for selecting a cohort for reminder-recalls and coverage assessments.</p>	<ul style="list-style-type: none"> ■ Opting out of IIS should be managed via a mechanism different from PAIS, one that uses a dedicated variable (data element) to track individuals who opted out. ■ Laws and policies regarding opt-outs and limitations in sharing data vary significantly across registries. Accordingly, there are many different ways in which registries must handle opt-outs and limitations in sharing data, for example: <ul style="list-style-type: none"> ■ Some are required to purge any information once someone opts out. ■ Some allow only name and certain minimal demographic information to be stored (so it can be matched if subsequent information is received). ■ Some still report all of the patient's immunizations, but don't allow provider organizations to access them. ■ Some do not create a record for the individual at all. ■ Some allow only the IIS to have access to the information, but it is hidden from all others. ■ Based on local opt-out laws or policies, individuals who have opted out may be included in geographic jurisdiction assessments and reminder-recalls. ■ AFIX policies exclude individuals who have opted out of the IIS from assessments. ■ Adoption is very similar to opt-out. Each IIS will be required to address adoption in accordance with varying state laws and policies and the mechanism should (but may not be) separate from the patient status mechanism. Implementation consideration: some states may use <u>"expanded" patient status concept</u> to deal with adoptions.

#	Principles	Remarks
P 3 1 4	<p>P314. Opt-out from reminder-recall</p> <p>Opting out of reminder-recall notifications should not impact PAIS. Rather, it should be handled as an additional consideration (filter) for selecting a cohort for reminder-recalls.</p>	<ul style="list-style-type: none"> ■ Opting out of reminder-recall notifications should be managed via a mechanism different from PAIS, one that uses a dedicated variable (data element) to track individuals who opted out. In general, no reminder-recall notifications should be sent to an individual who opted out of reminder-recall notifications, subject to local policies and laws. <ul style="list-style-type: none"> ■ Some IIS do allow reminder-recalls to be sent to individuals who opted out of reminder-recall notifications (e.g., in case of a disease outbreak). ■ Some IIS do not allow individuals to opt out of reminder-recall notifications. ■ Based on local opt-out laws or policies, individuals who have opted out may be included in reminder-recalls. ■ AFIX policies include patients who have opted out of reminder-recall in assessments.

Chapter 4: PAIS Management

Nomenclature of statuses

According to considerations presented in Chapter 3, “PAIS Fundamentals”, patient/individual statuses are defined at two levels — provider organization level and geographic jurisdiction level. Since a geographic jurisdiction can contain another geographic jurisdiction, these definitions cover a hierarchical structure of statuses at provider organization-city-county-state levels. (For a visual description of this concept, see [domain diagrams](#) in [Appendix A](#). The domain model is a key tool to understanding the multiple relationships in assessing patient status in IIS.)

Patient statuses at the provider organization level are:

- Active
- Inactive, with the following reason codes:
 - No longer a patient
 - Lost to follow-up
 - Unspecified
- Deceased

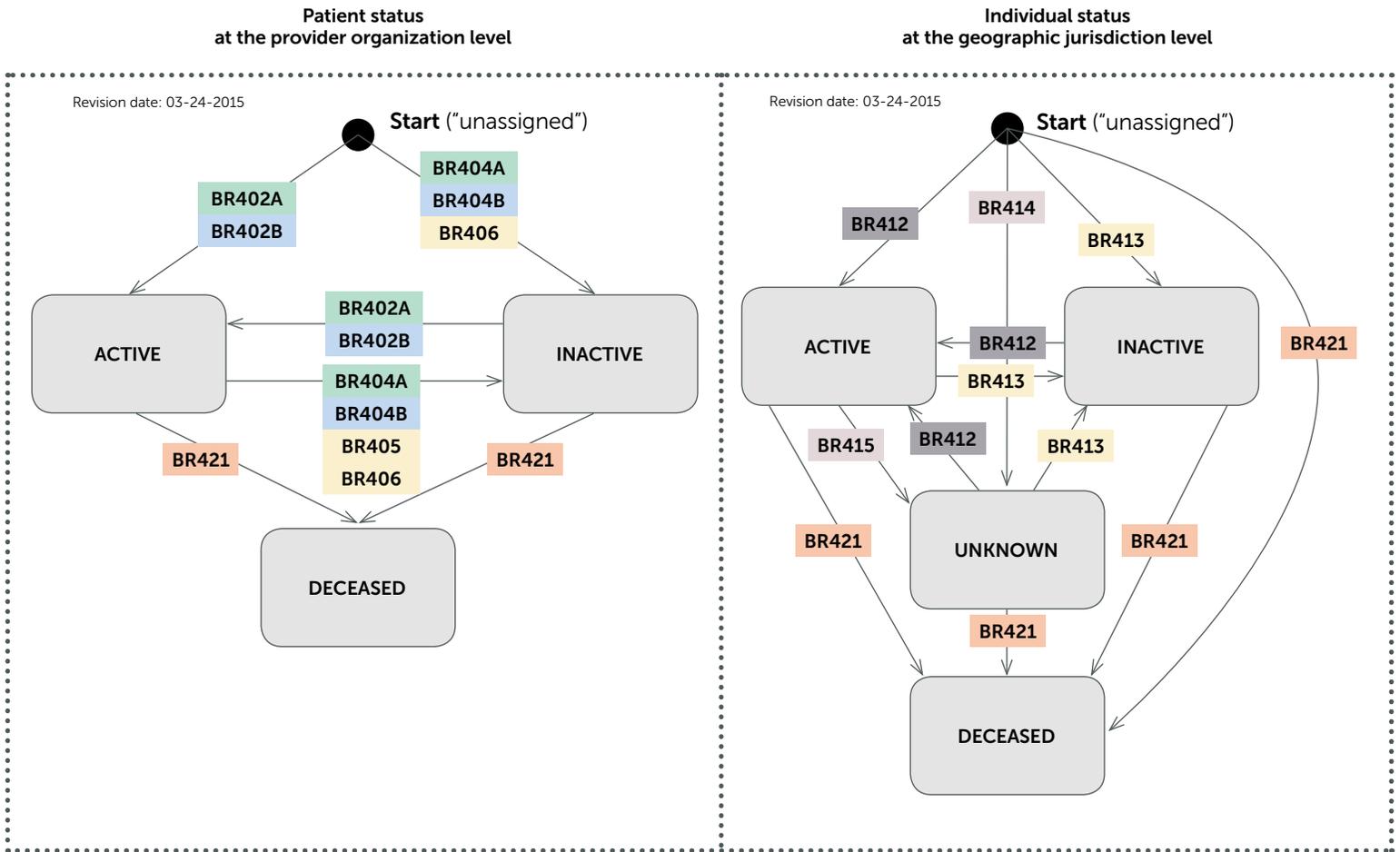
Statuses for an individual at the geographic jurisdiction level are:

- Active
- Inactive, with the following reason codes:
 - Outside jurisdiction
- Unknown, with the following reason codes:
 - No address - no vaccination
 - No activity for extended period of time
- Deceased

Descriptions of these statuses and conditions for transitioning from one status to another are presented with business rules in [Table 3](#) and are shown in diagrams in [Fig. 2](#).

Implementation consideration: reason codes can be handled as sub-statuses of the “inactive” status (i.e., at the provider organization level, inactive-no longer a patient, inactive-lost to follow-up, inactive-unspecified).

Patient status diagrams



Note: The initial status for a relationship between patients and provider organizations (individuals and geographic jurisdictions) is "unassigned", meaning that no relationship (with respect to reminder-recall and assessment) between a patient/individual and a provider organization/geographic jurisdiction exists.

Figure 2. Patient active/inactive status diagrams

- PAIS at the provider organization level (on the left)
- PAIS at the geographic jurisdiction level (on the right)

How to use and interpret patient status diagrams

The diagrams in Fig. 2 above represent the decision-making process that the MIROW panel of experts recommends provider organizations and IIS use to determine a client's status. The rectangles, or "nodes," in the diagrams represent the different types of status that might be assigned to a client as described in [Table 3](#). The arrows between the nodes represent the patient's transition from one status to another. These arrows are associated with the "business rules" used to move a patient from one status to another. While they may at first appear somewhat complicated, the diagrams actually help to clarify the processes described in the text and tables. These diagrams graphically represent the decision-making process used to change patient status at each level (provider organization or jurisdiction) that is concerned with classifying patient status relative to an operational process (i.e., assessment or reminder-recall).

When interpreting the diagrams, it is often useful to talk your way through each one. For example, when interpreting the diagram "Patient status at the provider organization level" at left, begin at the starting point at the top and move down the left-hand side: if Provider A sends demographic and immunization information for an individual to the IIS and identifies that individual as a patient, then business rule [BR402A](#) or [BR402B](#) would be

applied, and the status would be set to "active" with Provider A. If contact with the patient is subsequently lost and documented attempts have been made to locate/contact the patient with no response, then business rule [BR405](#) would be applied, and the patient may be moved from "active" status with Provider A to "inactive" status, with the reason code "lost to follow-up." However, if the IIS can determine that the patient in question is receiving immunizations elsewhere ([BR404A](#), 1-1 approach), then the patient status may be changed to "inactive" with Provider A, with the reason code "no longer a patient."

Public health professionals who work with IIS may test the diagram for themselves by outlining a common situation they face when assigning a status to a client, then following the "flow" through the diagram to see how and when the business rules will manage that decision-making process and what result they will produce. Such typical and challenging operational scenarios based on diagrams ([Fig. 2](#)) and business rules ([Table 3](#)) are illustrated in [Chapter 6](#) of this document.

Assigning a status to a patient should, therefore, be the result of systematically employing the business rules ([Table 3](#)) that govern an individual's relationship with a provider organization and geographic jurisdiction.

Business rules

Business rules (BR) represent specific requirements and decision-making logic for IIS processes and operations. Specific recommendations are presented in [Table 3](#), where business rules are shown in the following order:

- [BR401](#). Nomenclature of statuses at the provider organization level
- [BR402A](#). Active status at the provider organization level: 1-1
- [BR402B](#). Active status at the provider organization level: 1-M
- [BR404A](#). Inactive status at the provider organization level with the reason code "No longer a patient": 1-1
- [BR404B](#). Inactive status at the provider organization level with the reason code "No longer a patient": 1-M
- [BR405](#). Inactive status at the provider organization level with the reason code "Lost to follow-up"
- [BR406](#). Inactive status at the provider organization level with the reason code "Unspecified"
- [BR411](#). Nomenclature of statuses at the geographic jurisdiction level
- [BR412](#). Active status at the geographic jurisdiction level
- [BR413](#). Inactive status at the geographic jurisdiction level with the reason code "Outside jurisdiction"
- [BR414](#). Unknown status at the geographic jurisdiction level with the reason code "No address - no vaccination"
- [BR415](#). Unknown status at the geographic jurisdiction level with the reason code "No activity for extended period of time"
- [BR421](#). Deceased status at the provider organization and geographic jurisdiction levels

Table 3. Business rules for patient active/inactive status (PAIS).

#	Business Rules	Remarks
Provider organization level		
BR401	<p>Nomenclature of statuses at the provider organization level</p> <p>Patient status at the provider organization level may only have one of the following designations:</p> <ul style="list-style-type: none"> ■ Active ■ Inactive, with one of the following reason codes: <ul style="list-style-type: none"> ■ No longer a patient ■ Lost to follow-up ■ Unspecified ■ Deceased 	<ul style="list-style-type: none"> ■ Implementation consideration: reason codes can be handled as sub-statuses of the “inactive” status (i.e., inactive-no longer a patient, inactive-not acceptable provider type, inactive-lost to follow-up, inactive-unspecified). Also see Chapter 7 in this guide for HL7-related implementation considerations. ■ Patient active/inactive status characterizes the association between one patient and one provider organization (see principle P301). ■ The initial status for a relationship (with respect to reminder-recall and assessment) between a patient and a provider organization is “unassigned” (see Fig. 2), meaning that no relationship (with respect to reminder-recall and assessment) between a patient and a provider organization exists.

#	Business Rules	Remarks
BR402A	<p>BR402A. Active status at the provider organization level: 1-1</p> <p>For the 1-1 approach, patient status with a provider organization should be considered “active” only if the provider organization is of an acceptable type and any of the following is true:</p> <ul style="list-style-type: none"> ■ Provider organization directly identifies the individual as a patient. ■ Provider organization indirectly identifies the individual as a patient: <ul style="list-style-type: none"> ■ Provider organization has conducted the most recent vaccination event during the vaccination encounter of an acceptable type for the patient. <p>Provider organization has created new patient’s record in IIS (i.e., submitted or entered patient’s demographic-only information or historical-only immunization information for a patient not already in IIS).</p>	<ul style="list-style-type: none"> ■ For 1-1 approach, a patient may have “active” status with only one provider organization at a time. See section “Description of 1-1 and 1-M approaches” in Chapter 3 of this document. ■ See P306 for key factors to consider when determining a patient’s “active” status at the provider organization level. <ul style="list-style-type: none"> ■ Note that not all key factors included in P306 are used to determine “active” status in the 1-1 approach. The following condition in P306 is not used in the 1-1 approach: <ul style="list-style-type: none"> ◆ Updates to an existing patient’s record in IIS (i.e., submission or entry of a patient’s demographic-only information or historical-only immunization information to IIS). ■ “Provider organization of an acceptable type” is shorthand for “Acceptable Provider Organization Type for Reminder-recalls or Assessments.” In other words, the provider organization type should be considered acceptable if it may conduct reminder-recall or assessment reports for a patient. <ul style="list-style-type: none"> ■ Which provider organization types are acceptable vary by IIS, given varying needs and approaches to reminder-recalls and assessments. ■ See item 5.2 in Appendix A (terms and definitions). ■ See the discussion of this term in Appendix A of this document. ■ Note that acceptable provider organization type may vary according to the age of the patient. ■ “Provider organization directly identified individual as a patient”: See principle P306. ■ “Vaccination encounter of an acceptable type”: each IIS should decide implementation specifics by defining acceptable vaccination encounter type. In general, patient status should not be set to “active” for a mass vaccination event. <ul style="list-style-type: none"> ■ See item 14.2 in Appendix A (terms and definitions). ■ See the discussion of this term in Appendix A of this document. ■ See P308 “Supremacy of direct identification” above. ■ Vaccine type should not impact PAIS determination. ■ Patient status with a provider organization should be set to “inactive” when PAIS for this patient is set to “active” with another provider organization. ■ PAIS should remain active when a provider organization conducts a vaccination event for a patient who already has “active” status with that provider organization. ■ See operational scenarios S301, S501, S601, S701, S704, and S801, as well as S101, S504, S703.

#	Business Rules	Remarks
BR402B	<p>BR402B. Active status at the provider organization level: 1-M</p> <p>For the 1-M approach, patient status with a provider organization should be considered “active” only if the provider organization is of an acceptable type and any of the following is true:</p> <ul style="list-style-type: none"> ■ Provider organization directly identifies the individual as a patient. ■ Provider organization indirectly identifies individual as a patient in any of the following ways: <ul style="list-style-type: none"> ■ Provider organization conducted a vaccination event during a vaccination encounter of an acceptable type for the patient. ■ Provider organization has created new or updated an existing patient’s record in IIS (i.e., submitted or entered patient’s demographic-only information or historical-only immunization information for a patient) 	<ul style="list-style-type: none"> ■ For 1-M approach, a patient may have “active” status with more than one provider organization at a time. Reference section “Description of 1-1 and 1-M approaches” in the Chapter 3 of this document. ■ See P306 for key factors that should be considered to determine “active” patient status at the provider organization level. ■ “Provider organization of an acceptable type”: shorthand for “Acceptable Provider Organization Type for Reminder-recalls or Assessments”. In other words, the provider organization type should be considered acceptable if it may conduct reminder-recall or assessment reports for a patient. <ul style="list-style-type: none"> ■ Which provider organization types are acceptable vary by IIS given varying needs and approaches to reminder-recalls and assessments ■ See item 5.2 in Appendix A (terms and definitions) ■ See the discussion of this term in Appendix A of this document. ■ Note that acceptable provider organization type may vary according to the age of the patient. ■ “Vaccination encounter of an acceptable type”: each IIS should decide on implementation specifics by defining acceptable vaccination encounter type. In general, patient status should not be set to “active” for a mass vaccination event. <ul style="list-style-type: none"> ■ See item 14.2 in Appendix A (terms and definitions). ■ See the discussion of this term in Appendix A of this document. ■ See P308 “Supremacy of direct identification.” ■ Vaccine type should not impact PAIS determination. ■ PAIS should remain active when a provider organization conducts a vaccination event for a patient who already has “active” status with that provider organization. ■ See P306 for indirectly inferring patient status as “active” when a patient has “active” status with a subsidiary provider organization. This is an optional, IIS-specific and case-specific condition. ■ See operational scenarios S302, S502, S602, S702, and S705, as well as S101, S504, and S703.

#	Business Rules	Remarks
BR404A	<p>BR404A. Inactive status at the provider organization level with the reason code “No longer a patient”: 1-1</p> <p>For the 1-1 approach, patient status at the provider organization level should be considered “inactive” with the reason code “No longer a patient” only if any of the following is true:</p> <ul style="list-style-type: none"> ■ Relationship between a provider organization and a patient has been terminated by either party, for example: <ul style="list-style-type: none"> ■ Patient has gone/transferred to another provider organization ■ Patient has moved out of the area ■ Patient has received a more recent immunization from another provider organization 	<ul style="list-style-type: none"> ■ There may be overlap in the criteria elements (i.e. criteria elements are not mutually exclusive). ■ In essence, “No longer a patient” describes a situation when it is apparent that the patient will no longer see this provider, or is going to see another provider or is moving out of the area. Examples include notations in a patient’s chart that the patient is moving, or a record release indicates that the patient is seeing a different provider. These conditions might be noted/ documented by the provider organization or inferred by IIS. ■ The condition “Moved out of area” should be locally defined. <ul style="list-style-type: none"> ■ There are cases when a patient has moved, but still receives immunizations from the provider organization. In some areas, it is not unusual for a patient to continue receiving services from a provider organization that is 100 miles away. Therefore, criteria should be established by each IIS based on local circumstances to define when a patient’s move should result in inactive status with the provider organizations. The key factor should be that a provider organization does not recognize an individual as a patient. ■ Provider organization may choose to code patients who have not been seen in an extended period of time as “Inactive - No longer a patient”. ■ See P306, P307, P308. ■ See operational scenarios S102, S301, S501, S601, and S801, as well as S201.
BR404B	<p>BR404B. Inactive status at the provider organization level with the reason code “No longer a patient”: 1-M</p> <p>For the 1-M approach, patient status at the provider organization level should be considered “inactive” with the reason code “No longer a patient” only if any of the following is true:</p> <ul style="list-style-type: none"> ■ Relationship between a provider organization and a patient has been terminated by either party, for example: <ul style="list-style-type: none"> ■ Patient has gone/transferred to another provider organization ■ Patient has moved out of the area 	<ul style="list-style-type: none"> ■ In essence, “No longer a patient” describes a situation when it is apparent that the patient will no longer see this provider, will be seeing another provider, or has moved out of the area. Examples include notations in a patient’s chart that the patient is moving, or a record release indicating that the patient is seeing another provider. ■ Conditions might be noted/documentated by the provider organization or inferred by IIS. ■ Moved out of area should be locally defined. <ul style="list-style-type: none"> ■ There are cases when a patient has moved, but still receives immunizations from the provider organization. In some areas, it is not unusual for a patient to continue receiving services from a provider organization that is 100 miles away. Therefore, criteria should be established by each IIS based on local circumstances to define when a patient’s move should result in inactive status with the provider organization should be established by each IIS based on local circumstances. The key factor should be that a provider organization does not recognize an individual as a patient. ■ Provider organization may choose to code patients who have not been seen in an extended period of time as “Inactive - No longer a patient”. ■ See P306, P307, P308. ■ See operational scenarios S102 and S201.

#	Business Rules	Remarks
BR405	<p>BR405. Inactive status at the provider organization level with the reason code "Lost to follow-up"</p> <p>Patient status at the provider organization level should be considered "inactive" with the reason code "Lost to follow-up" only if any of the following is true:</p> <ul style="list-style-type: none"> ■ Attempts to contact individual have been documented but no documented response has been received ■ Provider organization has no means to contact patient, e.g. no address, no cell phone 	<ul style="list-style-type: none"> ■ In the absence of any state guideline, after 90 days and a minimum of three (3) unsuccessful attempts to contact a patient, PAIS should be set to "inactive" at the provider level (with the reason code "Lost to follow-up") and remain "active" at the geographic jurisdiction level. ■ This is an update to BR802 from the 2009 MIROW RR guide [1.4], p. 50. ■ Also see principle P803 in the 2009 MIROW RR guide [1.4], p. 49. ■ Consider following the escalation principle P802 from the MIROW RR guide [1.4], p. 49, to increase likelihood of successful contact: ■ "After an unsuccessful RR attempt, if the RR process is not ended, consider a different RR Notification method. For example, escalation from a postcard to a telephone call." ■ A locator service may also be used to attempt to update a patient's contact information for outreach.
BR406	<p>BR406. Inactive status at the provider organization level with the reason code "Unspecified"</p> <p>Patient status at the provider organization level should be considered "inactive" with the reason code "Unspecified" only if patient's information has been submitted to an IIS via an electronic interface (EDE) with the inactive status without a reason code being specified.</p>	<p>Should only be used by provider organizations which are technically not able to specify a reason, (e.g., EHR system is in transition).</p> <ul style="list-style-type: none"> ■ Provider organizations should not set the inactive "unspecified" status arbitrarily, but rather, based on rules defined in this guide. The provider organization should still use appropriate criteria to assign inactive "unspecified" status (i.e., criteria for inactive "No longer a patient" [BR404A and BR404B] and inactive "Lost to follow-up" [BR405]). ■ Implementation consideration: Some systems may not provide a reason, using an empty reason or null value instead.

Geographic Jurisdiction level

BR411	<p>BR411. Nomenclature of statuses at the geographic jurisdiction level</p> <p>Individual status at the geographic jurisdiction level may only have one of the following designations:</p> <ul style="list-style-type: none"> ■ Active ■ Inactive, with the following reason code: <ul style="list-style-type: none"> ■ Outside jurisdiction ■ Unknown, with the following reason codes: <ul style="list-style-type: none"> ■ No address - no vaccination ■ No activity for extended period of time ■ Deceased 	<ul style="list-style-type: none"> ■ Implementation consideration: the majority of IIS currently do not have an actual field called "Geographic jurisdiction PAIS"; however, many IIS derive this status from other data, primarily residence address. Having a separate field (data element) for PAIS at the geographic jurisdiction level would represent a more solid implementation approach (e.g., it could provide traceability and history of status changes). See also Chapter 7 in this guide. ■ The initial status for a relationship (with respect to reminder-recall and assessment) between an individual and a geographic jurisdiction is "unassigned" (see Fig. 2), meaning that no relationship (with respect to reminder-recall and assessment) between an individual and a geographic jurisdiction exists.
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#	Business Rules	Remarks
B R 4 1 2	<p>BR412. Active status at the geographic jurisdiction level</p> <p>Individual status with a geographic jurisdiction should be considered “active” only if any of the following is true:</p> <ul style="list-style-type: none"> ■ Individual residence within the geographic jurisdiction has been confirmed. ■ Individual received an immunization from a provider organization within the geographic jurisdiction and individual’s address is not known (<i>this condition applies only to highest level geographic jurisdiction, such as state or city</i>). 	<ul style="list-style-type: none"> ■ Status should not be set to “active” at the geographic jurisdiction level for an individual who received an immunization from a provider organization within the geographic jurisdiction and has the address outside of that jurisdiction. See BR413. ■ See operational scenario S103, S504, S505, as well as S401, S703, and S706.
B R 4 1 3	<p>BR413. Inactive status at the geographic jurisdiction level with the reason code “Outside jurisdiction”</p> <p>Individual status at the geographic jurisdiction level should be considered “inactive” with the reason code “Outside jurisdiction” only if the individual does not reside in the geographic jurisdiction.</p>	<ul style="list-style-type: none"> ■ Illustrative scenarios include: <ul style="list-style-type: none"> ■ Individual once had a valid address in the jurisdiction, but now has a known address outside the jurisdiction. ■ Individual has a known residence outside the highest level geographic jurisdiction (such as state) but receives healthcare within the state. <ul style="list-style-type: none"> ◆ In this specific example (not all cases of this scenario), the patient will be active with at least one provider organization at the provider organization level. ■ Change of address received in a submission from a provider organization may include a partial address, such as when only the patient’s state of residence is known (in which case the individual status is “Inactive—Outside Jurisdiction”), and if there is an “address unknown” flag (in which case it cannot be concluded that patient has moved outside of the geographic jurisdiction and the status remains “active” at the geographic jurisdiction level). ■ There can be more than one geographical jurisdiction level of hierarchy. For example, in some cases a state/city IIS (highest level of a geographic jurisdiction) maintains statuses for individuals associated with local health departments (lower level of a geographic jurisdiction). See P302. ■ See operational scenario S101, S102.
B R 4 1 4	<p>BR414. Unknown status at the geographic jurisdiction level with the reason code “No address - no vaccination”</p> <p>Individual status at the geographic jurisdiction level should be considered “unknown” with the reason code “No address – no vaccination” only if the IIS has never received an address and has never received vaccination information about the individual.</p>	<ul style="list-style-type: none"> ■ For example, <ul style="list-style-type: none"> ■ Demographic data received with no address. ■ Birth record where child is up for adoption and no birth dose. ■ Patient may be homeless (and has not received an immunization). ■ Other types of contact information (e.g., e-mail address) might be available which can be used to attempt contact. IIS should consider using other sources (e.g., Health Information Exchange) to find an individual’s contact information. ■ IIS should use reliable data sources and must be careful about what sources they authorize to provide data (i.e., IIS should avoid situations in which they have no address and no immunization). ■ Note that this business rule applies to incoming data. An IIS may have existing data that was not coded according to BR414. ■ See Table 7, Assessment report at the geographic jurisdiction level. ■ See operational scenarios S701, S702.

#	Business Rules	Remarks
BR415	<p>BR415. Unknown status at the geographic jurisdiction level with the reason code "No activity for extended period of time"</p> <p>Individual status at the geographic jurisdiction level should be considered "unknown" with the reason code "No activity for extended period of time" only if the IIS has not received demographic and/or immunization information for an individual for an extended period of time.</p>	<ul style="list-style-type: none"> ■ The MIROW panel of experts had extensive discussions about defining "extended period of time" and was not able to provide a specific (numeric) recommendation. ■ Each IIS should 1) document its practices and the specific (numeric) period of time used to determine "Unknown" status at the geographic jurisdiction level with the reason code "No activity for extended period of time", and 2) share the documented practices with AIRA to ensure transparency, and to inform a future recommendation for a specific (numeric) period of time. ■ Some IIS currently require 7 years of inactivity to classify someone as "unknown." Other IIS never assign "inactive" status due to lack of activity at the jurisdictional level. ■ See Table 7, Assessment report at the geographic jurisdiction level. ■ Note that the "extended time period" could be different for different age cohorts. For example, adults might not be eligible for anything other than flu vaccination for an extended period of time.

Both Provider Organization and Geographic Jurisdiction levels

BR421	<p>BR421. Deceased status at the provider organization and geographic jurisdiction levels</p> <p>Patient status at the provider organization and geographic jurisdiction levels should be considered "inactive" with the reason code "Deceased" only if a patient's death is confirmed.</p>	<ul style="list-style-type: none"> ■ For a deceased patient, PAIS should be changed to "deceased" at both the provider organization level and the geographic jurisdiction level. <ul style="list-style-type: none"> ■ PAIS at both levels – geographic jurisdiction and provider organization – should be coordinated (i.e., if status is set to "deceased" at the geographic jurisdiction level, it should also be set to "deceased" at the provider organization level for all provider organizations associated with the patient, and vice versa. ■ Examples of confirmation include a family member informing the IIS or provider organization, or a notification from Vital Records. ■ See Chapter 7, Death Indicator section.
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Implementation note

IIS might consider capturing all significant events related to the relationship between a patient and a provider organization, including events that do not result in assignment of "active" status. For example:

- Vaccination event has been conducted by a provider organization of NOT acceptable provider organization type.
- Vaccination event has been conducted during a vaccination encounter of NOT acceptable vaccination encounter type.

Reference the section [Operational-level analysis requirements vs. implementation-level design solutions](#) for various implementation approaches that IIS can use to store and manage this information.

Chapter 5: Using PAIS for Reminder-Recall and Assessment Reports

This chapter provides recommendations on using patient statuses, defined in Chapter 4, when selecting a cohort for reminder-recall notifications and assessment reports. Note that a variety of factors other than patient status affect selection of a patient cohort. For example, depending on the assessment report or reminder-recall purpose, a cohort may be composed of patients of a certain age range, residence location, and/or specific types of vaccine. The recommendations presented here focus only on the impact of patient active/inactive status on the population cohort selection.

Note that statuses at the provider organization level and geographic jurisdiction level are defined by different business rules. For example, a provider organization may indicate a patient as “Inactive - Lost to Follow-up,” but a geographical jurisdiction cannot use “Lost to Follow-up” as a reason for assigning “inactive” status.

Rules for including patients/individuals in reminder-recall notifications and assessment reports are documented in the following decision tables:

- **Table 4.** Reminder-recall notification at the provider organization level.
- **Table 5.** Reminder-recall notification at the geographic jurisdiction level.
- **Table 6.** Assessment report at the provider organization level.
- **Table 7.** Assessment report at the geographic jurisdiction level.

The top half of each table reflects the conditions used to determine whether a patient/individual is included in the process. The bottom half reflects the recommended actions. Each column represents a scenario indicating what the resulting action should be for specific conditions. For example, in Table 4, Scenario A, if a patient has “active” status, he/she should be included in the reminder-recall notification. In Scenario B, if a patient has “inactive” status, he/she should be excluded from the reminder-recall notification.

Reminder-Recall at the Provider Organization Level

Table 4. Reminder-recall (RR) notification at the provider organization level.

Conditions	Scenario A	Scenario B
Patient status at the provider organization level	Active	Inactive Deceased
Actions		
1. Include in provider organization RR notification ⁽¹⁾	X	
2. Exclude from provider organization RR notification		X

Notes:

- (1) For considerations regarding patients that have opted out, refer to principles [P313](#), “Opt-out from IIS,” and [P314](#), “Opt-out from reminder-recall.” In general, reminder-recall notifications should not be sent to a patient who has opted out of reminder-recall notifications (subject to local policies and laws).
- (2) “Inactive” applies to all inactive reason codes: “No longer a patient”, “Lost to follow-up”, and “Unspecified”.
- (3) Patients (individuals) with the “unassigned” (initial) status should not be included in the assessments and reminder-recalls. See [Fig. 2](#) and remarks for [BR401](#) and [BR411](#).

Reminder-Recall at the Geographic Jurisdiction Level

Table 5. Reminder-recall (RR) notification at the geographic jurisdiction level.

Conditions	Scenario A	Scenario B	Scenario C
Individual status at the geographical jurisdiction level	Active	Inactive Deceased	Unknown
Actions			
1. Include in geographical jurisdiction RR notification ⁽¹⁾	X		
2. Exclude from geographical jurisdiction RR notification		X	
3. IIS makes determination whether to include ^{(2),(3)}			X

Notes:

- (1) For considerations regarding individuals who have opted out, refer to principles [P313](#), “Opt-out from IIS,” and [P314](#), “Opt-out from reminder-recall.” In general, reminder-recall notifications should not be sent to an individual who opted out of reminder-recall notifications (subject to local policies and laws).
- (2) When other methods of contact not based on the individual’s address are available (e.g., e-mail), the IIS may choose to include such an individual in the cohort and send a reminder-recall notification using the available contact method.
- (3) An IIS may continue trying to contact individuals with unknown patient status at the geographic jurisdiction level (reason codes “No activity for extended period of time” and “No address - no vaccination” – when other methods of contact are available, see note (2) above) by including such individuals in reminder-recall notifications at the geographic jurisdiction level.
- (4) “Unknown” applies to both unknown reasons: “No address – no vaccination” and “No activity for extended period of time.”
- (5) Patients (individuals) with the “unassigned” (initial) status should not be included in the assessments and reminder-recalls. See [Fig. 2](#) and remarks for [BR401](#) and [BR411](#).

Assessment Report at the Provider Organization level

There are a great variety of provider organization level assessments conducted based on IIS data. Consensus-based best practice recommendations for selecting a population cohort for a generic assessment report at the provider organization level are presented in [Table 6](#). These recommendations for a generic assessment report are based on AFIX considerations: they replicate the decision logic presented in [Table 4](#) for reminder-recall notifications at the provider organization level, reflecting a guiding recommendation of the AFIX-IIS panel of experts.

In order to satisfy needs of local immunization programs, an IIS may choose to modify the recommended decision logic to run various types of additional assessment reports at the provider organization level. However, each IIS should have functionality available to support best practice recommendations presented in [Table 6](#).

Table 6. Assessment report at the provider organization level.

Conditions	Scenario A	Scenario B
Patient status at the provider organization level	Active	Inactive Deceased
Actions		
1. Include in provider organization assessment report ⁽¹⁾	X	
2. Exclude from provider organization assessment report		X

Notes:

- (1) For considerations regarding patients who have opted out, refer to principles [P313](#), “Opt-out from IIS,” and [P314](#), “Opt-out from reminder-recall.”
- (2) “Inactive” applies to all inactive reason codes: “No longer a patient,” “Lost to follow-up,” and “Unspecified.”
- (3) Patients (individuals) with the “unassigned” (initial) status should not be included in the assessments and reminder-recalls. See [Fig. 2](#) and remarks for [BR401](#) and [BR411](#).
- (4) Keeping patient status history, including dates of changes and reason/entity making the change, would be helpful for assessments that are done retrospectively.

Discussion of the Assessment Report at the provider organization level

“Active” status is a key factor for a patient’s inclusion in the assessment report. There are some differences between definitions of “active” patient status in 1-1 and 1-M approaches (see [BR402A](#) and [BR402B](#)). Also, in accordance with the section “[1-1 and 1-M approaches](#)” in Chapter 3, when the 1-1 approach is used, a patient may be included in assessment reports for only one provider organization at a point in time, and when the 1-M approach is used, a patient may be included in assessment reports for many provider organizations at a point in time. A certain statistical challenge may appear when comparing assessment report data between the IIS where 1-1 approach is used and another IIS where 1-M approach is used. Note that for purposes of the AFIX program, comparison of provider organizations within an IIS (when a single consistent approach [1-1 or 1-M] is used) is a main focus. Special investigation methods should be used if the need to compare provider

organizations across IIS arises, as there are many other factors beyond this that impact the ability to compare data across IIS.

Hypothetically, for the 1-M approach, a single “principal” provider organization responsible for a patient might be selected among many provider organizations by using exact rules from 1-1 approach for assigning responsibility for the patient’s immunizations to a single provider organization. In other words, 1-1 approach provides a method to select one out of many provider organizations. Use of such a single “principal” provider organization for assessment report purposes in an IIS with the 1-M approach could contribute to comparability of assessment results obtained from an IIS using different(i.e., 1-1 and 1-M) approaches. See also Appendix A, section [Principal Provider Organization – Immunization Home](#).

Implementation considerations for pre-assessment review

This section was developed with input from the AFIX-IIS panel of experts in an effort to align materials in this document with recommendations in the “AFIX-IIS Integration Operational and Technical Guidance for Implementing IIS-Based Coverage Assessment – Phase 1”.

Pre-assessment activities should include creation of a list of patients who can be related to a provider organization, followed by a review and verification of each “candidate” patient for inclusion/exclusion in the assessment. It is possible to support identification and management of such “candidate” patients through the functionality known in some IIS implementations as “association”. Immunization programs may use various ways to develop a list of patients considered for inclusion in the provider organization’s “bucket” for the pre-assessment review. Some immunization programs may choose implementing the “association” functionality in an “all-inclusive” manner with selection of all patients that

might be considered as “candidates” for inclusion into the assessment report for a provider organization; other immunization programs may choose to use a more restrictive approach by including into the pre-assessment review only patients with the “Active” status. A provider organization may take time during the pre-assessment activities to review every “candidate” patient identified via the “association” functionality and modify patient status for some of the “candidate” patients; immunization programs may assist in this effort as time allows. Actual inclusion or exclusion of “candidate” patients in the provider organization’s assessment report depends on a resulting patient status for each individual. Support for creating and managing a list of “candidate” patients for the pre-assessment review can be achieved with a variety of implementation approaches using predetermined or ad-hoc queries, depending on specific policies and established practices of immunization programs.

Assessment Report at the Geographic Jurisdiction level

Table 7. Assessment report at the geographic jurisdiction level.

Conditions	Scenario A	Scenario B
Patient Geographic Jurisdiction Status	Active Unknown	Inactive Deceased
Actions		
1. Include in Geographic Jurisdiction Assessment ^{(1),(2)}	X	
2. Exclude from Geographic Jurisdiction Assessment		X

Notes:

- (1) Based on local opt-out laws or policies, an IIS may also choose to include individuals who have opted out in the assessment cohort. For considerations regarding opted-out patients, refer to principle [P313](#), “Opt-out from IIS.”
- (2) Individuals with unknown status at the geographic jurisdiction level (reason codes “No activity for extended period of time” and “No address - no vaccination”) might reflect two sub-populations of individuals: 1) individuals who reside in the jurisdiction who have not received vaccinations for a long time or 2) individuals who no longer reside in the jurisdiction, but have not been identified as non-residents. Ideally, IIS should include individuals in the first category in jurisdictional-level coverage assessments to ensure that assessments include the full population, and exclude individuals in the second category. However, IIS can be limited in their ability to distinguish between these sub-populations. Therefore, it is recommended to include individuals with unknown status in jurisdictional-level coverage assessments to ensure the full capture of the geographic jurisdiction’s population. Note that IIS can employ other methods to reduce the impact of biases resulting from the inadvertent inclusion of non-residents in the assessment. For example, IIS can use other reference sources such as census data for producing denominators for jurisdictional coverage assessments, or perform statistical adjustments to IIS data to produce more accurate estimates of population denominators.

In some cases, based on the assessment’s purpose, an IIS may decide that it is inappropriate to include individuals with unknown status at the geographic jurisdiction level in the vaccination coverage assessment. If unknowns are excluded from a geographic jurisdiction assessment, this should be clearly documented with the results.

- (3) “Unknown” applies to both unknown reason codes: “No address – no vaccination” and “No activity for extended period of time.”
- (4) Patients (individuals) with the “unassigned” (initial) status should not be included in the assessments and reminder-recalls. See [Fig. 2](#) and remarks for [BR401](#) and [BR411](#).

Be aware that use of the unknown status in [Table 7](#) for the assessment report at the geographic jurisdiction level is different from [Table 5](#) for reminder-recalls at the geographic jurisdiction level due to the nature of determining the information that is available — in many cases the individual’s address is not known (i.e., unknown status with “No address - no vaccination” reason). Also see remarks for [BR415](#).

Chapter 6: Operational Scenarios

This chapter presents typical and challenging operational scenarios that illustrate implementation of best practice recommendations. Evaluating principles (Chapter 3), business rules (Chapter 4), diagrams (Fig. 2), and decision tables for inclusion and exclusion of patients in reminder-recalls and assessments (Chapter 5), using real situations, should help the user of this guide to test and explore recommendations developed by the MIROW experts panel.

Operational scenarios are presented in [Table 8](#). These scenarios do not constitute an exhaustive set of all possible scenarios related to management of patient active/inactive status. Rather, they are a limited set of some typical and challenging situations and recommended resolutions that are based on principles, business rules, and decision tables formulated in chapters 3, 4, and 5. This set of scenarios can be expanded by individual IIS for training and operational purposes. The term “state” is used in these scenarios to represent a highest-level geographic jurisdiction (i.e., state, city).

In reviewing these scenarios, keep in mind that PAIS is relevant to three aspects of IIS operations:

1. Information that an EHR (as well as a Direct UI) captures and transmits to an IIS. The information is a snapshot in time for the EHR.
2. How an IIS interprets information in incoming data. For example, if incoming data from a provider organization contains information for the most recent immunization for a patient, the IIS would apply [BR402A](#) and [BR402B](#) to assign “Active” status to the patient for that provider organization. After full implementation of these guidelines, a provider organization HL7 status code “U” will not be an acceptable code. During a transition period prior to full implementation of these guidelines, an EHR might also transmit a provider organization status code of “U” in addition to information for the most recent immunization for a patient. The IIS will apply [BR402A](#) and [BR402B](#) to assign “Active” status to the patient for that provider organization. See [Chapter 7](#).
3. How an IIS applies PAIS to existing data in the IIS. For example, an IIS could apply [BR415](#) to change existing “Active” status at the geographic jurisdiction level to “Unknown” with the reason code “No activity for extended period of time”.

Operational scenarios are grouped in the following categories that describe various situations with a patient:

1. Place of Residence/Moving

- [S101](#). Patient moved out of state, but uses in-state provider organization
- [S102](#). Patient moved out of state and ceased to use in-state provider organizations
- [S103](#). Patient address not known, patient receives services within state

2. Changing provider organization

- [S201](#). Transfer of medical records

3. Service from more than one provider organization

- [S301](#). Patient lives with divorced parents: 1-1
- [S302](#). Patient lives with divorced parents: 1-M

4. Service from out-of-state provider organizations

- [S401](#). In-state patient uses out-of-state provider organization

5. Acceptable provider organization type

- [S501](#). Provider organization of an acceptable type: 1-1
- [S502](#). Provider organization of an acceptable type: 1-M
- [S503](#). Provider organization of not an acceptable type
- [S504](#). Birth dose submitted by hospital, acceptable type
- [S505](#). Birth dose submitted by hospital, not an acceptable type

6. Acceptable vaccination encounter type

- [S601](#). Vaccination encounter of an acceptable type: 1-1
- [S602](#). Vaccination encounter of an acceptable type: 1-M
- [S603](#). Vaccination encounter of not an acceptable type

7. Indirect status designation

- [S701](#). Patient demographics received with no address and no vaccination: 1-1
- [S702](#). Patient demographics received with no address and no vaccination: 1-M
- [S703](#). Patient demographics and historical immunizations; No existing record
- [S704](#). Patient demographics and historical immunizations; Existing Record; 1-1
- [S705](#). Patient demographics and historical immunizations; Existing Record; 1-M
- [S706](#). Patient demographics and historical immunizations; No existing record; Not acceptable provider type; 1-1

8. Direct status designation

- [S801](#). Patient demographics and historical Table 8. Selected operational scenarios.

Table 8. Selected operational scenarios.

#	Scenario	Resolution	Remarks
1. Place of Residence/Moving			
S 1 0 1	<p>S101. Patient moved out of state, but uses in-state provider organization</p> <ul style="list-style-type: none"> ■ Patient moved out of the state ■ Patient continues to use services of a provider organization within the state 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient status at the geographic level (state) should be set to "Inactive: Outside jurisdiction" ■ Patient status at the provider organization level should be set to "Active" with that in-state provider organization <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be excluded from the geographic jurisdiction (state) reminder-recalls and assessments ■ Patient should be included in the provider organization reminder-recalls and assessments. 	<ul style="list-style-type: none"> ■ See P310 "Out of state" patients. ■ See BR413 Inactive status at the geographic jurisdiction level with the reason code "Outside jurisdiction". ■ See BR402A and BR402B. Active status at the provider organization level.
S 1 0 2	<p>S102. Patient moved out of state and ceased to use in-state provider organizations</p> <ul style="list-style-type: none"> ■ Patient moved out of the state ■ Patient no longer receives services of a provider organization within the state 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient status at the geographic level (state) should be set to "Inactive: Outside jurisdiction." ■ Patient status at the provider organization level should be set to "Inactive: No longer a patient" for each in-state provider organization(s) that has an "Active," "Inactive-Lost to Follow Up," or "Inactive- Unspecified" status for that patient. <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be excluded from the geographic jurisdiction (state) reminder-recalls and assessments ■ Patient should be excluded from the provider organization reminder-recalls and assessments. 	<ul style="list-style-type: none"> ■ See BR413 Inactive status at the geographic jurisdiction level with the reason code "Outside jurisdiction". ■ See BR404A and BR404B Inactive status at the provider organization level with the reason code "No longer a patient."
S 1 0 3	<p>S103: Patient address not known, patient receives services within state</p> <ul style="list-style-type: none"> ■ Patient address is not known, and ■ Patient receives services from a provider organization within the state, Provider Org A 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient status at the geographic jurisdiction level (state) should be set to "Active." ■ Patient status at the provider organization level should be set to "Active" with Provider Org A. <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in the geographic jurisdiction (state) reminder-recalls and assessments ■ Patient should be included in Provider Org A provider organization reminder-recalls and assessments 	<ul style="list-style-type: none"> ■ See BR412 Active status at the geographic jurisdiction level and P303 'Avoid having people "fall through the cracks'. ■ See BR402A and BR402B Active status at the provider organization level.

#	Scenario	Resolution	Remarks
2. Changing provider organization			
S 2 0 1	S201. Transfer of medical records <ul style="list-style-type: none"> ■ A patient has “Active” status with Provider Org A ■ Provider Org A received a request to transfer the patient’s medical records to Provider Org B 	Status: <ul style="list-style-type: none"> ■ Patient status should be set to “Inactive: No longer a patient” relative to “Provider Org A” (by the IIS or by Provider Org A) ■ Patient status should be set to “Active” relative to Provider Org B (by the IIS or by Provider Org B) Consequences: <ul style="list-style-type: none"> ■ Patient should be excluded from reminder-recall and assessment reports for Provider Org A ■ Patient should be included in reminder-recall and assessment reports for Provider Org B 	<ul style="list-style-type: none"> ■ Inference: Patient is moving from one provider organization to another. ■ See BR404A and BR404B Inactive status at the provider organization level with the reason code “No longer a patient”. ■ See P307. Identification of an individual as NOT a patient of a provider organization.
3. Service from more than one provider organization			
S 3 0 1	S301. Patient lives with divorced parents: 1-1 <ul style="list-style-type: none"> ■ Patient (a child) lives interchangeably with each of her divorced parents (i.e., three months with one parent and then three months with another parent) ■ Patient switches back and forth (every three months) from Provider Org A to Provider Org B ■ Provider Org A and Provider Org B are contributing equally to the patient’s immunizations ■ Provider Org A conducted the latest vaccination event for the patient ■ IIS uses the 1-1 approach. 	Status: <ul style="list-style-type: none"> ■ Patient status should be set to “Active” relative to “Provider Org A” (by the IIS or by the Provider Org A) ■ Patient status should be set to “Inactive: No longer a patient” relative to Provider Org B (by the IIS) Consequences: <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org A ■ Patient should be excluded from reminder-recall and assessment reports for Provider Org B 	<ul style="list-style-type: none"> ■ See BR402A. Active status at the provider organization level: 1-1. ■ See BR404A. Inactive status at the provider organization level with the reason code “No longer a patient”: 1-1. ■ The same should apply when patient moves back from Provider Org B to Provider Org A.
S 3 0 2	S302. Patient lives with divorced parents: 1-M <ul style="list-style-type: none"> ■ Patient (a child) lives interchangeably with each of her divorced parents (i.e., three months with one parent and then three month with another parent). ■ Patient switches back and forth (every three months) from Provider Org A to Provider Org B ■ Provider Org A and Provider Org B are contributing equally to the patient’s immunizations. ■ Provider Org A conducted the latest vaccination event for the patient. ■ IIS uses the 1-M approach. 	Status: <ul style="list-style-type: none"> ■ Patient status should be set to “Active” relative to “Provider Org A” (by the IIS or by the Provider Org A) ■ Patient status should be set to “Active” relative to Provider Org B (by the IIS) Consequences: <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org A ■ Patient should be included in reminder-recall and assessment reports for Provider Org B 	<ul style="list-style-type: none"> ■ See BR402B Active status at the provider organization level: 1-M. ■ The same should apply when patient moves back from Provider Org B to Provider Org A.

#	Scenario	Resolution	Remarks
4. Service from out-of-state provider organizations			
S 4 0 1	<p>S401. In-state patient uses out-of-state provider organization</p> <ul style="list-style-type: none"> ■ Patient resides within the state ■ Patient is seeing a provider organization out of the state 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient status at the geographic level (state) should be set to "Active" ■ There is no status at the provider organization level with that out-of-state provider organization <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in the geographic jurisdiction (state) reminder-recalls and assessments 	<ul style="list-style-type: none"> ■ See notes for P310 "Out of state" patients. ■ See BR412 "Active" status at the geographic jurisdiction level
5. Acceptable provider organization type			
S 5 0 1	<p>S501. Provider organization of an acceptable type: 1-1</p> <ul style="list-style-type: none"> ■ Patient has an "Active" status with Provider Org A, where he/she regularly receives vaccinations. ■ Patient received a flu vaccination from Provider Org B, which is a pharmacy. ■ IIS uses the 1-1 approach. ■ IIS considers Provider Org B (pharmacy) as an acceptable provider organization type. 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient's status should be set to Active for Provider Org B (pharmacy). ■ Patient status should be set to "Inactive – No longer a patient" for Provider Org A. <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org B. ■ Patient should be excluded from reminder-recall and assessment reports for Provider Org A. 	<ul style="list-style-type: none"> ■ See BR402A Active status at the provider organization level: 1-1 ■ See BR404A Inactive status at the provider organization level with the reason code "No longer a patient": 1-1 ■ See the discussion of the term "Acceptable provider organization type" in Appendix A of this document.
S 5 0 2	<p>S502. Provider organization of an acceptable type: 1-M</p> <ul style="list-style-type: none"> ■ Patient has an Active status with Provider Org A, where he/she regularly receives vaccinations. ■ Patient received a flu vaccination from Provider Org B, which is a pharmacy. ■ IIS uses the 1-M approach. ■ IIS considers Provider Org B (pharmacy) as an acceptable provider organization type. 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient's status should be set to Active for Provider Org B (pharmacy). ■ Patient status should remain Active for Provider Org A". <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org A ■ Patient should be included in reminder-recall and assessment reports for Provider Org B 	<ul style="list-style-type: none"> ■ See BR402B Active status at the provider organization level: 1-M ■ See the discussion of the term "Acceptable provider organization type" in Appendix A of this document

#	Scenario	Resolution	Remarks
S 5 0 3	<p>S503. Provider organization of not an acceptable type</p> <ul style="list-style-type: none"> ■ Patient has an Active status with Provider Org A, where he/she regularly receives vaccinations ■ Patient received a flu vaccination from Provider Org B, which is a pharmacy ■ IIS does not consider Provider Org B (pharmacy) as an acceptable provider organization type 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient’s status should remain Active relative to Provider Org A ■ Patient status should be ‘unassigned’ with respect to Provider Org B. <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org A ■ Patient should be excluded from reminder-recall and assessment reports for Provider Org B 	<ul style="list-style-type: none"> ■ See BR402A and BR402B Active status at the provider organization level <ul style="list-style-type: none"> ■ A provider organization of not acceptable type is excluded from all provider organization level assessments and reminder-recalls. ■ See the discussion of the term “Acceptable provider organization type” in Appendix A of this document. ■ Note that the initial status for a relationship between a patient and a provider organization is “unassigned”, see Fig. 2, BR401, BR411, and P306.
S 5 0 4	<p>S504. Birth dose submitted by hospital, acceptable type</p> <ul style="list-style-type: none"> ■ Patient received birth doses of Hepatitis B at the hospital ■ No patient record existed prior to this dose, ■ Dose is reported to the IIS by the hospital ■ Patient address is within state ■ IIS considers the hospital an acceptable provider organization type. 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient status at the geographic jurisdiction level (state) should be set to “Active” ■ Patient status at the provider organization level should be set to “Active” <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for the geographic jurisdiction ■ Patient should be included in reminder-recall and assessment reports for the hospital 	<ul style="list-style-type: none"> ■ See BR412 Active status at the geographic jurisdiction level ■ See BR402A and BR402B Active status at the provider organization level.
S 5 0 5	<p>S505. Birth dose submitted by hospital, not an acceptable type</p> <ul style="list-style-type: none"> ■ Patient received birth doses of Hepatitis B at the hospital ■ No patient record existed prior to this dose ■ Dose is reported to the IIS by the hospital ■ Patient address is within state ■ IIS does <i>not</i> consider the hospital an acceptable provider organization type 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient status at the geographic jurisdiction level (state) should be set to “Active” ■ Patient status should remain ‘unassigned’ with respect to the hospital. <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for the geographic jurisdiction ■ Patient should be excluded from reminder-recall and assessment reports for the hospital 	<ul style="list-style-type: none"> ■ See BR412 Active status at the geographic jurisdiction level. <ul style="list-style-type: none"> ■ A provider organization of not acceptable type is excluded from all provider organization level assessments and reminder-recalls. ■ Note that the initial status for a relationship between a patient and a provider organization is “unassigned”, see Fig. 2, BR401, BR411, and P306.

#	Scenario	Resolution	Remarks
6. Acceptable vaccination encounter type			
S 6 0 1	<p>S601. Vaccination encounter of an acceptable type: 1-1</p> <ul style="list-style-type: none"> ■ Patient has an “Active” status with Provider Org A, where he/she regularly receives vaccinations. ■ Patient received a non-seasonal influenza (e.g., H1N1) vaccination from Provider Org B. ■ IIS uses the 1-1 approach. ■ IIS considers this vaccination encounter of an acceptable type (not a mass vaccination). ■ IIS considers Provider Org B as an acceptable provider organization type. 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient status should be set to Active for Provider Org B ■ Patient status should be set to “Inactive – No longer a patient” for Provider Org A <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org B ■ Patient should be excluded from reminder-recall and assessment reports for Provider Org A 	<ul style="list-style-type: none"> ■ See BR402A Active status at the provider organization level: 1-1. ■ See BR404A Inactive status at the provider organization level with the reason code “No longer a patient”: 1-1. ■ See the discussion of the term “Acceptable vaccination encounter type” in Appendix A of this document.
S 6 0 2	<p>S602. Vaccination encounter of an acceptable type: 1-M</p> <ul style="list-style-type: none"> ■ Patient has an Active status with Provider Org A, where he/she regularly receives vaccinations. ■ Patient received a non-seasonal influenza (e.g., H1N1) vaccination from Provider Org B. ■ IIS uses the 1-M approach. ■ IIS considers this vaccination encounter of an acceptable type (not a mass vaccination). ■ IIS considers Provider Org B as an acceptable provider organization type. 	<p>Status:</p> <ul style="list-style-type: none"> ■ Patient status should be set to Active for Provider Org B ■ Patient status should remain “Active” for Provider Org A. <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org B ■ Patient should be included in reminder-recall and assessment reports for Provider Org A 	<ul style="list-style-type: none"> ■ See BR402B Active status at the provider organization level: 1-M. ■ See the discussion of the term “Acceptable vaccination encounter type” in Appendix A of this document.
S 6 0 3	<p>S603. Vaccination encounter of not an acceptable type</p> <ul style="list-style-type: none"> ■ Patient has an Active status with Provider Org A, where he/she regularly receives vaccinations ■ Patient received a non-seasonal influenza (e.g., H1N1) vaccination from the Provider Org B ■ IIS considers this vaccination encounter of not an acceptable type (i.e., a mass vaccination) ■ IIS considers Provider Org B as an acceptable provider organization type 	<p>Status (applies to both 1-1 and 1-M):</p> <ul style="list-style-type: none"> ■ Patient status should remain Active for Provider Org A ■ Patient status should remain the same with respect to Provider Org B, i.e., <ul style="list-style-type: none"> ■ “Unassigned”, if patient had no prior relationship (i.e., has an initial, i.e., “unassigned” status) with Provider Org B ■ “Active” (in 1-M IIS) or “Inactive” (in 1-1 and 1-M IIS), if patient had prior relationship (i.e., some assigned status) with Provider Org B via vaccination encounters of an acceptable type <p>Consequences:</p> <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org A ■ Patient should be <ul style="list-style-type: none"> ■ Excluded from reminder-recall and assessment reports for Provider Org B if status is “unassigned” or inactive ■ Included in reminder-recall and assessment reports for Provider Org B if status is active (1-M IIS only) 	<ul style="list-style-type: none"> ■ See BR402A and BR402B Active status at the provider organization level: ■ See the discussion of the term “Acceptable vaccination encounter type” in the Appendix A of this document. ■ Note that the initial status for a relationship between a patient and a provider organization is “unassigned”, see Fig. 2, BR401, BR411, and P306.

#	Scenario	Resolution	Remarks
7. Indirect Assignment of Status			
S701	<p>S701: Patient demographics received with no address and no vaccination: 1-1</p> <ul style="list-style-type: none"> IIS received a demographic-only submission from Provider Org A. IIS considers Provider Org A to be of an acceptable provider organization type. Address is not provided in the submission. No vaccination data ever received for patient. No status indicated in the submission. IIS uses the 1-1 approach. 	<p>Status:</p> <ul style="list-style-type: none"> Patient status at the geographic jurisdiction level (state) should be set to "Unknown: No Address - No Vaccination." If a new patient's record is created in IIS, patient status should be set to "Active" for Provider Org A at the provider organization level If an existing patient's record is updated in IIS, the patient status should remain the same with Provider Org A. <p>Consequences:</p> <ul style="list-style-type: none"> IIS makes determination whether to include patient in the geographic jurisdiction (state, city) reminder-recalls Patient should be included in the geographic jurisdiction (state) assessments (unless other methods are used to control for denominator inflation – see Chapter 5, section Assessment Report at the Geographic Jurisdiction level) If a new patient's record is created in IIS ("Active" status), patient should be included in the Provider Org A reminder-recalls and assessments 	<ul style="list-style-type: none"> See BR414 Unknown status at the geographic jurisdiction level with the reason code "No address - no vaccination". See BR402A. Active status at the provider organization level: 1-1. See decision tables in Chapter 5.
S702	<p>S702: Patient demographics received with no address and no vaccination: 1-M</p> <ul style="list-style-type: none"> IIS received a demographic-only submission from Provider Org A. IIS considers Provider Org A to be of an acceptable provider organization type. Address is not provided in the submission. No vaccination data ever received for patient. No status indicated in the submission. IIS uses the 1-M approach. 	<p>Status:</p> <ul style="list-style-type: none"> Patient status at the geographic jurisdiction level (state) should be set to "Unknown: No Address, No Vaccination." Patient status should be set to "Active" at the provider organization level <p>Consequences:</p> <ul style="list-style-type: none"> IIS makes determination whether to include Patient in the geographic jurisdiction (state, city) reminder-recalls Patient should be included in the geographic jurisdiction (state) assessments Patient should be included in the Provider Org A reminder-recalls and assessments 	<ul style="list-style-type: none"> See BR414 Unknown status at the geographic jurisdiction level with the reason code "No address - no vaccination". See BR402B Active status at the provider organization level: 1-M.
S703	<p>S703. Patient demographics and historical immunizations; No existing record</p> <ul style="list-style-type: none"> Provider Org A submits patient demographic information (with the in-state address or without address) and historical immunizations Provider Org A is an acceptable type provider No status is indicated in the submission No existing patient record in IIS 	<p>Status (applies to both 1-1 and 1-M):</p> <ul style="list-style-type: none"> Patient status at the geographic jurisdiction level (state) should be set to 'Active' Patient status should be set to 'Active' for Provider Org A <p>Consequences:</p> <ul style="list-style-type: none"> Patient should be included in reminder-recall and assessment reports for the geographic jurisdiction level. Patient should be included in reminder-recall and assessment reports for Provider Org A 	<ul style="list-style-type: none"> See BR402A and BR402B Active status at the provider organization level.

#	Scenario	Resolution	Remarks
S 7 0 4	S704. Patient demographics and historical immunizations; Existing Record; 1-1 <ul style="list-style-type: none"> ■ Provider B submits patient demographics and historical immunizations. ■ Provider B is of an acceptable provider type. ■ No status is indicated in the submission. ■ There is an existing patient record in IIS with "Active" status for Provider Org A. ■ IIS uses 1-1 approach. 	Status: <ul style="list-style-type: none"> ■ Patient status remains "Active" for Provider Org A. ■ Patient status remains "Unassigned" for Provider Org B. Consequences: <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org A. ■ Patient should not be included in reminder-recall and assessment reports for Provider Org B. 	<ul style="list-style-type: none"> ■ See BR402A Active status at the provider organization level, 1-1. ■ Note that the initial status for a relationship between a patient and a provider organization is "unassigned", see Fig. 2, BR401, BR411, and P306.
S 7 0 5	S705. Patient demographics and historical immunizations; Existing Record; 1-M <ul style="list-style-type: none"> ■ Provider B submits patient demographics and historical immunizations. ■ No status is indicated in the submission. ■ There is an existing patient record in IIS with "Active" status for Provider Org A. ■ IIS uses 1-M approach. 	Status: <ul style="list-style-type: none"> ■ Patient status should remain "Active" for Provider Org A. ■ Patient status should be set to "Active" for Provider Org B. Consequences: <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org A. ■ Patient should be included in reminder-recall and assessment reports for Provider Org B. 	<ul style="list-style-type: none"> ■ See BR402B Active status at the provider organization level, 1-M.
S 7 0 6	S706. Patient demographics and historical immunizations; No existing record; Not acceptable provider type; 1-1 <ul style="list-style-type: none"> ■ Provider A submits patient demographics and immunizations. ■ Provider A is not an acceptable provider type ■ No existing record in the IIS. ■ No status is indicated in the submission. ■ IIS uses 1-1 approach. 	Status: <ul style="list-style-type: none"> ■ Patient status should be set to "Active" at the geographic jurisdiction level if no address or address is within the jurisdiction. ■ Patient status should remain "Unassigned" at the provider organization level. Consequences: <ul style="list-style-type: none"> ■ Patient should not be included in reminder-recall and assessment reports for Provider Org A. ■ Patient should be included in reminder-recall and assessment reports for geographic jurisdiction. 	<ul style="list-style-type: none"> ■ See BR402A Active status at the provider organization level, 1-1. ■ Note that the initial status for a relationship between a patient and a provider organization is "unassigned", see Fig. 2, BR401, BR411, and P306.
8. Direct Assignment of Status			
S 8 0 1	S801. Patient demographics and historical immunizations; Existing Record; 1-1 <ul style="list-style-type: none"> ■ Provider A submits patient demographics and historical immunizations. ■ Status "Active" is indicated in the submission. ■ There is an existing patient record in IIS with "Active" status for Provider Org B. ■ IIS uses 1-1 approach. 	Status: <ul style="list-style-type: none"> ■ Patient status should be set to "Active" for Provider Org A. ■ Patient status should be set to "Inactive, reason code "No longer a patient" for Provider Org B. Consequences: <ul style="list-style-type: none"> ■ Patient should be included in reminder-recall and assessment reports for Provider Org A. ■ Patient should not be included in reminder-recall and assessment reports for Provider Org B. 	<ul style="list-style-type: none"> ■ See BR402A Active status at the provider organization level. ■ See P308, Supremacy of PAIS explicit assignment.

Chapter 7: HL7 Immunization Messaging Considerations

This chapter describes how data submitted using the Health Level Seven (HL7) specification may be used to determine patient status.

Provider organizations submit vaccination events and patient demographic information to IIS via Electronic Data Exchange (EDE) and IIS direct user interface (see [Appendix A, Terms and Definitions](#)). EDE is the interface in which data can be communicated electronically between a provider organization's system, such as Electronic Health Records (EHR) system, and the IIS.

Corresponding electronic messages use Health Level Seven (HL7) specification, which is a nationally recognized standard for electronic data exchange between systems housing healthcare data. HL7 specification defines a syntax or grammar for formulating the messages that carry this information, as well as describes a standard vocabulary that is used in these messages.

Patient status at the provider organization level

Direct identification

Information about status of a patient at the provider organization level is a part of the overall information on vaccination events and patient demographics submitted by a provider organization to IIS. It indicates if the provider organization considers itself responsible for that patient's immunizations (i.e., this is our patient or this is not our patient).

Currently, the HL7 specification for IIS, known as [Implementation Guide for Immunization Messaging](#) [2.5], **directly** addresses transmission of the patient active/inactive status information at the following sections:

- Field PD1-16 Immunization Registry Status (IS) 01569 (PD1-17 is the date associated with status).
- Appendix A, Code Tables: User-defined Table 0441 - Immunization registry status (includes the valid values used for PD1-16).

PD1 is a segment in the VXU (unsolicited immunization update) message; it is required, but may be empty (RE) (i.e., if there are data, it is required [senders must be able to record it and send it, if populated]). PD1-16 may be used to identify the current status of the patient in relation to the sending provider organization. It is used to indicate if the provider organization considers itself responsible for that patient's immunizations (i.e., this is our patient or this is not our patient). This field in the PD1 segment is then used to update the relationship between the patient and the provider organization in the IIS.

[Table 9](#) supports direct coding of PAIS in HL7 messages; it clarifies categories of statuses described in the HL7 specification [2.5], User-defined Table 0441.

Table 9. Direct Coding of PAIS at the provider organization level in HL7 messages.

Statuses from the HL7 specification [2.5], User-defined Table 0441		Clarification of status categories	
Value	Description	Name	Reference
Provider Organization Level (statuses and codes in the current HL7 specification are shown)			
A	Active	Active	BR402A BR402B
I	Inactive-Unspecified	Inactive-Unspecified	BR406
L	Inactive-Lost to follow-up (cannot contact)	Inactive-Lost to follow-up	BR405
M	Inactive-Moved or gone elsewhere (transferred)	Inactive-No longer a patient	BR404A BR404B
P	Inactive-Permanently inactive (do not re-activate or add new entries to this record)	Deceased (see Note 1 below)	BR421
U	Unknown	N/A	N/A

Notes:

1. When status code “P” is received in an HL7 message, the patient status should not be updated until there is a secondary confirmation of the death, either from the family, practice, vital records, or if PID-30 is filled with “Y.”
2. Current (as of April 2015) HL7 codes/values for patient active/inactive statuses at the provider organization level presented in the HL7 specification ([HL7 Version 2.5.1: Implementation Guide for Immunization Messaging, Release 1.5](#)) are defined according to the 2005 MOGE guide [1.7].
3. See [Appendix B](#) for a detailed comparison of statuses between this document and the 2005 MOGE guide.

Death Indicator. The HL7 message can be used to indicate that a patient is deceased. When this information is available from the sending system, PID-30 has a valid value of ‘Y’ (HL7 Table 0136) when a patient is deceased and PID-29 includes the patient’s date and time of death. This information is used as previously indicated in [BR421](#) to change the patient’s status at both the provider organization and geographic levels. The HL7 message should be considered a confirming message from the provider organization.

An IIS program may want to consider turning off reminder-recall notifications if a P is received without the PID-30 field filled in with a “Y”. The program can investigate the death notification further for confirmation, but it would be important to prevent a notification from being sent to a family member if the individual was deceased. See [BR421](#).

Indirect identification

The HL7 2.5.1 Implementation Guide indirectly addresses the patient active/inactive status in the RXA (Pharmacy/ Treatment Administration) segment for the provider organization level by utilizing data included in RXA segment:

- Field: RXA-3 Date/Time Start of Administration
- Field: RXA-9 Administration Notes
- Field: RXA-11 Administered-at Location LA2 data type

RXA-3 is a required field in the HL7 message that indicates the date of the vaccine administration. This information is needed to determine the most recent acceptable vaccine administration for IIS that use the [1-1 approach](#).

RXA-9 is used to indicate whether the vaccine is newly administered or is a historical record. Code values for RXA-9 are in Appendix A: NIP001 – Immunization information source). Administered vaccines are identified in RXA-9 with the code value: 00. Whether a vaccine is newly administered or historical is used in determining the active status between the patient and provider organization if the [1-1 approach](#) is used by the IIS. Reference [P306](#), [BR402A](#), and [S704](#).

RXA-11 is used to indicate the clinic or office site where the vaccine was administered. The RXA-11 field is required for newly administered vaccines as indicated in RXA-9. This field identifies the practice (provider organization). Other IIS enrollment information will be used to then determine whether the site (provider organization) listed in RXA-11 is an [acceptable type](#).

The information in RXA-3, RXA-9, and RXA-11 is used to establish or change the patient active/inactive status for the Provider organization. This information is used differently by the IIS that use the [1-1 and 1-M approaches](#).

Publicity Code. The RE (Required but may be empty) PD1 segment contains a publicity code, PD1-11 with RE usage. The code is CE data type and refers to how a person wishes to be contacted for reminder or recall. The code set is in User-defined Table 0215 – Publicity code. This information may be used by the provider organization or geographic jurisdiction to determine additional exclusions from reminder-recall activities or to determine the manner of reminder-recall.

Protection Indicator. PD1-12 is an RE (Required but may be empty) field. It identifies whether a person's information may be shared with others by the sending system. Y – indicates the data are protected and should not be shared. N – indicates that it is not necessary to protect the data and sharing is OK. How the data are protected is determined locally. See [P313](#), [P314](#).

Patient status at the geographic jurisdiction level

HL7 messages should be used to update patient address information. Patient/geographic jurisdiction status can then be determined **indirectly** from address information obtained from an HL7 message. The HL7 message from a provider organization within the geographic jurisdiction shall be considered a confirmed address. HL7 VXU messages contain a required PID segment with a patient address field PID-11 (XAD data type with usage of RE). The address type is required for XAD data type. The code table can be found in Appendix A: HL7-defined Table 0190-Address type. If the address type is coded P (Permanent) or H (Home), it can be used to determine if the individual is attributed to a specific geographic jurisdiction.

Note that the active status at the geographic level should depend not only on a known address. Business rule [BR412](#) specifies the following conditions for assignment of active status at the geographic jurisdiction level:

- Individual residence within the geographic jurisdiction has been confirmed.
- Individual received an immunization from a provider organization within the geographic jurisdiction and individual's address is not known (this condition applies only to highest level geographic jurisdiction such as state or city).

Conclusions

The guidelines offer consensus-based best practice recommendations to support management of patient active/inactive status in IIS. The guidelines will assist IIS in aligning practices through adherence to a set of common recommendations and guidelines.

The following is a brief description of the key outcomes and accomplishments of the MIROW Work Group:

- Identified and described two common approaches to implementing the concept of a provider organization having “responsibility” for immunizing a patient (i.e., “1 to 1” and “1 to many” approaches).
- Defined **5 patient statuses** at the provider organization level and **5 patient statuses** at the geographic jurisdiction level.
- Formulated **14 principles** and **13 business rules** to guide assignment and management of patient status in IIS.
- Developed **4 decision tables** for inclusion of patients in assessment reports and reminder-recall notifications based on the patient status.
- Developed **22 operational scenarios** that illustrate implementation of principles and business rules in some typical and challenging everyday situations.
- Provided recommendations for implementing formulated best practices with current HL7 messaging standard for electronic data exchanges between provider organizations and IIS.
- Developed and reconfirmed key concepts, terms, and definitions related to various aspects of managing patient status in IIS for the purposes of reminder-recall notifications and assessment reports.

MIROW brought together experts from the IIS community, CDC, and IT vendors. The resulting best practices guide is a step in standardizing practices in the area of data quality assurance in IIS. Developed recommendations are intended to be at the business/operational level. As a result, they are independent from particular IIS implementations and technology solutions. Accordingly, the recommendations can be used to support the wide variety of IIS implementation strategies on different technological platforms. The approach and results presented are relevant for and can be used beyond immunization information systems—for developing and documenting best practices and operational requirements for application in public health, health care, and other areas.

The National Vaccine Advisory Committee (NVAC) has included a recommendation to “promote the adoption of a guidebook and best practices for IIS as stated by the CDC/NIP [now NCIRD] and AIRA/MIROW Work Group to adopt consistent operational guidance and quality control procedures that ensure good data quality.” This best practices guide is one example of addressing the NVAC recommendation. It will assist IIS in aligning practices through adherence to a set of common recommendations and guidelines. As a result, IIS will be able to better serve the needs of immunization programs and provider organizations.

Selected References

Previously developed guidelines

MIROW recommendations documents for previous topics, abridged mini-guides, and other materials are available at the AIRA and CDC websites.

- 1.1) AIRA Modeling of Immunization Registry Operations Work Group (eds). **Data Quality Assurance in Immunization Information Systems: Selected Aspects**. Atlanta, GA: American Immunization Registry Association. May 2013.
http://www.immregistries.org/resources/AIRA-MIROW_DQA_Selected_Aspects_best_practice_guide_05-17-2013.pdf
- 1.2) AIRA Modeling of Immunization Registry Operations Work Group (eds). **Immunization Information System Inventory Management Operations**. Atlanta, GA: American Immunization Registry Association. June 2012.
<http://www.immregistries.org/AIRA-MIROW-Inventory-Management-best-practice-guide-06-14-2012.pdf>
- 1.3) AIRA Modeling of Immunization Registry Operations Work Group (eds). **Immunization Information System Collaboration with Vaccines for Children Program** and Grantee Immunization Programs. Atlanta, GA: American Immunization Registry Association. April 2011.
http://www.immregistries.org/AIRA-MIROW_IIS-VFC_Best_Practice_Guide_04-14-2011.pdf
- 1.4) AIRA Modeling of Immunization Registry Operations Work Group (eds). **Reminder/Recall** in Immunization Information Systems. Atlanta, GA: American Immunization Registry Association. April 2009.
http://www.immregistries.org/resources/AIRA-MIROW_RR_041009.pdf
- 1.5) AIRA Modeling of Immunization Registry Operations Work Group (eds). **Data quality assurance** in Immunization Information Systems: Incoming Data. Atlanta, GA: American Immunization Registry Association. February 2008.
http://www.immregistries.org/AIRA_MIROW_Chap3_DQA_02112008.pdf
- 1.6) AIRA Modeling of Immunization Registry Operations Work Group (eds). **Vaccination level deduplication** in Immunization Information Systems. Atlanta, GA: American Immunization Registry Association. December 2006.
http://www.immregistries.org/resources/AIRA-BP_guide_Vaccine_DeDup_120706.pdf
- 1.7) AIRA Modeling of Immunization Registry Operations Work Group (eds). **Management of Moved or Gone Elsewhere (MOGE) Status and Other Patient Designations** in Immunization Information Systems. Atlanta, GA: American Immunization Registry Association. December 2005.
http://www.immregistries.org/resources/MIROW-MOGE_Chapter_Final_122005_rev1.doc
- 1.8) AIRA Vaccine Safety and Registry Community Work Group (eds). **IIS-VAERS Collaboration For Vaccine Adverse Events Reporting**. Functional and Process Recommendations. Atlanta, GA: American Immunization Registry Association. April 2005.
http://www.immregistries.org/resources/IIS-VAERS_Collaboration_-_VASREC_Workgroup_04-20-2005.pdf

General references

- 2.1) Immunization Information System (IIS) Functional Standards
<http://www.cdc.gov/vaccines/programs/iis/func-stds.html>
- 2.2) AFIX Program Policies and Procedures Guide for Awardees
<http://www.cdc.gov/vaccines/programs/afix/standards.html>
- 2.3) IPOM: Immunization Program Operations Manual
<http://www.cdc.gov/vaccines/imz-managers/guides-pubs/index.html>
- 2.4) VFC Operations Guide
<http://www.cdc.gov/vaccines/programs/vfc/index.html>
- 2.5) HL7 Version 2.5.1: Implementation Guide for Immunization Messaging, Release 1.5:
<http://www.cdc.gov/vaccines/programs/iis/technical-guidance/hl7.html>
- 2.6) Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book): Course Textbook
<http://www.cdc.gov/vaccines/pubs/pinkbook/index.html>
- 2.7) Meaningful Use Definition and Objectives
<http://www.healthit.gov/providers-professionals/meaningful-use-definition-objectives>

Abbreviations

Abbreviation	Full version
AFIX	Assessment, Feedback, Incentives, and eXchange
AIRA	American Immunization Registry Association
BR	Business Rule
CDC	Centers for Disease Control and Prevention
EMR/EHR	Electronic Medical Record/Electronic Health Record
DOB	Date of Birth
EDE	Electronic Data Exchange
GJ	Geographic Jurisdiction
GR	General Recommendation
HL7	Health Level Seven International
IIS	Immunization Information System
MIROW	Modeling of Immunization Registry Operations Work Group
MOGE	Moved or Gone Elsewhere
N/A, NA, na	Not Applicable
Org	Organization
P	Principle (high-level business rule)
PAIS or status	Patient Active Inactive Status
RR	Reminder-recall
SME	Subject Matter Expert
UI	User Interface
VFC	Vaccines for Children
Y/N	Yes/No

Appendix A:

Terms and Definitions defined via Domain Model

In developing a domain model for this topic, the panel of experts took as a starting point existing models constructed for previous MIROW topics in 2005–2013, with a special focus on models developed for the original 2005 patient active/inactive topic [\[1.7\]](#), 2009 reminder/recall topic [\[1.4\]](#), and 2013 data quality assurance topic [\[1.1\]](#).

Domain model purpose

A domain model captures a business vocabulary — agreed upon terms and definitions. It ensures that all terminology and concepts that will appear in the process description, principles, and business rules are known and understood by the domain practitioners (agreed-upon definitions and meanings).

The purpose of employing a domain model (a.k.a. as fact model, concept model) is to:

- Document agreed-upon terms and definitions for the project.
- Facilitate discussions of the terms and definitions among project participants and provide tools to capture outcomes of these discussions.
- Establish a foundation and a reference source (common vocabulary) for other project materials.

Unlike a data model diagram that depicts storage of information, or a workflow/process diagram that depicts the sequence of steps in a process, a domain diagram is a high-level static representation of the main “things” (entities) involved in the immunization process, including a description of how these “things” (entities) are related. It is important to note that the domain diagram is not a technical specification. Instead, the domain diagram provides the foundation for other modeling diagrams and materials.

A domain model includes:

- Domain diagram(s) that shows major business entities (concepts), their relationships, and responsibilities ([Fig. 3](#) and [Fig. 4](#)).
- Table of entities and attributes — provides the full descriptive details of the components represented on the diagram ([Table 10](#) and [Table 11](#)):
 - Numbering of the entities and attributes on diagrams correspond to numbers in the table of terms and definitions.
- Description of the domain diagram(s) (presented below).

How to read and interpret the domain diagram

(see [Figure 4](#)):

- Relationships between entities are visualized by connecting lines.
- Names associated with these lines describe the types of relationships between entities. Example: A relationship between *Provider Organization* and *Vaccination Encounter* is shown as a connecting line with the word (label) “*conducts*.” Such a relationship should be read as “*Provider Organization conducts Vaccination Encounter*.”
- The general convention for interpretation of relationships between entities is to construct such a description by **reading clockwise**, starting from the first entity name (*Provider Organization*), then relationship name—*conducts* (note that the name is shown at the right side of the line, supporting a clockwise reading), then the second entity name (*Vaccination Encounter*).
- If we need to read the same description in the opposite direction, from *Vaccination Encounter* to *Provider Organization*, we would have to place a second name — “*conducted by*” — at the left side of the line. In this case, using the **clockwise reading rule**, a description would be “*Vaccination Encounter is conducted by the Provider Organization*.” In most cases only one name for a relationship is employed (such as “*conducts*” in the example just considered), assuming that it should be sufficient for a proper interpretation of a relationship in both directions.

Description of facts depicted on domain diagrams

At the highest level, main concepts/things of importance for the immunization domain are presented in [Figure 3](#) below. The diagram shows major categories of concepts/things we care about. These major categories of concepts/things will be developed further to identify and describe more detailed and specific concepts, terms, and definitions that are relevant to the patient active/inactive status topic.

Following is a description of facts presented on this highest level domain diagram ([Fig. 3](#)):

- Public Health/Healthcare offers Immunizations to Population/Patients.
- Public Health/Healthcare serves Geographic Areas/ Locations.
- Population/Patients reside at Geographic Areas/ Locations.
- Immunization Tracking collects and stores information about Immunizations.
- Public Health/Healthcare analyzes and uses results of Immunization Tracking.
- Immunization Tracking is conducted for Population/ Patients.

A more detailed and practicable domain diagram is presented below in [Figure 4](#). Note that elements on that diagram are grouped and color-coded according to major categories defined in [Figure 3](#).

Following is a description of facts presented in the domain diagram (Figure 4). These facts describe relationships between the main entities that are relevant for the scope of this particular topic.

- Population Group/Cohort is a collection of Individuals; it belongs to a Geographic Jurisdiction. State, City, County, as well as Other Geographic Area, are types of a Geographic Jurisdiction. Geographic Jurisdiction may contain another Geographic Jurisdiction.
- Immunization Program serves a Geographic Jurisdiction. It plays a role of a Public Health Authority and is responsible for Individuals that comprise Population Groups/Cohorts in the Geographic Jurisdiction (Geographic Jurisdiction [GJ] responsibility level).
- Immunization Program has an Immunization Information System.
- Patient is a type of Individual who is associated with a Provider Organization. Every Patient is an Individual, but not every Individual is a Patient.
- Provider Organization is responsible for a Patient (Provider Organization [PO] responsibility level).
- Patient has PAIS at the PO Level (patient active/inactive status at the Provider Organization level); Individual has PAIS at the GJ (Geographic Jurisdiction) Level.
- Individual resides at a Place of Residence that is located in a Geographic Jurisdiction. Individual can be contacted via a Contact Method (i.e., mail, telephone, e-mail, etc.).
- Report is produced for a Population Group/Cohort that is made up of Individuals/ Patients and covered by a Geographic Jurisdiction and a Provider Organization. Accordingly, such a Report can contain detailed information on an Individual/Patient.
- There are the following Report types: Assessment Report and R/R (reminder-recall) Report.
- Patient is vaccinated at Vaccination Event conducted by Provider Organization. Vaccine is administered at Vaccination Event. During the Vaccination Encounter (office visit) several Vaccination Events can be performed.
- Immunization History for a Patient contains Vaccination Events that are consolidated by the Immunization Information System.
- Provider Organization originates Submission that describes Vaccination Events (immunization information) and Patients (demographic information) to the Immunization Information System via Electronic Data Exchange or IIS Direct user Interface.

Domain diagrams

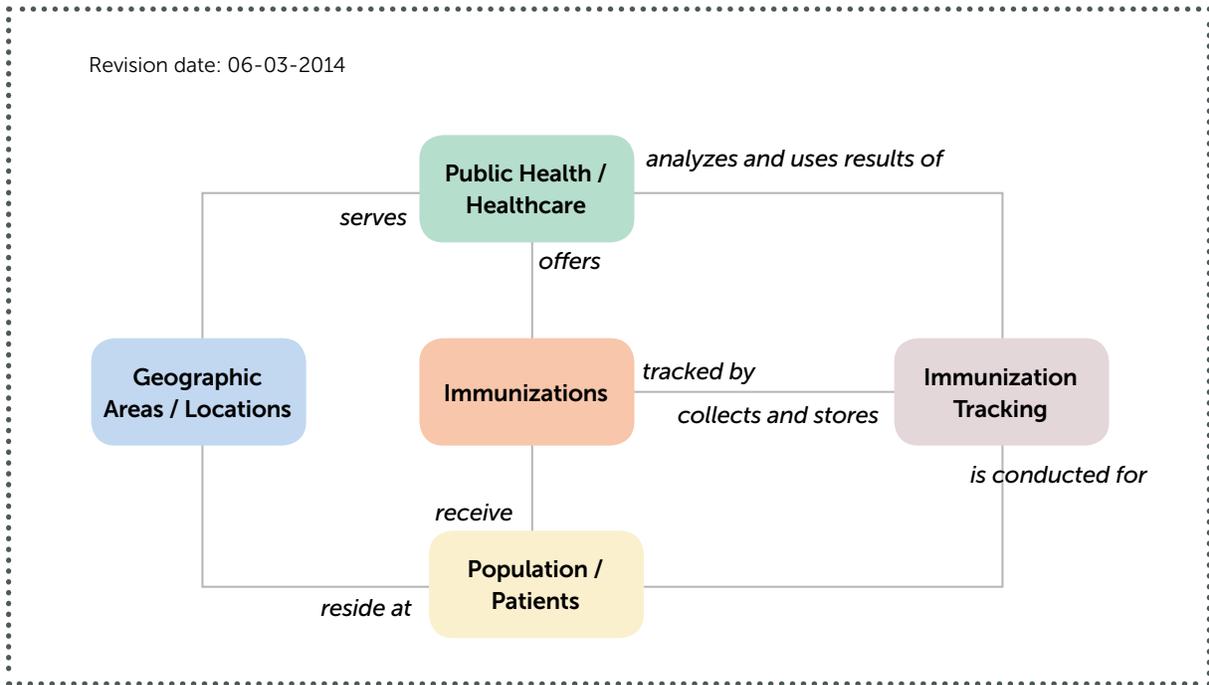


Figure 3. Highest-level diagram for the immunization tracking domain

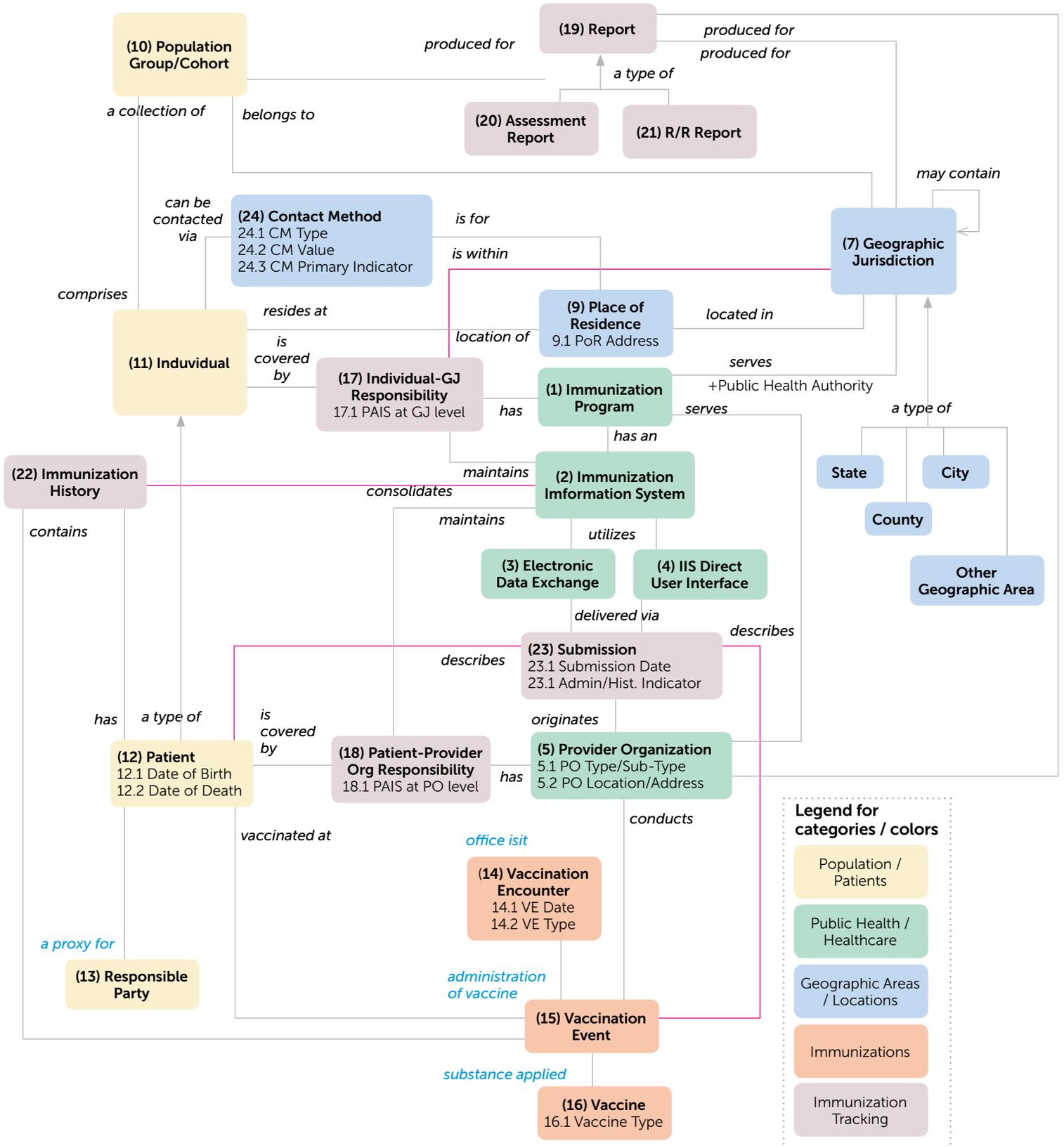


Figure 4. Domain diagram for the patient active/inactive status topic.

Tables of terms and definitions

Table 10 below presents terms and definitions in numerical order (as numbered on the diagram in [Figure 4](#)); [Table 11](#)– in an alphabetical order.

Table 10. Domain model - terms and definitions (see [Figure 4](#))

ID	Name	Description	Remarks
1	Immunization Program	Immunization Program at the level of CDC awardee (i.e., at the state, city, or territory)	<ul style="list-style-type: none"> ■ Vaccines for Children (VFC) program [2.4]. The VFC program is a federally funded program that provides vaccines at no cost to children who might not otherwise be vaccinated because of inability to pay. The VFC program is implemented on federal, awardee, and provider organization levels. ■ Assessment, Feedback, Incentives, eXchange - AFIX [2.2]. The AFIX approach used by CDC awardees, incorporates strategies to improve provider organizations' immunization service delivery and raise vaccination coverage levels.
2	Immunization Information System (IIS)	Immunization information systems (IIS) are confidential, population-based, computerized databases that record all immunization doses administered by participating providers to persons residing within a given geopolitical area.	<ul style="list-style-type: none"> ■ At the point of clinical care, an IIS can provide consolidated immunization histories for use by a vaccination provider in determining appropriate client vaccinations. ■ At the population level, an IIS provides aggregate data on vaccinations for use in surveillance and program operations, and in guiding public health action with the goals of improving vaccination rates and reducing vaccine-preventable disease. ■ See http://www.cdc.gov/vaccines/programs/iis/about.html.
3	Electronic Data Exchange	Electronic Data Exchange is the interface in which data can be communicated electronically between a third party system (e.g., provider organization's system) and the IIS.	<ul style="list-style-type: none"> ■ Examples of third party systems are: EHR, HIE, and Billing systems. ■ "There is no commonly understood distinction between the concepts of an electronic health record and an electronic medical record, and no such distinction has been made uniformly in the literature." -- Alan R. Hinman and David A. Ross. Immunization Registries Can Be Building Blocks For National Health Information Systems. HEALTH AFFAIRS 29, NO. 4 (2010): 676–682. ■ <i>For the purposes of this project, the term "EHR system" will be used to refer to both EHR and EMR systems.</i> ■ HL7 is a standard used for exchanging immunization information with IIS [2.5].
4	IIS Direct User Interface (Direct UI)	This is the application for the user to submit data directly to or retrieve data directly from the IIS; usually accessed via the Web.	<ul style="list-style-type: none"> ■ User interface, although not entirely error-free, is an opportunity for human evaluation and decision. ■ Throughout the document, this term is referenced in abbreviated forms as IIS Direct UI, Direct UI, or UI.
5	Provider Organization	Provider Organization is an organization that provides vaccination services or is "accountable" for an entity which provides vaccination services.	<ul style="list-style-type: none"> ■ Provider Organizations include a collection of related Providers (e.g., clinicians – physicians, nurses).

ID	Name	Description	Remarks
5.1	PO Type/Sub-Type	Describes a combination of population groups and services provided by the Provider Organization.	<ul style="list-style-type: none"> ■ Knowing the type of practice can help determine if patient can be associated with this practice as an “active” patient. <ul style="list-style-type: none"> ■ See “Discussion” section at the end of this appendix for a discussion of acceptable provider organization type. ■ May be sufficient to assign only the type (e.g., Specialty Provider); in these cases, the sub-type is not needed. ■ Example: <ul style="list-style-type: none"> ■ Type = Specialty Provider, Sub-type = OB/GYN ■ Type = Hospital, Sub-type = ER ■ There could be multiple layers to one Provider Organization (e.g., family practice may be also OB/GYN).
5.2	PO Location/ Address	The address of the Provider Organization.	<ul style="list-style-type: none"> ■ Possible fields to include with address are city, state, county, country, zip code, telephone number, and jurisdiction.
7	Geographic Jurisdiction	The Geographic Jurisdiction could be a State, a metropolitan area (New York City, Chicago, etc.), a county within a State, or some other subdivision of a larger Geographic Jurisdiction.	<ul style="list-style-type: none"> ■ A jurisdiction might encompass the entire country, as is the case with nationwide jurisdictions such as the jurisdictions of the Veterans Administration (“non-geographic jurisdiction”). ■ Types of Geographic Jurisdiction include state, city, and county, as well as Other Geographic Area (the term was introduced since a “pocket of need” could be for a geographic area other than an official “jurisdiction”).
9	Place of Residence (PoR)	A place where Individual/Patient resides.	<ul style="list-style-type: none"> ■ Individual/Patient can have more than one Place of Residence.
9.1	PoR Address	The address of the Place of Residence	<ul style="list-style-type: none"> ■ Data elements include: number, street, city, zip or postal code, state, and county or public health entity area of responsibility. ■ PO Box addresses should be accepted and utilized by IIS in the same way as street addresses. ■ Some HL7 submissions have no patient address. Such submissions should be accepted by IIS and patient should be considered residing within the Geographic Jurisdiction until proven otherwise (i.e., error on the side of inclusion); see BR412 ■ IIS may capture historical addresses as well as current address. ■ It is beneficial to store 1 physical address plus 1 mailing address plus all historical addresses.
10	Population Group / Cohort	A group of individuals who share a common characteristic (e.g., age); part of the population within a Geographic Jurisdiction.	<ul style="list-style-type: none"> ■ Webster: “A group of individuals having a statistical factor (as age or class membership) in common in a demographic study <a cohort of premedical students>.” ■ Wiki: “A cohort is a group of people who share a common characteristic or experience within a defined period (e.g., are born, are exposed to a drug or vaccine or pollutant, or undergo a certain medical procedure).”
11	Individual	A person. Individuals comprise a Population.	<ul style="list-style-type: none"> ■ A Patient is “a type of” Individual. Every Patient is an Individual, but not every Individual is a Patient.

ID	Name	Description	Remarks
12	Patient	An Individual who is the actual or potential recipient of a dose of Vaccine from a Provider Organization.	<ul style="list-style-type: none"> ■ Every Patient is an Individual, but not every Individual is a Patient. ■ For purposes of Data Quality, Patients are assumed to be deduplicated. Refer to the guidelines on patient-level deduplication (http://www.immregistries.org/resources/iis-meetings/Fred_Grant_AIRA_De-Duplication_Presentation.pdf). ■ Provider Organizations may report Patient demographic information without Vaccination Event information.
12.1	Date of Birth	The birth date of the patient.	<ul style="list-style-type: none"> ■ A.k.a. DOB. ■ Date of Birth received from Vital Records is considered more accurate than other sources of Date of Birth.
12.2	Date of Death	The date of the patient's death.	<ul style="list-style-type: none"> ■ A.k.a. DOD. ■ Date of Death received from Vital Records is considered more accurate than other sources of Date of Death. ■ A patient does not have to have a date of death to have a Deceased status.
13	Responsible Party	Entity/Party responsible for an Individual/Patient.	<ul style="list-style-type: none"> ■ Examples are: Parent/Guardian, foster home.
14	Vaccination Encounter	Represents one Patient office visit during which Vaccination Events occurred.	<ul style="list-style-type: none"> ■ During the Vaccination Encounter (office visit) one to several Vaccination Events can be performed (in some cases - no Vaccination Events, e.g., a Patient's refusal of vaccinations).
14.1	VE Date	Date when Vaccination Encounter occurred.	<ul style="list-style-type: none"> ■ Vaccination Encounter date is used to determine which Provider Organization administered the last immunization to a Patient. Vaccination date, not a Submission date, should be used for this purpose. It directly affects PAIS management.
14.2	VE Type	Type of a Vaccination Encounter (office visit)	<ul style="list-style-type: none"> ■ Knowing the type of Vaccination Encounter (office visit) can help determine if PAIS should be changed. <ul style="list-style-type: none"> ■ See "Discussion" section at the end of this appendix for a discussion of acceptable vaccination encounter type. ■ Example: VE Type = mass vaccination clinic
15	Vaccination Event	Vaccination Event is a medical occurrence of administering one Vaccine to a Patient.	<ul style="list-style-type: none"> ■ Several Vaccination Events can happen during one office visit (see Vaccination Encounter).
16	Vaccine	Vaccine is a specific instance of the medicine (instance of the Vaccine Product Type / Vaccine Type) given during a vaccination.	<ul style="list-style-type: none"> ■ Examples: Hib-HbOC, HepB-Hib.
16.1	Vaccine Type	The Vaccine Type is defined as a category of Vaccine.	<ul style="list-style-type: none"> ■ The Vaccine Type may indicate a generic or specific type of vaccine (e.g., pneumococcal or PCV13 or PPSV23). ■ The Vaccine Type can include single types of Vaccines as well as combination vaccines (e.g., IPV or IPV-DTaP-HepB). ■ Examples of Vaccine Type names: HIB-HBOC, HIB-HepB, HepB-Peds.

ID	Name	Description	Remarks
17	Individual-GJ (Geographic Jurisdiction) Responsibility	This is a public health level of responsibility for individuals within a Geographic Jurisdiction.	<ul style="list-style-type: none"> Public health authority (Immunization program) is responsible for Individuals within a Geographic Jurisdiction. Healthcare providers (provider organizations) are responsible for their Patients. For readability, the term Patient in this document may be used instead of the more appropriate term Individual/Patient.
17.1	Patient active/inactive status (PAIS) at Geographic Jurisdiction (GJ) level	PAIS is a ranking term used to describe responsibility for immunization of the individual/patient at a provider organization or geographic jurisdiction level. In other words, PAIS is a designation of the relationship of an individual/patient with a provider organization or the jurisdiction in which the individual/patient resides. PAIS at a geographic jurisdiction level conveys information with respect to the relationship of an individual to a jurisdiction.	<ul style="list-style-type: none"> The Patient active/inactive status is a designation of an individual's/patient's relationship with a provider organization or the jurisdiction in which they reside. PAIS is maintained by IIS. PAIS is directly related to the concept of responsibility for immunization of Patient/Individual. A healthcare Provider Organization is responsible for the immunization of its Patients. The public health authority (on local, state, or federal levels) is responsible for the immunization of the population as a whole within its jurisdiction (or, more precisely, for Individuals that comprise that population). Assignment of an Immunization status to a Patient allows for the establishment of a classification that can be used by parties responsible for immunization for the variety of public health and health care purposes, including immunization coverage assessments, reminder-recall notifications, etc.
18	Patient-PO (Provider Organization) Responsibility	This is a healthcare level of responsibility – for patients associated with a provider organization.	<ul style="list-style-type: none"> Public health authority (Immunization program) is responsible for Individuals within a Geographic Jurisdiction. Healthcare providers are responsible for their Patients. For readability, the term Patient in this document may be used instead of the more appropriate term Individual/Patient. See section “1-1 and 1-M approaches” in Chapter 3 of this document.
18.1	Patient active/inactive status (PAIS) at Provider Organization (PO) level	PAIS is a ranking term used to describe responsibility for immunization of the individual/patient at a provider organization or geographic jurisdiction level. In other words, PAIS is a designation of the relationship of an individual/patient with a provider organization or the jurisdiction in which the individual/patient resides. PAIS at the provider organization level conveys information with respect to the relationship of a patient to a provider organization.	<ul style="list-style-type: none"> The Patient active/inactive status is a designation of an individual's/patient's relationship with a provider organization or the jurisdiction in which they reside. PAIS is assigned and maintained by IIS. PAIS can be changed by a provider organization or IIS. PAIS is directly related to the concept of responsibility for immunization of Patient/Individual. A healthcare Provider Organization is responsible for the immunization of its Patients. The public health authority (on local, state, or federal levels) is responsible for the immunization of the population as a whole within its jurisdiction (or, more precisely, for Individuals that comprise that population). Assignment of an Immunization status to a Patient allows for the establishment of a classification that can be used by parties responsible for immunization for the variety of public health and health care purposes, including immunization coverage assessments, reminder-recall notifications, etc.
19	Report	Report is a reflection of immunization records that documents information about Individuals/Patients and their immunizations.	<ul style="list-style-type: none"> Report can be used for many purposes. Report types include Assessment Report, Report for Reminder-recall (R/R Notification), and other report types. As shown on the domain diagram, a Report is produced for the Population Group/Cohort that is comprised from (made up of) Individuals/Patients. Accordingly, such a Report can contain detailed information on an Individual/Patient included in the Report.

ID	Name	Description	Remarks
20	Assessment Report	Assessment Report is an account of (a document that gives information about) immunizations among a group of Individuals/Patients.	<ul style="list-style-type: none"> ■ Assessment Report (20) is a type of Report (item 19). ■ Assessment Report (e.g., Coverage Assessment report in AFIX) provides a quantitative component of the AFIX assessments. ■ A Coverage Report is just one type of assessment report. A Coverage Report generally reflects the percentage of a population protected from disease. Coverage can be defined as the percentage of the population vaccinated (i.e., would not include people with acquired immunity).
21	R/R Report	Reminder-recall reports or notifications contain a list of one or more individuals/patients with one or more recommended vaccinations for either future or current administration.	<ul style="list-style-type: none"> ■ R/R Report (21) is a type of Report (item 19).
22	Immunization History	Immunization History is a collection of one or more Vaccination Events for a patient. Immunization History describes vaccine doses administered, the dates the doses were administered, associated adverse events (if any), and acquired immunity to disease (if any).	<ul style="list-style-type: none"> ■ Immunization History is a part of Medical History. ■ There are two types of Immunization History: <ul style="list-style-type: none"> ■ IIS Consolidated Immunization History <ul style="list-style-type: none"> ◆ Represents the IIS's consolidated view of the patient's Immunization History ◆ Consolidated from multiple Provider Organizations ◆ Consolidation requires a process which assures that only a single record exists for each Vaccination Event. Refer to MIROW Vaccine-Level Deduplication guide [1.6]. ■ Provider Organization Immunization History <ul style="list-style-type: none"> ◆ Represents the patient Immunization History as known by the Provider Organization ◆ Provider Organization may update patient's Medical History with Immunization History as gathered from IIS.
23	Submission	Collection of one or more descriptions of Vaccination Events and/or demographic information that have been submitted at the same time.	<ul style="list-style-type: none"> ■ Via electronic data exchange (item 3) or direct user interface (item 4). ■ Examples of submissions include direct entry into the UI of one patient's vaccination or demographic information, an entry of a single electronic batch file with thousands of patients and vaccinations, or a single electronic message. ■ Submissions include information about one or more Vaccination Events, Encounters, Patients, Providers. Submission can contain: <ul style="list-style-type: none"> ■ Single Vaccination Event submission ■ Multiple Vaccination Events for a patient encounter (visit) ■ Multiple encounters (visits) for a single patient ■ Multiple patients for a single provider organization ■ Multiple provider organizations ■ Patient Demographic Updates

ID	Name	Description	Remarks
23.1	Submission Date	Submission Date is the date when the data were received (but not necessarily loaded) by the IIS.	<ul style="list-style-type: none"> IIS may delay processing inbound data for reasons including technical problems or system overload.
23.2	Administered/ Historical Indicator	<p>Administered/Historical Indicator describes an association between a Vaccination Event and the organization that originates a Submission for the Vaccination Event: Values: Administered or Historical.</p> <ul style="list-style-type: none"> "Administered" value for the Administered/Historical Indicator points out that the organization records and/or submits its own Vaccination Event (i.e., attests that it conducted the Vaccination Event ["I am Vaccinator"]). "Historical" value for the Administered/Historical Indicator points out that the organization originates a Submission for a Vaccination Event that is owned by some other organization (i.e., attests that it did not conduct the Vaccination Event ["I am NOT Vaccinator"]). 	<ul style="list-style-type: none"> See a detailed discussion of the Administered/Historical Indicator in the MIROW guide [1.1] (pp. 26-27, "Discussion and notes" section in Chapter 3 of that guide). Situations when more than one organization claims to have administered a Vaccination Event should be investigated. If more than one organization reports a historical immunization, this is not a problem, since IIS typically reject duplicates. See MIROW vaccination level deduplication guide [1.5]. <ul style="list-style-type: none"> Example: ALERT IIS (Oregon) flags any potential duplicate immunizations administered within 14 days. If more than one organization claims to have administered the same vaccine on the same day or within a pre-determined timeframe: <ul style="list-style-type: none"> UI: IIS triggers a warning about entering a duplicate vaccine and allows organization to override and enter duplicate dose in the patient record, or EDE: IIS accepts doses submitted electronically and provides submitting organization a potential duplicate vaccine warning. Administered/Historical Indicator is described in the IIS Functional Standards, 2013-2017 (http://www.cdc.gov/vaccines/programs/iis/func-stds.html) with the following IIS Core Data Element: Vaccination Event Information Source (i.e., administered or historical).
24	Contact Method	Method to contact Individual/Patient.	
24.1	Contact Method (CM) Type	Attribute of the Contact Method (item 24).	<ul style="list-style-type: none"> E.g. phone, mail, etc.
24.2	Contact Method (CM) Value	Attribute of the Contact Method (item 24).	<ul style="list-style-type: none"> Valid values varies based on the CM Type
24.3	Contact Method (CM) Primary Indicator	Attribute of the Contact Method (item 24).	<ul style="list-style-type: none"> Yes/no

Table 11. Domain model - terms and definitions (in alphabetical order)

ID	Name	Description	Remarks
23.2	Administered/ Historical Indicator	<p>Administered/Historical Indicator describes an association between a Vaccination Event and the organization that originates a Submission for the Vaccination Event: Values: Administered or Historical.</p> <ul style="list-style-type: none"> ■ “Administered” value for the Administered/Historical Indicator points out that the organization records and/or submits its own Vaccination Event (i.e., attests that it conducted the Vaccination Event [“I am Vaccinator”]). ■ “Historical” value for the Administered/Historical Indicator points out that the organization originates a Submission for a Vaccination Event that is owned by some other organization (i.e., attests that it did not conduct the Vaccination Event [“I am NOT Vaccinator”]). 	<ul style="list-style-type: none"> ■ See a detailed discussion of the Administered/Historical Indicator in the MIROW guide [1.1] (pp. 26-27, “Discussion and notes” section in Chapter 3 of that guide). ■ Situations when more than one organization claims to have administered a Vaccination Event should be investigated. ■ If more than one organization reports a historical immunization, this is not a problem, since IIS typically reject duplicates. See MIROW vaccination level deduplication guide [1.5]. <ul style="list-style-type: none"> ■ Example: ALERT IIS (Oregon) flags any potential duplicate immunizations administered within 14 days. If more than one organization claims to have administered the same vaccine on the same day or within a pre-determined timeframe: <ul style="list-style-type: none"> ◆ UI: IIS triggers a warning about entering a duplicate vaccine and allows organization to override and enter duplicate dose in the patient record, or ◆ EDE: IIS accepts doses submitted electronically and provides submitting organization a potential duplicate vaccine warning. ■ Administered/Historical Indicator is described in the IIS Functional Standards, 2013-2017 (http://www.cdc.gov/vaccines/programs/iis/func-stds.html) with the following IIS Core Data Element: Vaccination Event Information Source (i.e., administered or historical).
20	Assessment Report	<p>Assessment Report is an account of (a document that gives information about) immunizations among a group of Individuals/Patients.</p>	<ul style="list-style-type: none"> ■ Assessment Report (20) is a type of Report (item 19). ■ Assessment Report (e.g., Coverage Assessment report in AFIX) provides a quantitative component of the AFIX assessments. ■ A Coverage Report is just one type of assessment report. A Coverage Report generally reflects the percentage of a population protected from disease. Coverage can be defined as the percentage of the population vaccinated (i.e., would not include people with acquired immunity).
24	Contact Method	Method to contact Individual/Patient.	
24.2	Contact Method (CM) Value	Attribute of the Contact Method (item 24).	<ul style="list-style-type: none"> ■ Valid values varies based on the CM Type
24.3	Contact Method (CM) Primary Indicator	Attribute of the Contact Method (item 24).	<ul style="list-style-type: none"> ■ Yes/no
24.1	Contact Method (CM) Type	Attribute of the Contact Method (item 24).	<ul style="list-style-type: none"> ■ E.g. phone, mail, etc.

ID	Name	Description	Remarks
12.1	Date of Birth	The birth date of the patient.	<ul style="list-style-type: none"> ■ A.k.a. DOB. ■ Date of Birth received from Vital Records is considered more accurate than other sources of Date of Birth.
12.2	Date of Death	The date of the patient's death.	<ul style="list-style-type: none"> ■ A.k.a. DOD. ■ Date of Death received from Vital Records is considered more accurate than other sources of Date of Death. ■ A patient does not have to have a date of death to have a Deceased status.
3	Electronic Data Exchange	Electronic Data Exchange is the interface in which data can be communicated electronically between a third party system (e.g., provider organization's system) and the IIS.	<ul style="list-style-type: none"> ■ Examples of third party systems are: EHR, HIE, and Billing systems. ■ "There is no commonly understood distinction between the concepts of an electronic health record and an electronic medical record, and no such distinction has been made uniformly in the literature." -- Alan R. Hinman and David A. Ross. Immunization Registries Can Be Building Blocks For National Health Information Systems. HEALTH AFFAIRS 29, NO. 4 (2010): 676–682. ■ <i>For the purposes of this project, the term "EHR system" will be used to refer to both EHR and EMR systems.</i> ■ HL7 is a standard used for exchanging immunization information with IIS [2.5].
7	Geographic Jurisdiction	The Geographic Jurisdiction could be a State, a metropolitan area (New York City, Chicago, etc.), a county within a State, or some other subdivision of a larger Geographic Jurisdiction.	<ul style="list-style-type: none"> ■ A jurisdiction might encompass the entire country, as is the case with nationwide jurisdictions such as the jurisdictions of the Veterans Administration ("non-geographic jurisdiction"). ■ Types of Geographic Jurisdiction include state, city, and county, as well as Other Geographic Area (the term was introduced since a "pocket of need" could be for a geographic area other than an official "jurisdiction").
4	IIS Direct User Interface (Direct UI)	This is the application for the user to submit data directly to or retrieve data directly from the IIS; usually accessed via the Web.	<ul style="list-style-type: none"> ■ User interface, although not entirely error-free, is an opportunity for human evaluation and decision. ■ Throughout the document, this term is referenced in abbreviated forms as IIS Direct UI, Direct UI, or UI.
22	Immunization History	Immunization History is a collection of one or more Vaccination Events for a patient. Immunization History describes vaccine doses administered, the dates the doses were administered, associated adverse events (if any), and acquired immunity to disease (if any).	<ul style="list-style-type: none"> ■ Immunization History is a part of Medical History. ■ There are two types of Immunization History: <ul style="list-style-type: none"> ■ IIS Consolidated Immunization History <ul style="list-style-type: none"> ◆ Represents the IIS's consolidated view of the patient's Immunization History ◆ Consolidated from multiple Provider Organizations ◆ Consolidation requires a process which assures that only a single record exists for each Vaccination Event. Refer to MIROW Vaccine-Level Deduplication guide [1.6]. ■ Provider Organization Immunization History <ul style="list-style-type: none"> ◆ Represents the patient Immunization History as known by the Provider Organization ◆ Provider Organization may update patient's Medical History with Immunization History as gathered from IIS.

ID	Name	Description	Remarks
2	Immunization Information System (IIS)	Immunization information systems (IIS) are confidential, population-based, computerized databases that record all immunization doses administered by participating providers to persons residing within a given geopolitical area.	<ul style="list-style-type: none"> At the point of clinical care, an IIS can provide consolidated immunization histories for use by a vaccination provider in determining appropriate client vaccinations. At the population level, an IIS provides aggregate data on vaccinations for use in surveillance and program operations, and in guiding public health action with the goals of improving vaccination rates and reducing vaccine-preventable disease. See http://www.cdc.gov/vaccines/programs/iis/about.html.
1	Immunization Program	Immunization Program at the level of CDC awardee (i.e., at the state, city, or territory)	<ul style="list-style-type: none"> Vaccines for Children (VFC) program [2.4]. The VFC program is a federally funded program that provides vaccines at no cost to children who might not otherwise be vaccinated because of inability to pay. The VFC program is implemented on federal, awardee, and provider organization levels. Assessment, Feedback, Incentives, eXchange - AFIX [2.2]. The AFIX approach used by CDC awardees, incorporates strategies to improve provider organizations' immunization service delivery and raise vaccination coverage levels.
11	Individual	A person. Individuals comprise a Population.	<ul style="list-style-type: none"> A Patient is "a type of" Individual. Every Patient is an Individual, but not every Individual is a Patient.
17	Individual-GJ (Geographic Jurisdiction) Responsibility	This is a public health level of responsibility for individuals within a Geographic Jurisdiction.	<ul style="list-style-type: none"> Public health authority (Immunization program) is responsible for Individuals within a Geographic Jurisdiction. Healthcare providers (provider organizations) are responsible for their Patients. For readability, the term Patient in this document may be used instead of the more appropriate term Individual/Patient.
12	Patient	An Individual who is the actual or potential recipient of a dose of Vaccine from a Provider Organization.	<ul style="list-style-type: none"> Every Patient is an Individual, but not every Individual is a Patient. For purposes of Data Quality, Patients are assumed to be deduplicated. Refer to the guidelines on patient-level deduplication (http://www.immregistries.org/resources/iis-meetings/Fred_Grant_AIRA_De-Duplication_Presentation.pdf). Provider Organizations may report Patient demographic information without Vaccination Event information.
17.1	Patient active/inactive status (PAIS) at Geographic Jurisdiction (GJ) level	PAIS is a ranking term used to describe responsibility for immunization of the individual/patient at a provider organization or geographic jurisdiction level. In other words, PAIS is a designation of the relationship of an individual/patient with a provider organization or the jurisdiction in which the individual/patient resides. PAIS at a geographic jurisdiction level conveys information with respect to the relationship of an individual to a jurisdiction.	<ul style="list-style-type: none"> The Patient active/inactive status is a designation of an individual's/patient's relationship with a provider organization or the jurisdiction in which they reside. PAIS is maintained by IIS. PAIS is directly related to the concept of responsibility for immunization of Patient/Individual. A healthcare Provider Organization is responsible for the immunization of its Patients. The public health authority (on local, state, or federal levels) is responsible for the immunization of the population as a whole within its jurisdiction (or, more precisely, for Individuals that comprise that population). Assignment of an Immunization status to a Patient allows for the establishment of a classification that can be used by parties responsible for immunization for the variety of public health and health care purposes, including immunization coverage assessments, reminder-recall notifications, etc.

ID	Name	Description	Remarks
18.1	Patient active/inactive status (PAIS) at Provider Organization (PO) level	PAIS is a ranking term used to describe responsibility for immunization of the individual/patient at a provider organization or geographic jurisdiction level. In other words, PAIS is a designation of the relationship of an individual/patient with a provider organization or the jurisdiction in which the individual/patient resides. PAIS at the provider organization level conveys information with respect to the relationship of a patient to a provider organization.	<ul style="list-style-type: none"> ■ The Patient active/inactive status is a designation of an individual's/patient's relationship with a provider organization or the jurisdiction in which they reside. ■ PAIS is assigned and maintained by IIS. PAIS can be changed by a provider organization or IIS. ■ PAIS is directly related to the concept of responsibility for immunization of Patient/Individual. A healthcare Provider Organization is responsible for the immunization of its Patients. The public health authority (on local, state, or federal levels) is responsible for the immunization of the population as a whole within its jurisdiction (or, more precisely, for Individuals that comprise that population). Assignment of an Immunization status to a Patient allows for the establishment of a classification that can be used by parties responsible for immunization for the variety of public health and health care purposes, including immunization coverage assessments, reminder-recall notifications, etc.
18	Patient-PO (Provider Organization) Responsibility	This is a healthcare level of responsibility – for patients associated with a provider organization.	<ul style="list-style-type: none"> ■ Public health authority (Immunization program) is responsible for Individuals within a Geographic Jurisdiction. Healthcare providers are responsible for their Patients. For readability, the term Patient in this document may be used instead of the more appropriate term Individual/Patient. ■ See section “1-1 and 1-M approaches” in Chapter 3 of this document.
9	Place of Residence (PoR)	A place where Individual/Patient resides.	<ul style="list-style-type: none"> ■ Individual/Patient can have more than one Place of Residence.
5.2	PO Location/ Address	The address of the Provider Organization.	<ul style="list-style-type: none"> ■ Possible fields to include with address are city, state, county, country, zip code, telephone number, and jurisdiction.
5.1	PO Type/Sub-Type	Describes a combination of population groups and services provided by the Provider Organization.	<ul style="list-style-type: none"> ■ Knowing the type of practice can help determine if patient can be associated with this practice as an “active” patient. <ul style="list-style-type: none"> ■ See “Discussion” section at the end of this appendix for a discussion of acceptable provider organization type. ■ May be sufficient to assign only the type (e.g., Specialty Provider); in these cases, the sub-type is not needed. ■ Example: <ul style="list-style-type: none"> ■ Type = Specialty Provider, Sub-type = OB/GYN ■ Type = Hospital, Sub-type = ER ■ There could be multiple layers to one Provider Organization (e.g., family practice may be also OB/GYN).
10	Population Group / Cohort	A group of individuals who share a common characteristic (e.g., age); part of the population within a Geographic Jurisdiction.	<ul style="list-style-type: none"> ■ Webster: “A group of individuals having a statistical factor (as age or class membership) in common in a demographic study <a cohort of premedical students>.” ■ Wiki: “A cohort is a group of people who share a common characteristic or experience within a defined period (e.g., are born, are exposed to a drug or vaccine or pollutant, or undergo a certain medical procedure).”

ID	Name	Description	Remarks
9.1	PoR Address	The address of the Place of Residence	<ul style="list-style-type: none"> ■ Data elements include: number, street, city, zip or postal code, state, and county or public health entity area of responsibility. ■ PO Box addresses should be accepted and utilized by IIS in the same way as street addresses. ■ Some HL7 submissions have no patient address. Such submissions should be accepted by IIS and patient should be considered residing within the Geographic Jurisdiction until proven otherwise (i.e., error on the side of inclusion); see BR412 ■ IIS may capture historical addresses as well as current address. ■ It is beneficial to store 1 physical address plus 1 mailing address plus all historical addresses.
5	Provider Organization	Provider Organization is an organization that provides vaccination services or is “accountable” for an entity which provides vaccination services.	<ul style="list-style-type: none"> ■ Provider Organizations include a collection of related Providers (e.g., clinicians – physicians, nurses).
21	R/R Report	Reminder-recall reports or notifications contain a list of one or more individuals/patients with one or more recommended vaccinations for either future or current administration.	<ul style="list-style-type: none"> ■ R/R Report (21) is a type of Report (item 19).
19	Report	Report is a reflection of immunization records that documents information about Individuals/Patients and their immunizations.	<ul style="list-style-type: none"> ■ Report can be used for many purposes. Report types include Assessment Report, Report for Reminder-recall (R/R Notification), and other report types. ■ As shown on the domain diagram, a Report is produced for the Population Group/ Cohort that is comprised from (made up of) Individuals/Patients. Accordingly, such a Report can contain detailed information on an Individual/Patient included in the Report.
13	Responsible Party	Entity/Party responsible for an Individual/ Patient.	<ul style="list-style-type: none"> ■ Examples are: Parent/Guardian, foster home.
23	Submission	Collection of one or more descriptions of Vaccination Events and/or demographic information that have been submitted at the same time.	<ul style="list-style-type: none"> ■ Via electronic data exchange (item 3) or direct user interface (item 4). ■ Examples of submissions include direct entry into the UI of one patient’s vaccination or demographic information, an entry of a single electronic batch file with thousands of patients and vaccinations, or a single electronic message. ■ Submissions include information about one or more Vaccination Events, Encounters, Patients, Providers. Submission can contain: <ul style="list-style-type: none"> ■ Single Vaccination Event submission ■ Multiple Vaccination Events for a patient encounter (visit) ■ Multiple encounters (visits) for a single patient ■ Multiple patients for a single provider organization ■ Multiple provider organizations ■ Patient Demographic Updates

ID	Name	Description	Remarks
23.1	Submission Date	Submission Date is the date when the data were received (but not necessarily loaded) by the IIS.	<ul style="list-style-type: none"> IIS may delay processing inbound data for reasons including technical problems or system overload.
14	Vaccination Encounter	Represents one Patient office visit during which Vaccination Events occurred.	<ul style="list-style-type: none"> During the Vaccination Encounter (office visit) one to several Vaccination Events can be performed (in some cases - no Vaccination Events, e.g., a Patient's refusal of vaccinations).
15	Vaccination Event	Vaccination Event is a medical occurrence of administering one Vaccine to a Patient.	<ul style="list-style-type: none"> Several Vaccination Events can happen during one office visit (see Vaccination Encounter).
16	Vaccine	Vaccine is a specific instance of the medicine (instance of the Vaccine Product Type / Vaccine Type) given during a vaccination.	<ul style="list-style-type: none"> Examples: Hib-HbOC, HepB-Hib.
16.1	Vaccine Type	The Vaccine Type is defined as a category of Vaccine.	<ul style="list-style-type: none"> The Vaccine Type may indicate a generic or specific type of vaccine (e.g., pneumococcal or PCV13 or PPSV23). The Vaccine Type can include single types of Vaccines as well as combination vaccines (e.g., IPV or IPV-DTaP-HepB). Examples of Vaccine Type names: HIB-HBOC, HIB-HepB, HepB-Peds.
14.1	VE Date	Date when Vaccination Encounter occurred.	<ul style="list-style-type: none"> Vaccination Encounter date is used to determine which Provider Organization administered the last immunization to a Patient. Vaccination date, not a Submission date, should be used for this purpose. It directly affects PAIS management.
14.2	VE Type	Type of a Vaccination Encounter (office visit)	<ul style="list-style-type: none"> Knowing the type of Vaccination Encounter (office visit) can help determine if PAIS should be changed. <ul style="list-style-type: none"> See "Discussion" section at the end of this appendix for a discussion of acceptable vaccination encounter type. Example: VE Type = mass vaccination clinic

Discussion notes regarding selected terms

Acceptable provider organization type

(see item 5.1 in the table of terms and definitions above)

- “Provider organization of an acceptable type” is shorthand for “Acceptable Provider Organization Type for Reminder-recalls or Assessments.” In other words, the provider organization type should be considered acceptable if it may conduct reminder-recall (RR) or assessment reports for a patient.
- Note that acceptable provider organization type may vary according to the age of the patient. It also can change over time (e.g., a pharmacy chain might not be of an acceptable provider organization type now, but would become “acceptable” later as it starts to provide more comprehensive vaccination services).
- The group came to the decision that it is best practice not to change PAIS if the provider organization type is not acceptable.
- Which provider organization types are acceptable vary by IIS given different, varying needs and approaches to reminder-recalls and assessments.
- Provider organizations are evolving, with some now posing the need, and sometimes desire, to participate in RR or assessment reports. For example:
 - Some schools are requesting assessment reports.
 - Some pharmacies are working with VFC, some request assessments, some are starting to provide vaccines other than influenza vaccine.
 - ◆ “We do not know how large their role in immunizations will be in the next 5 years.”
 - Some pharmacies are currently upselling using their internal inventory systems to approximate R/R outside of the formal R/R process.
 - In the future, with impact of the Affordable Care Act, physicians may not carry some expensive vaccines even if their patients have insurance. Thus, patients may have to go to another physician for vaccinations.
- As IISs mature, their needs and approaches are also changing in regard to RR and assessments.
- The question was raised of how specialty doctors (e.g., a gastrointestinal specialist) would be handled.
- Ultimately, the group decided it depended on how the individual IIS categorized the Provider Organization Type as acceptable or not.
- In addition, it was decided that acceptable Provider Organization Types could vary by the age of the patient. For example, a pharmacy may be unacceptable for a child, but acceptable for adolescents and adults.
- Some of this is dictated by local laws and mandates.
- Note that even if the provider organization type is not of an acceptable type, the patient will be covered for RR and assessments within a geographic jurisdiction based on their place of residence.

Acceptable vaccination encounter type

(see item 14.2 in the table of terms and definitions above)

- Vaccination Encounter Type (e.g., special event) should impact PAIS, but only whether event is a mass vaccination or not.
- Regarding mass vaccination events: Currently, the IIS is unlikely to know about the majority of these types and will not be able to make judgments based on it. However, sometimes the IIS does know about mass vaccination type events. In these cases, an IIS creates alternative modes of entry or special provider organizations or events to capture these separately from standard well visits (e.g., Nevada creates special input screens).
- Examples which could be considered mass vaccinations:
 - H1N1
 - Flu only clinics
 - Tdap provided in schools
 - Bundled influenza over a period of days
 - Walk-in treatment centers with one-time events
- Each IIS has unique ways to get around not associating special events. That is why it is left up to the IIS.
- The group ultimately agreed that Vaccination Encounter type of immunization event was a major factor in determining whether to establish an active PAIS.
- However, the group also noted that currently there is no easy way to obtain this information. It is deduced based on knowledge and experience of the IIS and communication with provider organizations.

Principal Provider Organization – Immunization Home

- Principal Provider Organization (formerly referred to as Immunization Home in the 2005 MOGE guide [1.7, p. 29]) is a term that can be used to describe exclusive/sole association between a Patient and a Provider Organization. A Patient can have an active status with many Provider Organizations, but only one Provider Organization would be considered as the Principal Provider Organization.
- See Chapter 5, section “[Discussion of the Assessment Report at the Provider Organization level](#)” of this document for a possible implementation of the Principal Provider Organization concept with the 1-M approach.
- Ultimately the MIROW panel of experts decided that the concept of Principal Provider Organization was not necessary at this time. Therefore, this term was not included in the domain model (vocabulary, list of terms and definitions).

Appendix B: Comparison of statuses with 2005 MOGE guide

This section illustrates changes to patient active/inactive statuses introduced in this document compared to the 2005 MIROW guide “Management of Moved or Gone Elsewhere (MOGE) Status and other Patient Designations in Immunization Information Systems” [1.7]. Note that this document replaces the 2005 guide.

Table 12. Comparison of statuses with 2005 MOGE guide

Statuses	This Guide	2005 MOGE Guide [1.7]
Statuses overview		
Nomenclature of immunization statuses for a patient at the provider organization level	<ul style="list-style-type: none"> ■ Active: BR402A, BR402B ■ Inactive, with the following reason codes: <ul style="list-style-type: none"> ■ No longer a patient: BR404A, BR404B ■ Lost to follow-up: BR405 ■ Unspecified: BR406 ■ Deceased: BR421 	<ul style="list-style-type: none"> ■ Active ■ Inactive - Permanently ■ Inactive - MOGE ■ Inactive - Lost to follow up ■ Inactive - Unspecified ■ Unknown
Nomenclature of immunization statuses for an individual at the geographic jurisdiction level	<ul style="list-style-type: none"> ■ Active: BR412 ■ Inactive, with the following reason codes: <ul style="list-style-type: none"> ■ Outside jurisdiction: BR413 ■ Unknown, with the following reason codes: <ul style="list-style-type: none"> ■ No address - no vaccination: BR414 ■ No activity for extended period of time: BR415 ■ Deceased: BR421 	<ul style="list-style-type: none"> ■ Active ■ Inactive - Permanently ■ Inactive - MOGE ■ Inactive - Lost to follow up ■ Unknown

Statuses	This Guide	2005 MOGE Guide [1.7]
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Detailed status by status comparison (see Table 1 in the 2005 guide [1.7]).
Reference remarks for BRs in this document for additional considerations.

Active status at the provider organization level	<p>BR402A For the 1-1 approach, patient status with a provider organization should be considered “active” only if the provider organization is of an acceptable type and any of the following is true:</p> <ul style="list-style-type: none"> ■ Provider organization directly identifies the individual as a patient. ■ Provider organization indirectly identifies the individual as a patient: <ul style="list-style-type: none"> ■ Provider organization has conducted the most recent vaccination event during the vaccination encounter of an acceptable type for the patient. ■ Provider organization has created new patient’s record in IIS (i.e., submitted or entered patient’s demographic-only information or historical-only immunization information for a patient not already in IIS). <p>BR402B For the 1-M approach, patient status with a provider organization should be considered “active” only if the provider organization is of an acceptable type and any of the following is true:</p> <ul style="list-style-type: none"> ■ Provider organization directly identifies the individual as a patient. ■ Provider organization indirectly identifies individual as a patient in any of the following ways: <ul style="list-style-type: none"> ■ Provider organization conducted a vaccination event during a vaccination encounter of an acceptable type for the patient. ■ Provider organization has created new or updated an existing patient’s record in IIS (i.e., submitted or entered patient’s demographic-only information or historical-only immunization information for a patient) 	<p>Active BR18: An individual who</p> <ul style="list-style-type: none"> a. has received an immunization from a provider, or b. whom a health plan has identified as a patient of a provider, or c. a provider has identified as a patient, or d. other medical information has identified as a patient of a provider. <p>BR10: If an immunization given by a provider is reported to the registry, or If a provider identifies a child as a patient, or If a health plan identifies a child as a patient, or If other medical information identifies a child as patient, then a patient’s provider status is set to active.</p>
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Statuses	This Guide	2005 MOGE Guide [1.7]
<p>Inactive status at the provider organization level, with the reason code "No longer a patient"</p>	<p>BR404A For the 1-1 approach, patient status at the provider organization level should be considered "inactive" with the reason code "No longer a patient" only if any of the following is true:</p> <ul style="list-style-type: none"> ■ Relationship between a provider organization and a patient has been terminated by either party, for example: <ul style="list-style-type: none"> ■ Patient has gone/transferred to another provider organization ■ Patient has moved out of the area ■ Patient has received a more recent immunization from another provider organization <p>BR404B For the 1-M approach, patient status at the provider organization level should be considered "inactive" with the reason code "No longer a patient" only if any of the following is true:</p> <ul style="list-style-type: none"> ■ Relationship between a provider organization and a patient has been terminated by either party, for example: <ul style="list-style-type: none"> ■ Patient has gone/transferred to another provider organization ■ Patient has moved out of the area 	<p>Inactive - MOGE BR19: There is documentation that one of the following has occurred:</p> <ul style="list-style-type: none"> a. a patient has moved out of immediate area b. a patient has gone to another practice c. a patient has moved with no forwarding address. <p>BR13: If a reminder-recall notification has been returned with a forwarding address out of the immediate area, or If a request to transfer a patient's medical records has been received, or If a notification of intent to get immunizations elsewhere is received from the parent or guardian, or If a patient has moved with no forwarding address, then the patient's status should be set to Inactive - MOGE.</p> <p>BR17: If a patient's status with a provider is unknown or inactive-lost to follow-up or inactive-unspecified and the registry determines the patient is receiving immunizations elsewhere, then the patient's status with that first provider should be set to Inactive-MOGE.</p>
<p>Inactive status at the provider organization level, with the reason code "Lost to follow-up"</p>	<p>BR405 Patient status at the provider organization level should be considered "inactive" with the reason code "Lost to follow-up" only if any of the following is true:</p> <ul style="list-style-type: none"> ■ Attempts to contact individual have been documented but no documented response has been received ■ Provider organization has no means to contact patient, e.g. no address, no cell phone 	<p>Inactive - Lost to follow up BR30: Attempts to contact an individual have been documented but there is no documented response received, or there is inadequate contact information for the individual.</p> <p>BR14: If documented attempts have been made to locate and/or contact a patient and no response has been received, then the patient's status should be set to inactive lost to follow up.</p>
<p>Inactive status at the provider organization level, with the reason code "Unspecified"</p>	<p>BR406 Patient status at the provider organization level should be considered "inactive" with the reason code "Unspecified" only if patient's information has been submitted to an IIS via an electronic interface (EDE) with the inactive status without a reason code being specified.</p>	<p>Inactive-Unspecified BR20: A provider has determined that a patient is no longer active for immunization purposes but did not specify a reason.</p> <p>BR16: If a provider considers a patient inactive and does not wish to specify a reason, then the provider may set the patient's status to inactive unspecified.</p>

Statuses	This Guide	2005 MOGE Guide [1.7]
Unknown status at the provider organization level	N/A: there is no “unknown” status defined at the provider organization level	<p>Unknown</p> <p>BR21: A patient has been made known to a registry via an electronic interface without status being specified.</p> <p>BR11: If patient provider information is received via electronic interface with no status, then the patient’s provider status is set to unknown.</p>
Deceased status at the provider organization and geographic jurisdiction levels	<p>BR421</p> <p>Patient status at the provider organization and geographic jurisdiction levels should be considered “inactive” with the reason code “Deceased” only if a patient’s death is confirmed.</p>	<p>Inactive - Permanently</p> <p>BR31: Patient is deceased.</p> <p>BR15: If a patient’s death is confirmed, then set the patient’s status to permanently inactive.</p>
Active status at the geographic jurisdiction level	<p>BR412</p> <p>Individual status with a geographic jurisdiction should be considered “active” only if any of the following is true:</p> <ul style="list-style-type: none"> ■ Individual residence within the geographic jurisdiction has been confirmed. ■ Individual received an immunization from a provider organization within the geographic jurisdiction and individual’s address is not known (<i>this condition applies only to highest level geographic jurisdiction, such as state or city</i>). 	<p>Active</p> <p>BR28: An individual whose residence within the geographic jurisdiction has been documented (established).</p> <p>BR24: If residence within jurisdiction reported, then the patient’s status should be set to active.</p> <p>BR25: If a new record of residence within a jurisdiction is received, then the patient’s status should be set to active.</p> <p>BR26: If an immunization event has been received and either there was no address or the address was within the jurisdiction, then the patient’s status should be set to active.</p>
Inactive status at the geographic jurisdiction level, with the reason code “Outside jurisdiction”	<p>BR413</p> <p>Individual status at the geographic jurisdiction level should be considered “inactive” with the reason code “Outside jurisdiction” only if the individual does not reside in the geographic jurisdiction.</p>	<p>Inactive - MOGE</p> <p>BR29: Documentation exists that the individual no longer resides in the geographic jurisdiction.</p> <p>BR27: If documentation exists that an individual no longer resides in a jurisdiction, then the patient’s status for that jurisdiction should be set to inactive MOGE.</p>
Inactive status at the geographic jurisdiction level, with the reason code “Lost to follow-up”	N/A: there is no “inactive” status with the reason code “Lost to follow-up” defined at the geographic jurisdiction level.	<p>Inactive - Lost to follow up</p> <p>BR30: Attempts to contact an individual have been documented but there is no documented response received, or there is inadequate contact information for the individual.</p> <p>BR14: If documented attempts have been made to locate and/or contact a patient and no response has been received, then the patient’s status should be set to inactive lost to follow up.</p>

Statuses	This Guide	2005 MOGE Guide [1.7]
Unknown status at the geographic jurisdiction level, with the reason code "No address - no vaccination"	<p><u>BR414</u> Individual status at the geographic jurisdiction level should be considered "unknown" with the reason code "No address – no vaccination" only if the IIS has never received an address and has never received vaccination information about the individual.</p>	<p>N/A Excerpt from Active: BR26: If an immunization event has been received and either there was no address or the address was within the jurisdiction, then the patient's status should be set to active.</p>
Unknown status at the geographic jurisdiction level, with the reason code "No activity for extended period of time"	<p><u>BR415</u> Individual status at the geographic jurisdiction level should be considered "unknown" with the reason code "No activity for extended period of time" only if the IIS has not received demographic and/or immunization information for an individual for an extended period of time.</p>	<p>Unknown BR32: An individual at least 7 years of age with no documented immunizations after their birth dose, OR An individual for whom no contact or event (vaccination, change to the record, etc.) has been documented in their record for 10 years. BR22: If no record of immunizations beyond birth have been recorded for 7 years AND there have been no updates to an individual's record during that time, then the individual's status should be set to unknown. BR23: If there have been no changes to an individual's record for 10 years after the last contact recorded in the record, then the patient's status should be set to unknown.</p>



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