Connections That Count

From Interface Integration to Error Investigation

Presented by:
Samantha Robbins, IIS Interoperability Specialist
Jonathan Lundquist, Data Quality Specialist

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- Define onboarding

- Outline the benefits of onboarding

- Review onboarding stats in the WyIR

- Outline data quality analysis

- Review the standard for data quality in the WyIR

- Learn how to request an interface connection

- Review the onboarding process

- Provider Detail Error Reports

- Interpreting Provider Detail Error Reports

- Discuss "Do's" and "Don'ts"
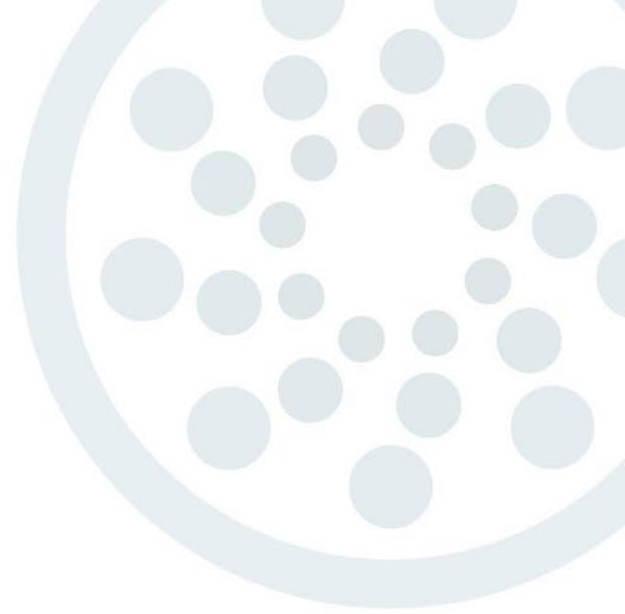
Definitions

Definitions

Health Level 7 (HL7): a set of standards, formats and definitions for exchanging and developing electronic health records (EHRs)

Immunization Information System (IIS): are confidential, population-based, computerized databases that record all immunization doses administered by participating providers to persons residing within a given geographical area

Wyoming Immunization Registry (WyIR): a confidential, cloud-based database that contains electronic vaccination records of vaccines administered in Wyoming. This is the Wyoming IIS

Query: a request for information from a database management system

Definitions - Continued

Interoperability: the secure and timely access, integration, and use of electronic health data

Data: facts and statistics collected together for reference or analysis

Interface: establishes a physical connection between two computer systems

Electronic Medical/Health Record (EHR): are real-time, patient-centered records that make information available instantly and securely to authorized users

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Onboarding: What is it?

- Process of completing steps to ensure good data quality when connecting a facility's Electronic Health Record interface to the WyIR
- This connection, also called an "interface connection" allows providers to enter a patient's data once, into the EHR, for it to also be copied to the WyIR
- Without an interface connection, providers must enter patient vaccine data twice, once into the patient's EHR and once into the WyIR to maintain compliance with Wyoming's mandatory reporting requirement

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Interface Connections

There are 3 types of interface connections the WyIR supports:

- Bi-directional (preferred): These are connections that both submit data to the WyIR, but also provide responses to queries sent to the WyIR, including immunization status and patient demographics
- Reporting only: These connections only report data to the WyIR from an EHR.
- Query only: These connections only provide responses to queries sent to the WyIR

Benefits of Onboarding

- Reduce reporting burden, reporting time and evaluate data quality

- Report data in real-time

- Report data to an EHR and the WyIR simultaneously

- Report standardized and concise data

- Search patient immunization history through the EHR

Onboarding Statistics

Current WyIR Interface Connection Stats

94	358	1	37
Number of organizations currently onboarded	Number of facilities currently onboarded	Number of organizations in testing	Number of facilities onboarded since June 2024

🙂 **There is no longer a waitlist to onboard!** 🙂

HL7 Message Volume

Volume of HL7 Messages in Current Period of Performance:						
2024 Month	July	Aug	Sep	Oct	Nov	Dec
Volume	232,553	262,894	257,035	325,920	265,151	235,229
2025 Month	Jan	Feb	Mar	Apr	May	Jun
Volume	331,869	267,451	200,694	263,978	294,822	
Total to Date	2,937,596 messages					

98.45% of messages were successful or free of errors or warnings since July 1, 2024 - March 2025: Outstanding!

Interface Connections and Data Quality

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Interface Provider Detail Error Reports (PDER) help identify errors and bad data in data exchange.

Provider	Representative Facility ID	User	Profile	Import Log ID	Error / Warn	Date Sent	MRN	Issue
******	SIISCLIENT****	HL7-******	388	********	E	5/2/24 16:46	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	388	********	E	5/12/24 6:50	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	388	********	E	5/17/24 10:40	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	388	********	E	5/17/24 10:41	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	388	********	E	5/9/24 14:34	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	388	********	E	5/24/24 16:03	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	388	********	W	5/2/24 10:26	**********	Patient phone of usecode PRN is
******	SIISCLIENT****	HL7-******	388	********	W	5/6/24 14:05	**********	Patient phone of usecode PRN is
******	SIISCLIENT****	HL7-******	388	********	E	5/18/24 15:20	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	388	********	W	5/18/24 15:20	**********	Patient phone of usecode PRN is
******	SIISCLIENT****	HL7-******	390	********	W	5/6/24 19:50	**********	patient address city is missing
******	SIISCLIENT****	HL7-******	390	********	W	5/6/24 19:50	**********	patient address state is missing
******	SIISCLIENT****	HL7-******	390	********	W	5/6/24 19:50	**********	patient address street is missing
******	SIISCLIENT****	HL7-******	390	********	W	5/6/24 19:50	**********	patient address zip is missing
******	SIISCLIENT****	HL7-******	594	********	E	5/8/24 16:15	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	594	********	E	5/10/24 18:15	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	594	********	E	5/14/24 14:15	**********	First name required - Message Re
******	SIISCLIENT****	HL7-******	594	********	E	5/14/24 14:15	**********	patient first name is invalid
******	SIISCLIENT****	HL7-******	594	********	E	5/24/24 18:15	**********	vaccination vfc status is missing -
******	SIISCLIENT****	HL7-******	594	********	E	5/31/24 16:15	**********	patient first name is invalid

CDC IIS Data Quality Blueprint

The foundation for data in the WyIR is based upon the CDC's IIS Data Quality Blueprint.

CDC IIS Data Quality Blueprint - Available

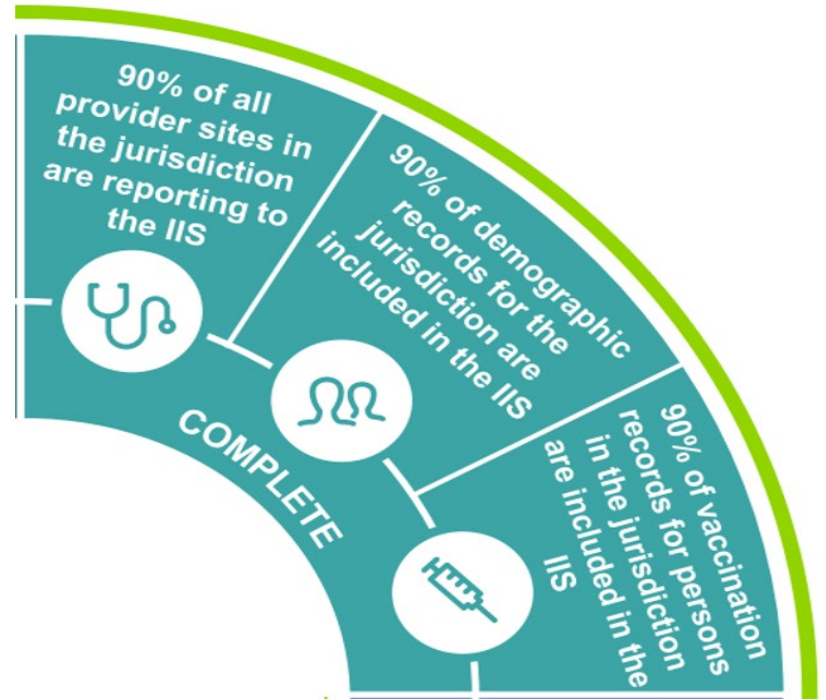Immunization program staff have the ability to query IIS data for coverage reports and answering ad-hoc questions

AVAILABLE

When data is available in the WyIR, it means that it is accessible and able to be used to meet programmatic and operation needs of WyIR users. This includes WyIR authorized users pulling reports and the Immunization Unit assessing and analyzing data for use.

CDC IIS Data Quality Blueprint - Complete

- 90% of all provider sites, demographic records and vaccination records are included in the IIS database
- Interface connections require certain data elements in order to be successful. This data includes vaccination information and patient demographics
- With this data, the WyIR is able to meet the "complete" benchmark of the IIS Data Quality Blueprint

90% of all provider sites in the jurisdiction are reporting to the IIS

90% of demographic records for the jurisdiction are included in the IIS

90% of vaccination records for persons in the jurisdiction are included in the IIS

COMPLETE

CDC IIS Data Quality Blueprint - Valid

100% of patient addresses are validated using external sources

VALID

100% of routine age-based vaccines in the IIS are evaluated and forecasted in alignment with ACIP recommendations

By receiving data in a timely manner through an interface connection, available records can be used for clinical decision making and immunization forecasting in the WyIR.

CDC IIS Data Quality Blueprint - Timely

- 95% of vaccination events and birth records are created in the IIS database between 1 and 30 days
- With most interfaces reporting to the WyIR in real-time, vaccination events and patient records are able to be reported in a timely manner
- Newborn records can be reported via an interface connection to create a new patient record in the WyIR


TIMELY

95% of vaccination events are recorded in the IIS within 1 day

95% of birth records are created in the IIS within 30 days of the patient's birth

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Requesting an Interface Connection

Requesting an Interface Connection

1. An organization will contact the WyIR Help Desk expressing interest in establishing an interface connection with the WyIR.

1. A request for an interface connection cannot be initiated by the EHR vendor. If an EHR vendor contacts the WyIR Help Desk or Immunization Unit on behalf of an organization the request will be deferred to the organization's WyIR contacts.

1. An "onboarding invitation" template email will be sent to the requesting provider. This email informs the provider of the requirement to complete the following forms which can be accessed on the Immunization Unit website.

    a. WyIR Onboarding Questionnaire
    b. WyIR Onboarding Registration Form

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Requesting an Interface Connection   - Continued

4. Providers are required to complete the questionnaire and registration forms. Information for every location that will be included in the interface connection should be provided on the required forms.
- Completion of these forms is very important to ensure a seamless and correct interface connection. Once the requesting provider has completed the WyIR Onboarding Questionnaire and Registration, a kick-off call will be scheduled.
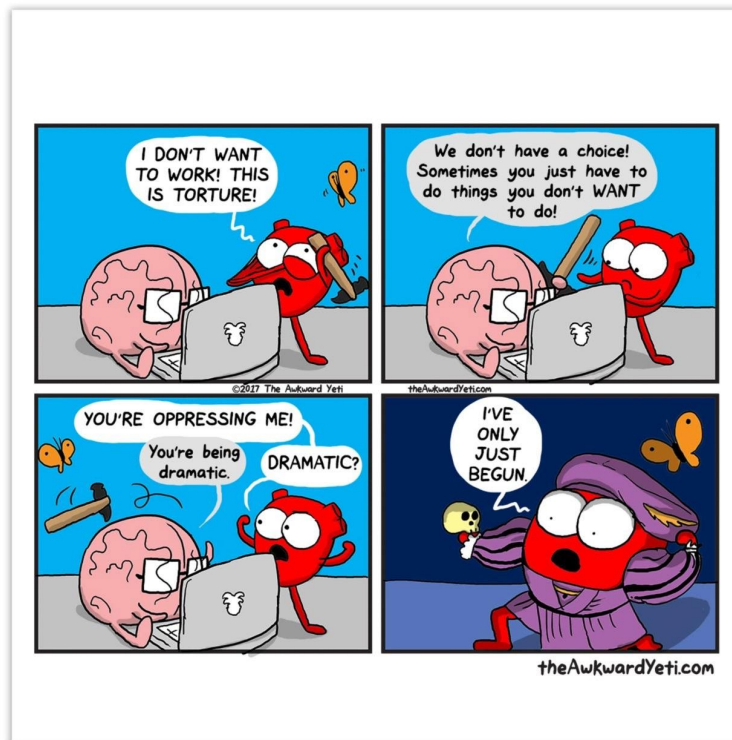
Onboarding Process - What to Expect

Step 1: Once the "onboarding kickoff call" is complete, the IIS Interoperability Specialist will provide the EHR vendor and facility contacts with the organization's login credentials to establish the interface connection to the WyIR.

Step 2: Testing is done using real-life patient and vaccination data. Providers will chart patient and vaccine information into the facility's EHR to report to the WyIR, rather than double charting.

Step 3: The IIS Interoperability Specialist will review the vaccine messages weekly until 10 non-consecutive business days of "good quality" data (no errors) are received in the WyIR. A Provider Detail Error Report (PDER) will be sent to the interfacing provider every 5 days during this testing period. The provider contacts are required to review the PDERs and fix errors, then re-submit those messages.

Onboarding Process - Continued

Step 4: When the onboarding facility has met 10 days of error-free data, the IIS Interoperability Specialist will send the facility a "One Day Chart Audit." This report shows all vaccines given during the testing period. The onboarding facility is required to review and compare the report to their facility's own records to ensure the vaccines reported match.

Step 5: If the chart audit is successful, the facility will then end the testing phase and will move into "production" or "go-live." They will then receive monthly PDERs that are required to be reviewed and are also required to fix all errors and warnings before re-submitting.

"Do's" during Onboarding Testing

- Review all PDERs
- Fix and resubmit all errors and warnings
- Contact your EHR Vendor with any questions
- Contact the IIS Interoperability Specialist with any questions

"Don'ts" during Onboarding Testing

- Ignore PDERs
- Cease communication with the EHR Vendor or IIS Interoperability Specialist

Credit: I_had_a_bad_name
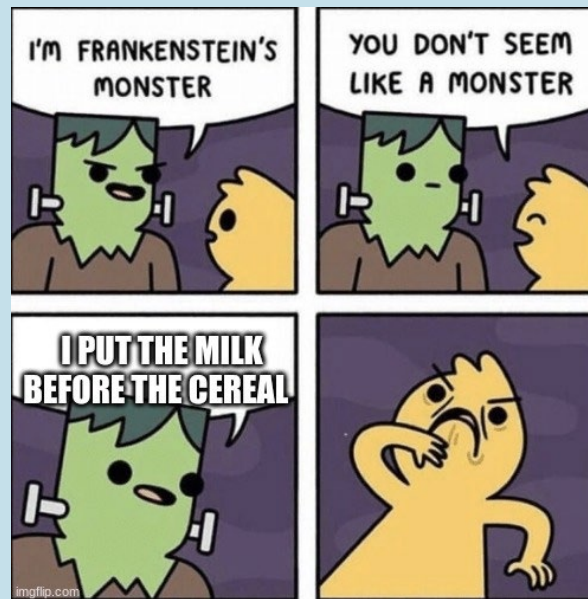
Provider Detail Error Reports (PDERs)

What are Provider Detail Error Reports (PDERs)?

● The Provider Detail Error Report **(PDER)** is a report generated from the Wyoming Immunization Registry **(WyIR)** for our provider locations that are interfaced with the WyIR.

● **T**his report provides a summary of the messages exchanged between the Electronic Health Record **(EHR)** and the WyIR, to include vaccine reporting and query, depending on the type of interface connection established.

Provider Responsibility with PDERs?

When a provider organization interfaces with the WyIR, it is requirement of the organization that errored messages be corrected and resubmitted to the WyIR to meet mandatory reporting requirements.

The monthly PDER sent to interfaced organizations helps with this process. The PDER should be reviewed each month and steps should be taken to correct and resubmit any errored messages.

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Who Receives PDERs and When?

- Every month, around the 25th, designated contacts will receive a PDER for the organization that they represent.
  - If you would like to change who receives these reports, please contact myself at Jonathan.lundquist1@wyo.gov

- The report will contain information regarding errors and warnings in interface messages that are flagged in the Wyoming Immunization Registry (WyIR).

- Along with the errors and warnings, you will be shown the facility at which they occurred, as well as the type of error or warning. This will allow you to go in and correct those errors.

Why are PDERs important?

PDERS summarize the quality of data entering the WyIR and returning to provider EHRs, as well as providing the opportunity for data quality assessment and improvement.

Furthermore, they serve as a "second-check" to ensure the number of patients that have been administered a vaccination have been accounted for and reported to the WyIR.

Warnings and Errors

-Errors: These are issues with HL7 message data that create a hard stop in the WyIR. Messages with errors do not reach a patient record, do not document in the WyIR, and do not decrement inventory from the WyIR. Errors indicate incorrect or missing data fields that the WyIR is unable to accept. Errors are required to be reviewed and fixed and the message must be resubmitted or the information needs to be manually entered into the WyIR.

- Warnings: HL7 messages with warnings indicate data fields that contain or are missing data that the WyIR does not like. Warnings do not prevent a message from reaching the WyIR or reporting to a patient record. While warnings still allow for information to flow,
these should be reviewed and corrected, when
possible, and the HL7 should be resubmitted.

Causes of Errors and Warnings

The root cause of an error or warning can differ. Errors and warnings may be caused from inaccurate programming and system development on the backend of an EHR, or they can be caused by inaccurate entry or selection in the EHR at the time of entry.

Examples:
Issue "Vaccination CVX code is missing - Message Rejected" - this is indicative of a CVX code missing or not mapped correctly to the associated vaccine in the EHR system. This could be a backend issue if these are auto-populated upon vaccination selection or this could have been a data entry mistake if this code must be manually selected.

Issue "First name is missing" - is an example of a message that was sent without a patient first name. This is likely a data entry issue.

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Correcting Errors and Warnings

Every EHR system is different. It is important to partner closely with your EHR vendor when troubleshooting and correcting errors and warnings.

Some errors and warnings may be able to be fixed directly in the EHR. Others will require programming and development from the EHR vendor.

When unsure of the issues or how to resolve them, the EHR vendor should be the first point of contact. Information from the PDER can be provided directly to the EHR vendor to help resolve issues.

If no resolution can be found by working with the EHR vendor, the next point of contact is the WyIR Help Desk.

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Examples of PDER Reports

PDER Report

PDER Dashboard

Interpreting the Report

Overview

The top section of each PDER will give you an aggregate summary of the data contained in the report.

● **Messages:** Total number of messages sent to the WyIR from the facility EHR.

 ● **Unique MRN:** Total number of new Medical Record Numbers (MRNs) sent to the WyIR from the facility EHR.

● **Errors:** Total number of errors identified from the total of messages sent.

● **Warnings:** Total number of warnings identified from the total messages sent.

Provider	Representative	User	Profile	# Messages	# unique MRN	# Errors	# Warnings
****	SIISCLIENT****	User ID #	***	152	148	0	20
****	SIISCLIENT****	User ID #	***	39	27	1	7
****	SIISCLIENT****	User ID #	***	3	2	0	0
****		User ID #	***	4	2	3	0

Error and Warning Summaries

Below the aggregate summary will be up to two sections depending on the errors and warnings.

- The first section will summarize errors and warnings related to message level data.
    - These are issues in the HL7 message structure.
- Below the message level data is the vaccination section.
    - This section will contain a summary of the errors and warnings related to vaccine issues in the HL7 message.

Provider	Representative Facility ID	User	Profile	# Message	# unique M	# Errors	# Warnings
****	SIISCLIENT****	USER ID #	***	4	4	0	0
****		USER ID #	***	742	0	0	0
Message level issues to display.							
Vaccination issues to display.							

Interpreting the Report

In each summary section are columns noting significant information that can help an organization determine what issue occurred, where in the HL7 message the issue happened, the date and time the message was submitted and the patient record of which the issue occurred. The columns significant to providers are:

- **Representative Facility ID:** The WyIR ID assigned to individual facilities. This will identify the facility that sent the message.
- **Error/Warn:** Indicates whether the information in the corresponding row was marked as an error or warning. E = Error, W = Warning.
- **Date Sent:** Indicates the date and time the message was sent to the WyIR (this may not match the date of administration depending on the reporting time).

Provider	Representative Facility ID	User	Profile	Import Log ID	Error / Warn	Date Sent
****	SIISCLIENT****	****	***	987654321	W	3/14/2023 9:13
****	SIISCLIENT****	****	***	987654321	E	3/14/2023 9:14

Interpreting the Report (Continued)

- **MRN:** The patient identifier created and assigned by the organization's EHR system. This is the identifier facilities can use to look up patients in the EHR.
- **Issue:** A short description of the issue that caused the error or warning in the message. This information is important when working with EHR vendors on a resolution.
- **Issue Location:** Indicates the location of the segment inside of the HL7 message where the error or warning occurred. This information is important when working with EHR vendors on a resolution.

MRN	Issue	Issue Location	Message Control ID
9876	patient address street2 is unwanted	PID-11.2	
5432	vaccination cvx code is missing - Message Rejected	RXA-5.1, RXA-5.4	

"Do's" after Onboarding

- Open and review PDERs
- Fix and resubmit all errors and warnings
- Contact the IIS Interoperability Specialist with concerns
- Alert the IIS Interoperability Specialist to any interface or contact changes

"Don'ts" after Onboarding

- Ignore PDERs
- Stop fixing and re-submitting errors and warning on the PDERs

Questions?

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