Wyoming Immunization Registry (WyIR) Onboarding Guide for Provider Organizations

Process and activities for provider organizations to establish and test an electronic data interface with the Wyoming Immunization Registry (WyIR)

Wyoming Department of Health - Immunization Unit
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Introduction

Purpose

This guide provides information about the process to establish and test an electronic data IIS exchange interface between an Electronic Health Record (EHR) system and the Wyoming Immunization Registry (WyIR), immunization information system (IIS). This process is referred to as "onboarding."

This guide is intended for use by provider organizations and representatives associated with these organizations or their EHR vendor representative to support establishing and testing these interfaces.

Data exchange

EHR-WyIR interfaces are supported by immunization messaging standards, including Health Level 7 International (HL7), Version 2.5.1 and SOAP Web Services. [The HL7 Version 2.5.1 Implementation Guide for Immunization Messaging, Release 1.5 and Addendum](#) provides a framework for using the HL7 standard to support immunization data exchange and the [SOAP Web Services Specifications](#) provide detail on this transport standard.

Additional details on HL7 requirements to support exchange with the WyIR are provided in the local WyIR HL7 Implementation Guide. The local [WyIR HL7 Implementation Guide](#) provides specifications for an electronic data interface between an EHR and the WyIR. These interfaces may be used to:

- Automatically transmit immunization information recorded in the EHR to the WyIR (VXU/submission messaging) and/or
- Query the WyIR for a patient's immunization record and forecast, from within the EHR (QBP/query messaging).

Provider organizations are encouraged to establish bi-directional interfaces with the WyIR, to support both submission and query messaging. The process outlined within this document assumes both submission and query messaging; see [Special Topics: Query Only Interfaces](#) if the interface will not include submission to the WyIR.

Contact

If you have questions about onboarding with the WyIR; please reach out to the WyIR by email at wyir@wyo.gov.

Overview of the Onboarding Process

Steps in the process

The onboarding process involves four main steps, including 1) Discovery and Planning, 2) Development and Testing, 3) Production Approval, and 4) Ongoing Monitoring, as outlined in Figure 1 below.

Figure 1. Overview of the steps in the WyIR onboarding process

Provider organizations are expected to complete required activities associated with each step to successfully onboard with the WyIR. Table 1 provides an overview of each step and sub-step within the process, including the goal, the required activities, and an indication of exit criteria to move forward in the process.

Project duration

An HL7 onboarding project should take approximately six (6) weeks from the onboarding kickoff with the WyIR staff through onboarding close. However, this timeline may be extended to ensure issues identified during onboarding testing and immediate post Go-Live monitoring are sufficiently addressed. Thorough review of this guide can help your provider organization prepare to meet testing and data quality expectations outlined.

Resource allocation

Provider organization representatives are expected to be responsive to the WyIR staff requests and questions to ensure an efficient process. Provider organizations are expected to ensure resource allocation and commitment across the following roles for the duration of the onboarding project. Provider organizations that are not responsive to the WyIR's outreach and requests during onboarding will be put on hold until sufficient resources are allocated to the project.

Depending on the size of the provider organization, these roles may be fulfilled by one or more individuals:

- **Onboarding project lead**: person responsible for oversight and coordination of the provider organization's onboarding efforts.
- **Onboarding technical lead**: person responsible for the technical implementation of the electronic interface.
- **Onboarding clinical/immunization lead**: person responsible for immunization data quality and clinical confirmation of query and response messaging.

In addition, your provider organization should identify the **interface production support lead**; this person is responsible for ongoing monitoring and maintenance of the electronic interface and resolution of issues post-production.

Review [Appendix A. Onboarding Responsibilities](#) for an overview of responsibilities across stakeholders, during and after the onboarding process. Refer to [Appendix B. Provider Organization WyIR Onboarding Checklist](#) for a list of onboarding activities presented in checklist format. This checklist can support project planning and resource allocation.

Table 1. Overview of the process to onboard for data exchange with the WyIR

Step	1. Discovery and Planning		2. Development and Testing		3. Production Approval and Go-Live	4. Ongoing Monitoring
	1(a) Ensure readiness	1(b) Onboarding kickoff	2(a) Establish connectivity	2(b) Testing		
Goal	Demonstrate readiness to onboard	Confirm commitment to onboard	Establish connectivity with the WyIR production environment	Submit properly formatted messages containing quality data	Initiate successful production data exchange	Ensure successful ongoing data exchange with quality data
Duration	One Time Submission	1 week	1 week	2 weeks*	1 weeks*	Ongoing
Required Activities	❑ Enroll in the WyIR ❑ Complete WyIR data exchange forms: Information Sharing Agreement (ISA), Onboarding Registration and Questionnaire ❑ Prepare for data exchange with the WyIR ❑ Prepare for the onboarding process	❑ Participate in an onboarding kickoff call ❑ Ensure & verify resource allocation to the project	❑ Implement credentials to connect with the WyIR production environment in pre-production status ❑ Troubleshoot to resolve issues as needed	❑ Submit production messages to the WyIR production environment in pre-production status for review and validation as pre-production messages ❑ Implement changes and resolve issues as needed to meet expectations ❑ Prepare legacy data to submit for data quality review	❑ Enable and monitor the production interface ❑ Clinically confirm query and response messaging, if applicable ❑ Schedule submission of legacy data ❑ Troubleshoot to resolve issues as needed to meet expectations ❑ Confirm onboarding close	❑ Conduct ongoing interface maintenance and monitoring ❑ Maintain quality data submission

Exit Criteria	❑ Receive an invitation to onboard	❑ Agree to proceed; commit to onboarding	❑ Confirm successful connectivity with production environment in pre-production status	❑ Receive approval to proceed with Go-Live	❑ Confirm successful production exchange	

*Subject to extension in one-week increments to ensure issues are sufficiently resolved to meet the WyIR expectations. Additional detail about activities within each step is further outlined below.

Step 1. Discovery and Planning

Step 1) discovery and planning, includes 1(a) ensure readiness and 1(b) onboarding kickoff.

1(a). Ensure readiness
Goal: Demonstrate readiness to onboard.

Complete readiness activities to prepare for onboarding and data exchange with the WyIR. Table 2 lists additional detail for each of the required activities. Once these activities are completed and as WyIR resources allow, you will receive an invitation to participate in an onboarding kickoff call.

The WyIR staff prioritizes the order of onboarding new connections on a first come, first serve basis when there is no current onboarding waitlist. If there is a waitlist to schedule the onboarding kickoff with the WyIR Team, provider organizations will be prioritized based on several considerations, including but not limited to:
- Completion of the readiness activities; submission of a fully executed, current Information Sharing Agreement (ISA), the WyIR Onboarding Registration Form, and the WyIR Onboarding Questionnaire Form;
- Desired data submission format and transport (bi-directional exchange in HL7 2.5.1 using the CDC WSDL of SOAP Web Services is preferred);
- Participation in the Vaccines for Children (VFC) program;
- Volume of immunizations administered;
- Number of associated facilities;
- Provider organization type;
- Patient population served; and
- Length of time in the onboarding queue.

Table 2. Activities to complete in step 1(a) ensure readiness

Complete	Activity	Description
☐	Enroll in the WyIR: Wyoming Immunization Registry (WyIR) Enrollment Form	Ensure the provider organization is currently enrolled in the WyIR by filling out the Wyoming Immunization Registry (WyIR) Enrollment form, and subsequent submission of a fully executed, current WyIR Information Sharing Agreement (ISA). Ensure all facilities associated with the provider organization are also properly enrolled in the WyIR.
☐	Ensure base technical capability to support	Ensure your EHR system is capable of supporting SOAP Web Services using the CDC

	immunization data exchange	WSDL and capable of supporting HL7 v2.5.1, release 1.5 immunization messaging.

If your EHR product is certified under the ONC Health IT Certification Program[1], editions 2015 and 2015 Cures Update, your EHR system is capable of supporting submission of data to an IIS and has the ability for an EHR user to query the WyIR for an evaluated immunization history and forecast, using HL7 v2.5.1 messaging.

If your EHR is not certified or you are unsure of its certification status, check with your EHR/technical vendor to ask about these capabilities. |
| ☐ | Complete WyIR data exchange forms: WyIR Onboarding Registration and WyIR Onboarding Questionnaire | First, complete the WyIR Onboarding Registration Form. Register your intent to exchange data with the WyIR. Provide basic information about the provider organization, your facilities, and your EHR system.

Next, complete the WyIR Onboarding Questionnaire. Provide detailed information about your EHR system, data exchange capabilities, and the provider organizations' immunization practices to inform data quality testing in the onboarding process. |
| ☐ | Prepare for data exchange with the WyIR | Review the Local WyIR HL7 Implementation Guide to understand local HL7 messaging requirements and to understand where national code and value sets are constrained or extended to support data exchange with the WyIR.

Demonstrate capability to produce HL7 v2.5.1 messaging with self-service testing validation. Create and test a suite of test messages to help |

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[1] https://www.healthit.gov/topic/certification-ehrs/certification-health-it

		ensure your EHR system is able to send the necessary data for successful data exchange with the WyIR. Submit your testing validation report to the WyIR by email to wyir@wyo.gov for review.
☐	Prepare for the onboarding process	Review this onboarding guide to understand the steps and activities involved in the onboarding process and expectations of the provider organization in participating in this process.
Exit Criteria	Receive an invitation to onboard	Completion of the WyIR Enrollment Form, WyIR Onboarding Registration Form, and WyIR Onboarding Questionnaire, as well as submission of your self-service testing validation report will place the provider organization in queue to be invited to an onboarding kickoff call, as WyIR resources allow.

1(b). Onboarding kickoff

Goal: Confirm commitment to onboard.

Step 1(b) Onboarding kickoff initiates activities with WyIR staff to onboard to data exchange. Table 3. lists additional detail for each of the required activities associated with this step.

Provider organizations are expected to be available and responsive from the onboarding kickoff through completion of the onboarding process in a timely manner. This will require regular ongoing correspondence with WyIR staff, via email, phone, and/or virtual meetings, as needed. Provider organizations that are not responsive to the WyIR outreach and requests during onboarding may be put on hold until sufficient resources are allocated to the project.

Table 3. Activities to complete in step 1(b) onboarding kickoff

Complete	Activity	Description
☐	Participate in an onboarding kickoff call	Provider organization and EHR vendor representatives responsible for technical aspects of onboarding as well as those responsible for clinical immunization practice and immunization data quality should attend the onboarding kickoff with the WyIR staff. The

		kickoff will provide an opportunity to discuss provider organization readiness, review the onboarding process, discuss onboarding expectations, discuss options around submission of legacy data, and address questions.
☐	Ensure resource allocation	Ensure appropriate and sufficient resources are allocated and committed to working with the WyIR staff through the remainder of the onboarding process, as outlined in the onboarding kickoff call, to ensure an efficient process.
Exit Criteria	Agree to proceed; commit to onboarding	If you are ready to proceed with the process as outlined in the onboarding kickoff and have resources committed to the project, the WyIR staff will work with you on next steps.

Step 2. Development and Testing

Step 2) development and testing, includes 2(a) establish connectivity and 2(b), testing.

2(a). Establish connectivity
Goal: Establish connectivity with the WyIR environment used for testing.

Once a provider organization participates in an onboarding kickoff call and commits to proceeding, the next step is to establish connectivity between the EHR system and the WyIR production environment used for testing in pre-production status. Table 4 lists additional detail for each of the required activities associated with this step.

Table 4. Activities to complete in step 2(a) establish connectivity

Complete	Activity	Description
☐	Implement credentials to connect with the WyIR production environment in pre-production status	The WyIR staff will provide credentials to establish connectivity with the WyIR production environment in pre-production status.

Complete	Activity	Description
☐	Troubleshoot to resolve issues as needed	Provider organizations are expected to troubleshoot connectivity issues until connectivity is confirmed.
Exit Criteria	Confirm successful connectivity with WyIR production environment in pre-production status	The WyIR staff will work with you to confirm successful connectivity.

2(b). Testing
Goal: Submit properly formatted messages containing quality data.

After connectivity is established, the next step involves testing in the WyIR production environment in pre-production status. Testing includes both HL7 message conformance as well as data quality review and validation. Table 5 lists additional details for each of the required activities associated with this step.

To facilitate testing, provider organizations are expected to submit production data (i.e., real patient data) to the WyIR production environment in pre-production status using the connection established in the previous step. Use of real patient data gives the best depiction of the quality of exchange between the two systems in production. Reports will be provided by the WyIR staff at the end of each week of testing detailing results of the review and validation based on messages submitted; see Appendix D. Sample WyIR Provider Detail Error Report for a sample of the WyIR Provider Detail Error Report. Provider organizations are expected to address issues identified in testing to receive an approval to proceed with Go-Live.

Table 5. Activities to complete in step 2(b) testing

Complete	Activity	Description
☐	Submit production messages to the WyIR production environment in pre-production status for review and validation	See detail below on expectations for testing, including: ● HL7 message conformance testing; ● Data quality review and validation; and ● Query testing, if applicable
☐	Implement changes and resolve issues as needed to meet expectations	Issues identified in testing can have several different causes and may require changes to the EHR system, the interface, and workflow. Once changes have been made, messages will be retested to ensure that the issues have been

		satisfactorily resolved. Provider Detail Error Reports will be provided at the end of each week of testing. In addition, these Provider Detail Error Reports will be provided each month after Go-Live. Provider organizations are required to address these issues and meet expectations as indicated below before receiving an approval to proceed with Go-Live. Testing will be extended in one-week increments until issues are sufficiently addressed.
☐	Complete query testing	Submit patient records spanning ten (10) business day via VXU to the WyIR, subsequent: 1) query initiated by an EHR user to the WyIR and 2) successful WyIR response to these queries to retrieve an exact match and patient forecast.
☐	Prepare legacy data and submit for data quality review	Legacy data refers to data already held in the EHR system on patients with previously administered and historical vaccinations known to your provider organization. Submission of this data to the WyIR helps ensure IIS data completeness. See the AIRA guidance document, *Importing Legacy Data to Improve IIS Saturation*[2] for further information.
☐	Patient record review, or "One Day Chart Audit"	After successful data quality review and validation findings, provider organizations will be asked to participate in patient record review, or "One Day Chart Audit" , to compare WyIR data to the originating medical record. WyIR staff will work with you if needed to complete this record review/chart audit. This will be necessary to be approved for Go-Live.

[2] https://repository.immregistries.org/resource/importing-legacy-data-to-improve-iis-saturation/

Exit Criteria	Receive approval to proceed with Go-Live	Once you have completed these activities, you will receive an approval to proceed with Go-Live.

HL7 message conformance testing: VXU and QBP messaging

Expectations for successful HL7 message conformance testing are noted below. Provider organization and EHR vendor representatives are expected to work in collaboration with the WyIR staff to resolve issues identified.

- ☐ Proper formatting of VXU and QBP messages, in alignment with the *National Implementation Guide for Immunization Messaging*[3] as well as WyIR requirements in the WyIR HL7 Implementation Guide.
- ☐ Inclusion of IIS-specific codes, as appropriate.
- ☐ At least 10 business days of messages with minimal critical errors, failures, or significant issues caused by the EHR system, as indicated in WyIR acknowledgement (ACK) messaging, i.e.,
    - ☐ No messages resulting in AR (application reject)
    - ☐ Minimal messages resulting in AE (application error) because of fatal errors i.e., acknowledgement message ERR segments with severity of 'E'
    - ☐ Minimal messages resulting in AE (application error) because of warnings, i.e., acknowledgement message ERR segments with severity of 'W'

WyIR staff will work with you to review the cause of any errors/warnings generated and discuss how to address issues that need correction. See Appendix C. Interpreting ACK Message for further information on interpreting ACK messaging.

Data quality review and validation: VXU messaging

Expectations for successful data review and validation for data submissions to the WyIR are noted below. Provider organization and EHR vendor representatives are expected to work in collaboration with WyIR staff to resolve issues identified.

Completeness

- ☐ Submission of data from each facility associated with the provider organization, appropriately identified in the HL7 messages and mapped to the provider organization and facility record within the WyIR.

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[3]

https://repository.immregistries.org/resource/hl7-version-2-5-1-implementation-guide-for-immunization-messaging-release-1-5-1/

- ☐ Submission reflects appropriate proportions of historical and administered vaccinations, given the provider organization's immunization practice.
- ☐ Submission of key data elements associated with patient demographics, including:
    - ☐ Medical Record Number/Patient ID
    - ☐ Patient First, Middle, and Last Name
    - ☐ Mother's Maiden Name (if the patient is a minor)
    - ☐ Patient Date of Birth/Death
    - ☐ Patient Multiple Birth and Birth Order Indicators (multiples only)
    - ☐ Patient Race
    - ☐ Patient Gender
    - ☐ Patient Address (Street, City, State, and Zip)
    - ☐ Patient Phone
    - ☐ Mother/Father/Guardian, aka next of kin (if the patient is a minor)
    - ☐ Vaccination Encounter Date
    - ☐ Vaccine Administered Product Type (CVX/NDC)
    - ☐ Administered/Historical Indicator (unless refused/not administered)
- ☐ Submission of key data elements, for administered vaccines:
    - ☐ Lot Number
    - ☐ Vaccine Lot Expiration Date
    - ☐ Dosage (administered amount)
    - ☐ Manufacturer
    - ☐ Dose-level Vaccine Eligibility, aka Vaccine Funding Program Eligibility
    - ☐ Vaccine Funding Source
    - ☐ Route
    - ☐ Body Site

Accuracy
- ☐ The volume of vaccines submitted appropriately reflects the provider organization's immunization practice.
- ☐ Vaccines administered by the provider organization are represented in the data received by the WyIR.
- ☐ Administered vaccinations have active and specific CVX/NDC codes.
- ☐ Administered vaccinations should not be coded with an "unspecified" CVX code.
- ☐ Historic vaccinations have historically correct CVX codes.
- ☐ Vaccination encounter date must not be before a patient date of birth.
- ☐ Vaccination encounter date must be less than or equal to (before or the same as) the submission date.

- ☐ Every administered vaccine should be recorded as a single vaccination event (i.e., a combination vaccine should be recorded as one event rather than separate events for each component).
- ☐ Vaccination encounter date should not be the same as the patient date of birth, unless it is recommended for administration on the date of birth (e.g., Hepatitis B).
- ☐ Manufacturer and CVX/NDC code should not contradict one another.
- ☐ Route and site should not contradict each other for a given vaccine type and patient age.

Message testing: QBP messaging

Expectations for successful QBP message testing are noted below.

- ☐ Submissions spanning ten (10) business days of records via VXU to the WyIR production environment in pre-production status, with subsequent 1) query initiated by an EHR user to the WyIR production environment in pre-production status and 2) successful WyIR response to these queries to retrieve an exact match and patient forecast.

Message testing: VXU and QBP messaging: Patient record review, "One Day Chart Audit"

After successful data quality review and validation findings, provider organizations will be asked to participate in patient record review, or "One Day Chart Audit" , to compare WyIR data to the originating medical record. WyIR staff will work with you if needed to complete this record review/chart audit. This will be necessary to be approved for Production status.

Step 3. Production Approval and Go-Live
Goal: Initiate successful production data exchange.

Step 3) Production approval and Go-Live is a switch from pre-production status to production status between the EHR system and the WyIR production environment, enabling the production interface. Details related to each of these activities are listed in Table 6 below.

Close monitoring of a new production interface helps ensure quality data exchange. If there are significant issues identified at this step, a provider organization may be required to go back to step 2(b) message and data review to address.

Table 6. Activities to complete in step 3) production approval and Go-Live

Complete	Activity	Description
☐	Enable and monitor the production interface	Initiate the production interface between the EHR and the WyIR. See further detail below on monitoring a new production interface. As a reminder, there is no need to replace the interface credentials as the credentials used to

		establish connectivity in Step 2(a) were for the WyIR production environment. After approval is provided, the WyIR team will switch the interface over from the "pre-production" setting over to "live production".
☐	Clinically confirm query and response messaging, if applicable	For interfaces that include query and response messaging, a physician or clinical user must confirm successful messaging in the production environment. See further detail below on expectations for this clinical confirmation.
☐	Submit legacy data	Work with the WyIR staff to submit legacy data to help ensure WyIR data completeness.
☐	Troubleshoot to resolve issues as needed to meet expectations	Provider organizations are required to address identified issues and meet expectations as indicated below before close-out of an onboarding project. Post-Go-Live monitoring will be extended in one-week increments until issues are sufficiently addressed.
☐	Confirm onboarding close	Work with the WyIR staff to confirm all activities associated with onboarding are complete. Review post-onboarding responsibilities (see [Appendix A. Onboarding Responsibilities](#)). Ensure appropriate resources are allocated to ongoing interface monitoring and maintaining quality data submission for the lifetime of the interface.
Exit Criteria	Confirm successful production exchange	Once the production interface meets expectations as outlined you can proceed to the next step, ongoing monitoring.

Monitoring a newly established production interface

Expectations for successful production interface monitoring are noted below. Provider organizations and EHR vendor representatives are expected to monitor and resolve any issues identified, in collaboration with the WyIR staff.

☐ At least 10 business days of messages with minimal critical errors, failures, or significant issues caused by the EHR system, as indicated in IIS acknowledgement (ACK) messaging, i.e.,
  ☐ No messages resulting in AR (application reject)
☐ Minimal messages resulting in AE (application error) because of fatal errors, i.e., acknowledgement message ERR segments with severity of 'E'
☐ Minimal messages resulting in AE (application error) because of warnings, i.e., acknowledgement message ERR segments with severity of 'W'

WyIR staff will work with you to review the cause of any errors/warnings generated and discuss how to address issues that need correction. See Appendix C. Interpreting ACK Messages for further information on interpreting ACK messaging.
☐ Submission of data from each facility associated with the provider organization, appropriately identified in the HL7 messages and mapped to the provider organization within the WyIR.
☐ Continued submission of quality data to the WyIR production environment (see data quality review and validation expectations in step 2(b).

Clinical confirmation of QBP messaging

Expectations for clinical confirmation (confirmation by a physician or clinical user) are noted below. Provider organization and EHR vendor representatives are expected to work in collaboration with WyIR staff to resolve issues identified.

☐ Clinical confirmation that queries retrieve appropriate matches from the WyIR.
☐ Clinical confirmation that query responses are appropriately displayed and consumed by the EHR system.

Step 4. Ongoing Monitoring
Goal of step 4: Ensure successful ongoing data exchange with quality data.

The final step of the onboarding process is to transition to ongoing monitoring and maintenance for the lifetime of the interface. Detailed activities associated with this step are outlined in Table 7 below.

Table 7. Activities to complete in step 4) ongoing monitoring

Complete	Activity	Description
Ongoing	Conduct ongoing interface maintenance and monitoring	Provider organizations are expected to monitor WyIR acknowledgement messages and follow-up on and address errors for the lifetime of the interface.

		Provider organizations are also expected to maintain interfaces, by ensuring inclusion of new vaccine codes, for example.
Ongoing	Maintain quality data submission	Follow-up on data quality questions and/or concerns as needed. Your provider organization's identified point of contact will receive monthly Provider Detail Error Reports via secure email that summarizes production messages submitted by provider organization facilities over the previous month, into successful, warning and error data. Warnings and Errors must be corrected and resubmitted to the WyIR. If you have questions or need support correcting the warnings and errors in the report, please reach out to your EHR vendor representative and the WyIR team. For more information, see [Appendix D. Sample WyIR Provider Error Detail Report](#).

Special Topics

Query only interfaces

A query-only interface may be needed to support facilities that don't administer vaccinations but need access to patient histories and vaccine forecasts. This connection is supported through query and response (QBP/RSP) messaging. While a query-only interface will still require stakeholders to work together to establish connectivity, the onboarding process may be abbreviated. If you believe a query-only connection is appropriate for your organization, please reach out to the WyIR to obtain approval and discuss next steps.

Changes to existing interfaces: Re-testing and re-validation

Contact the WyIR at wyir@wyo.gov, to report any changes to an existing interface, including:

- Addition of new provider organizational facilities (who use the same EHR system);
- Addition of query messaging to an existing submission interface;
- Transition in message format; and/or
- Transition in transport method.

WyIR staff will work with your provider organization to complete re-testing and re-validation in these scenarios.

Re-onboarding

Re-onboarding, or completion of the full onboarding process, is required in certain circumstances, including:
- Transition to a new EHR system; or
- To address a poor-quality interface (as evidenced by connectivity issues, messaging errors, and/or significant data quality concerns).

WyIR staff will work with your provider organization to complete re-onboarding in these scenarios.

Appendices

Appendix A. Onboarding Responsibilities

A successful onboarding process relies on the engagement of representatives from the WyIR, the provider organization, and the EHR technical team. The following table provides general information about the responsibilities of each of the primary stakeholders during and after the onboarding process.

Table 8. Stakeholder responsibilities during and after the WyIR onboarding process

Stakeholder	Responsibilities during onboarding	Responsibilities post-onboarding (ongoing monitoring)
WyIR and Immunization Unit staff	- Provide general coordination/project management, communication, and customer service. - Provide specific contacts with technical and programmatic expertise. - Provide an appropriate testing and validation platform. - Communicate details about the onboarding process and thresholds for success. - Make onboarding documentation easily accessible and readily available, and ensure that it is always up-to-date. - Provide timely feedback on message conformance and data quality. - Assist with issue identification and troubleshooting. - Manage expectations about process, milestones, and timelines.	- Provide training on effective use of the WyIR. - Communicate ongoing expectations around maintaining the production interface. - Monitor data feeds for errors. - Notify provider organizations of any changes or outages that may impact existing interfaces. Note: this should be done as early as possible so other partners can properly prepare and execute any changes required on their end. - Continue to post updated documentation as requirements and standards evolve.

	• Inform stakeholders of any system updates and changes. • Provide input on VFC requirements.	
Provider organization staff	• Complete all necessary enrollment forms and paperwork and engage the EHR vendor to get onboarding resources assigned. • Identify a primary representative to be an active participant in all elements of the onboarding process and attend meetings and conference calls as appropriate. • Provide production data for testing and validation. • Coordinate appropriate staff for end user testing and troubleshooting. • Identify and resolve issues caused by improper workflows or poor data entry that adversely impact data quality. • Work with EHR vendor or provider organization technical staff to resolve issues with the interface or submitted messages.	• Verify initial setup is correct and data from the EHR system is successfully populating the production environment in the WyIR. • Monitor ACK interface and appropriate EHR and WyIR reports to identify changes in volume or quality of messages or anything else that raises red flags about the interface. • Immediately report issues to the WyIR and EHR vendor for assistance in troubleshooting. • Correct data entry errors and establish appropriate policies and procedures to address issues with workflow and data quality; train staff as needed. • Communicate with the WyIR about any system changes/updates or outages that may impact existing interfaces. • Provide updated contact information for staff changes at either the provider organization or EHR vendor. • Notify the WyIR of any mergers, acquisitions, or closures.

		- Keep vaccinating!
EHR/IT vendor technical staff and EHR vendor representatives	- Provide project management and technical expertise (testing and development) on behalf of the EHR team. - Be an active participant in all elements of the onboarding process and attend all meetings and conference calls. - Ensure the EHR system aligns with HL7 transport and messaging standards. - Work with the WyIR to identify, troubleshoot, and quickly resolve any issues with the interface or submitted messages. - Help the WyIR manage expectations about processes, milestones, and timelines with the provider organization. - Assist provider organizations with proper configuration of their EHR system.	- Assist provider organization with proper configuration of their EHR system. - Train provider organization staff on how to monitor their interface (performance and ACKs) and resolve issues or seek assistance, as needed. - Facilitate transition from the onboarding and implementation team to the long-term support team. - Assist with maintaining the connection and monitoring the interface for performance and errors. - Provide technical support to the provider organization and resolve any technical issues. - Maintain conformance with HL7 transport and messaging standards. - Notify provider organization (and possibly the WyIR) of any changes or outages that may impact existing interfaces.

Appendix B. Provider Organization WyIR Onboarding Checklist

Table 9. Provider organization WyIR onboarding checklist

Step/ Activity	Resources	Status
Step 1. Discovery and Planning		
Step 1(a) Ensure Readiness	WyIR Onboarding Guide WyIR Onboarding Readiness Checklist CDC IIS Health Level 7 (HL7) Implementation Guide with Addendum	
Enroll in the WyIR	Wyoming Immunization Registry (WyIR) Enrollment Form WyIR User Access Enrollment Form	
Ensure base technical capability to support immunization data exchange	WyIR Onboarding Readiness Checklist	
Complete and sign the the WyIR Information Sharing Agreement (ISA)	Created and sent .pdf by the WyIR Team	
Complete the WyIR Onboarding Registration Form	WyIR Onboarding Registration Form	
Complete the WyIR Onboarding Questionnaire	WyIR Onboarding Questionnaire	
Prepare for data exchange with the WyIR: Review local HL7 requirements	WyIR HL7 Implementation Guide	
Demonstrate capability to produce HL7 v2.5.1 messages	NIST Immunization Test Suite NIST Immunization HL7 Validation Testing Tutorial NIST Demonstration Video	

Prepare for the onboarding process	[WyIR Onboarding Readiness Checklist](#)	
Step 1(b) Onboarding Kickoff		
Participate in an onboarding kickoff call	Scheduled with Immunization Unit	
Ensure resource allocation	Provider responsibility	
Step 2. Development and Testing		
Step 2(a) Establish Connectivity		
Implement credentials to connect with the WyIR production environment in pre-production status	Provided by WyIR team	
Troubleshoot to resolve issues as needed	Provider & EHR responsibility	
Step 2(b) Testing		
Submit production messages to the WyIR environment for review and validation	Provider & EHR responsibility	
Implement changes and resolve issues as needed to meet expectations	Provider & EHR responsibility	
Prepare legacy data and submit for data quality review	Provider & EHR responsibility Contact the WyIR team to schedule submission date and time	
Step 3. Production Approval and Go-Live		
Enable and monitor the production interface	WyIR & EHR responsibility	
Clinically confirm query and response messaging	Provider & EHR responsibility	
One Day Chart Audit	WyIR team will send to provider to complete	
Submit legacy data	Provider & EHR responsibility	

Troubleshoot to resolve issues as needed to meet expectations	Provider & EHR responsibility	
Confirm onboarding close	WyIR Team	
Step 4. Ongoing Monitoring		
Conduct ongoing interface maintenance and monitoring	Both	
Maintain quality data submission	Provider & EHR responsibility	

Appendix C. Interpreting ACK Messages[4]

MSA-1 Value	Description	National IG Description	Scenario: ERR segment(s) and ERR-4 severity	Understanding of IIS Response	Sender Follow-Up Expectation
AA	**Application acknowledgement: accept**	Message accepted and processed.	No ERR segments.	Message accepted.	No action needed.
			ERR segment(s) with severity of 'I' for **information**. (No severity 'W' or 'E' errors).	Message accepted with returned information.	
AE	**Application acknowledgement: error**	Message accepted and processed, and errors are being reported.	At least one ERR segment with severity of 'W' for **warning**. (No severity 'E' errors).	Message accepted but there may be issues. These may include non-fatal errors with potential for loss of data.	Take action to correct issue(s) in the sending system*.
			At least one ERR segment with severity of 'E' for **error** (aka **fatal error**).	Message and/or data rejected. The IIS rejected data that it views as important.	Take action to correct issue(s) in the sending system and resubmit. *
AR	**Application acknowledgement: reject**	Message rejected due to: unsupported message type, event code, and processing ID ● unable to process for reasons unrelated to format or content	At least one ERR segment with severity of 'E' for **error** (aka **fatal error**), with 1 of 4 conditions specified.	Message rejected. The message was not processed.	Take action to correct issue(s) in the sending system and resubmit. *

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[4] Adapted from Guidance for HL7 Acknowledgement Messages to Support Interoperability

*If the cause of the issue is determined to be the sending system. In some cases, the issue may be due to the WyIR; work with WyIR staff to identify the cause of the issue and appropriate next steps.

Appendix D. Sample WyIR Provider Error Detail Report

The Provider Detail Error Report will be sent via secure email at the end of each week of testing during onboarding. After approval to Go-Live in production, the report will be shared monthly on the 25th with the expectation that errors are addressed and corrected promptly. If you have any questions about these reports, please contact the WyIR by email at wyir@wyo.gov.

Table 11 is an example of a full monthly Provider Error Detail Report with three (3) main sections of data, and how to interpret and address the results.

Table 11. Example WyIR Provider Error Detail Report

Full Monthly Provider Detail Error Report

Start Date: January 26, 2022
End Date: February 25, 2022
Providers: Example Provider Medical Center
Display: Warnings and Errors

Provider	Representative Facility ID	User	Profile	# Messages	# unique MRN	# Errors	# Warnings
####	SIISCLIENT###	EXMCHL7	123	159	146	0	21
####	SIISCLIENT###	EXMCHL7	123	64	62	0	15
####	SIISCLIENT###	EXMCHL7	123	2	1	0	2
####	SIISCLIENT###	EXMCHL7	123	7173	0	1	0
####	SIISCLIENT###	EXMCHL7	123	103	80	4	2
####	SIISCLIENT###	EXMCHL7	123	197	45	0	5

Provider	Representative Facility ID	User	Profile	Import Log ID	Error / Warn	Date Sent	MRN DELETE INFO BELOW	Issue	Issue Location	Message Control ID
####	SIISCLIENT###	EXMCHL7	123	1234569	W	1/26/2022 12:57	10101010	Patient phone of usecode CP is invalid	PID-13	123456
####	SIISCLIENT###	EXMCHL7	123	1234569	W	1/28/2022 0:20	10101010	patient address street2 is unwanted	PID-11.2	393170
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/15/2022 7:30	10101010	vaccination cvx code is missing - Message Rejected	RXA-5.1, RXA-5.4	2.15073E+16
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/23/2022 7:30	10101010	vaccination date is missing - Message Rejected	RXA-3	2.23073E+16
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/16/2022 7:30	10101010	vaccination date is missing - Message Rejected	RXA-3	2.16073E+16
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/16/2022 7:30	10101010	vaccination date is missing - Message Rejected	RXA-3	2.16073E+16
####	SIISCLIENT###	EXMCHL7	123	1234569	W	2/10/2022 7:30	10101010	patient address state is missing	PID-11.4	2.10073E+16

Provider	Facility ID	User	Profile	Import Log ID	Error / Warn	Date Sent	MRN	Issue	Issue Location	Historical	Message Control ID	Vaccination Date	Vaccination
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/15/2022 7:30	10101010	vaccination cvx code missing	RXA-5.1, RXA-5.4		2.15073E+16	2/11/2022	
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/23/2022 7:30	10101010	vaccination date missing	RXA-3		2.23073E+16		Engerix-B
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/16/2022 7:30	10101010	vaccination date missing	RXA-3		2.16073E+16		Varivax
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/16/2022 7:30	10101010	vaccination date missing	RXA-3		2.16073E+16		Engerix-B
####	SIISCLIENT###	EXMCHL7	123	1234569	W	2/15/2022 7:30	10101010	vaccination lot missing	RXA-15		2.15073E+16	2/11/2022	
####	SIISCLIENT###	EXMCHL7	123	1234569	W	2/15/2022 7:30	10101010	vaccination lot expiration date missing	RXA-16		2.15073E+16	2/11/2022	
####	SIISCLIENT###	EXMCHL7	123	1234569	W	2/2/2022 7:30	10101010	vaccination lot expiration date missing	RXA-16		2.02073E+16	2/1/2022	Varivax

APPENDIX D(A). SAMPLE WYIR PROVIDER ERROR DETAIL REPORT: *Reading the Provider Error Detail Report*

Our monthly Provider Error Detail Reports are broken into 3 main sections of data:

- Monthly Summary Details
- Errors/Warnings related to patient and facility-level demographic data
- Errors/Warnings related to vaccine-level demographic data

Section 1. Monthly Summary

The monthly summary for the provider organization and facility is located at the very top of the report, organized by facility ID/SIISCLIENT ID. Your facility ID/SIISCLIENT ID is specific to the facility. The next columns of data break down the total amount of messages, errors, and warnings by facility at the top left of the report.

This section of the report details all of the messages each facility sent over the previous month. Then, it identifies which messages produced an error or a warning.

Table 12 is an example of the Monthly Summary section of the Provider Error Detail Report and how to interpret and address the results.

Table 12. Example WyIR Provider Error Detail Report Summary

Section 1. Monthly Summary							
Provider	Representative Facility ID	User	Profile	# Messages	# unique MRN	# Errors	# Warnings
####	SIISCLIENT###	EXMCHL7	123	159	146	0	21
####	SIISCLIENT###	EXMCHL7	123	64	62	0	15
####	SIISCLIENT###	EXMCHL7	123	2	1	0	2
####	SIISCLIENT###	EXMCHL7	123	7173	0	1	0
####	SIISCLIENT###	EXMCHL7	123	103	80	4	2
####	SIISCLIENT###	EXMCHL7	123	197	45	0	5

Section 2. Errors and Warnings related to Patient and Facility Demographic Data

Section 2. outlines all errors and warnings related to patient and facility-level demographics. For example, the "*Patient Street Address is Missing*".

This section provides key information including: the provider organization facility that sent the message, whether an error or a warning was identified, the date and time the message was sent, the patient identifier (MRN), the issue within the message, and the location of the issue within the message. The expectation is that provider staff review and respond to errors and warnings with the appropriate correction. Please contact the WyIR at wyir@wyo.gov if you are unsure of your facility's SIISCLIENT ID.

Table 13 is an example of the patient and facility-level section of the Provider Error Detail Report and how to interpret and address the results.

Table 13. Example WyIR Provider Error Detail Report Patient and Facility-Level Data

Section 2. Patient and Facility-Level Data									
Provider	Representative Facility ID	User	Profile	Import Log ID	Error / Warn	Date Sent	MRN	Issue	Issue Location
####	SIISCLIENT###	EXMCHL7	123	1234569	W	1/26/2022 12:57	10101010	Patient phone of usecode CP is invalid	PID-13
####	SIISCLIENT###	EXMCHL7	123	1234569	W	1/28/2022 0:20	10101010	patient address street2 is unwanted	PID-11.2
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/15/2022 7:30	10101010	vaccination cvx code is missing - Message Rejected	RXA-5.1, RXA-5.4
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/23/2022 7:30	10101010	vaccination date is missing - Message Rejected	RXA-3
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/16/2022 7:30	10101010	vaccination date is missing - Message Rejected	RXA-3
####	SIISCLIENT###	EXMCHL7	123	1234569	E	2/16/2022 7:30	10101010	vaccination date is missing - Message Rejected	RXA-3
####	SIISCLIENT###	EXMCHL7	123	1234569	W	2/10/2022 7:30	10101010	patient address state is missing	PID-11.4

Section 3. Errors/Warnings related to Vaccine Data

The last section of the report outlines all errors and warnings related to vaccine-level data. For example,"*vaccine expiration date is after the vaccination date*".

Section 3. provides key information including: the provider organization facility that sent the message, whether an error or a warning was identified, the date and time the message was sent, the patient identifier (MRN), the issue within the message, and the location of the issue within the message. The expectation is that provider staff review and respond to errors and warnings with the appropriate correction.

Table 14. Example WyIR Provider Error Detail Report Vaccine-Level Data

Section 3. Vaccine-Level Data				
Issue	**Issue Location**	**Message Control ID**	**Vaccination Date**	**Vaccination**
vaccination cvx code missing	RXA-5.1, RXA-5.4	2.15E+16	2/11/2022	
vaccination date missing	RXA-3	2.23E+16		Engerix-B
vaccination date missing	RXA-3	2.16E+16		Varivax
vaccination date missing	RXA-3	2.16E+16		Engerix-B
vaccination lot missing	RXA-15	2.15E+16	2/11/2022	
vaccination lot expiration date missing	RXA-16	2.15E+16	2/11/2022	
vaccination lot expiration date missing	RXA-16	2.02E+16	2/1/2022	Varivax

APPENDIX D(B). SAMPLE WYIR PROVIDER ERROR DETAIL REPORT: *Correcting Warnings and Errors from the data in the Provider Error Detail Report*

Provider Error Detail Report Analysis
The WyIR team is happy to help our providers correct errors and warnings on the monthly Provider Error Detail Report. The WyIR team is dedicated to improving the quality of data in the WyIR and helping our providers maintain a high level of data integrity that is thorough and accurate for their patients.

Errors
Messages sent to the WyIR that received "E", or errors, and did not process correctly are considered "Hard Stops" and are crucial errors. This means, the message is rejected entirely and the patient and vaccination information will not be found in the WyIR until a correction is made and the message is resent to the WyIR .

For example, an error like "*vaccine expiration date is after the vaccination date*" is best to approach by identifying the root cause. Was the patient given an expired dose? If so, no correction is necessary as the record reflects the true clinical encounter. Alternatively, you may find the incorrect expiration date was entered into inventory or the vaccination date was entered incorrectly.

Another possibility is that it may be an issue within the EHR system reading the dates incorrectly. This would be a correction that would involve collaboration with your EHR vendor representative to troubleshoot further and resolve.

There also may be some limitations of your EHR system that will not allow for correction at the provider-level and the provider organization's EHR Vendor representative may be able to correct on your behalf.   If the EHR system isn't capable of correcting, the provider organization may need to login to the WyIR to make this correction manually using the patient's name, date of birth, and patient identifier (SIISCLIENT ID).

Warnings

Messages sent to the WyIR that received "W", or warnings, were accepted into the WyIR, however portions of the message did not process correctly and will indicate an issue with required or necessary data elements.

Steps to resolve Errors and Warnings
- Review the Provider Detail Error Report sent to your team.
- Research and identify the root cause of the errors or warnings.
- Identify and execute the appropriate correction.
- Correct the patient's data at the EHR system or manually in the WyIR if applicable.
- Resend the message with the corrected data to the WyIR.
- Contact the WyIR at wyir@wyo.gov if you have made the corrections but still see the issue occurring.

APPENDIX D(C). SAMPLE WYIR PROVIDER ERROR DETAIL REPORT: *Resources and Support*

Resources
- WyIR HL7 Implementation Guide

WyIR Provider Error Detail Report Support

The WyIR team will send Provider Error Detail Reports starting the 25th of each month and Please report any issues or contact changes by contacting the WyIR by email at, wyir@wyo.gov.