



TEXAS
Health and Human
Services

Texas Department of State
Health Services

Texas Immunization Registry: Informational Guide on Bidirectional Data Exchange

Contents

Purpose	2
BiDX Explained	2
Searching for Patients	2
Reporting Immunizations for Patients.....	3
BiDX Benefits.....	4
Determine Readiness for BiDX	4
Registry Consent via BiDX.....	4
Prior to the Beginning of BiDX Testing.....	5
Consult Your EHR.....	5
Test Patient Information	6
Configuring Your Organization for Query Messages.....	6
BiDX Onboarding Process.....	7
Login Credentials	7
Connectivity Information for Web Services.....	7
BiDX Testing.....	9
Patient Query (QBP) Testing.....	10
Patient Immunization History (VXU) Testing.....	10
Production	10
Contact Information.....	10

Purpose

To provide health care organization's high-level information about bidirectional data exchange (BiDX) of patient and immunization data with the Texas Immunization Registry:

- BiDX Explained
- BiDX Benefits
- Determine Readiness for BiDX
- Onboarding for BiDX

BiDX Explained

Bidirectional exchange of patient and immunization data is the two-way, real-time communication between a facility's Electronic Health Record (EHR) system or vendor and the registry's Immunization Information System (IIS).

BiDX allows a health care organization to search (also known as querying) for a patient's immunization record and retrieve the immunization record if the patient is a registry client. It also allows for the querying of a patient's immunization record to identify what immunizations the patient may be due for. This is known as querying and forecasting. Health care organizations may also update a registry client's personal and immunization record (also known as reporting).

Searching for Patients

Here is a high-level overview of how providers would query (search) for a patient in the IIS.

1. A provider uses their EHR to request a patient's immunization record from the IIS. The EHR system can request either one of the below to be returned:
 - a. Immunization record, or
 - b. Immunization record with the recommendation of immunizations the patient is due for (i.e., immunization clinical decision support, aka vaccine forecast).
2. The EHR system sends a query (QBP) to the IIS containing the patient's demographics and other key information.
3. The IIS receives the query and searches for the patient. If the patient is not found, the IIS creates a response of 'not found'. If the patient is found, the IIS creates a response that includes the immunization record or the immunization record and recommendations.
4. The IIS sends the response to the EHR system using a response by parameter (RSP) message.

5. The response is displayed to the provider. The specific response displayed is determined by the provider's EHR vendor.

Reporting Immunizations for Patients

A similar process takes place when a provider reports an immunization administration (VXU).

1. A provider uses their EHR to send a patient's immunization administration from their EHR to the IIS.
2. The EHR system sends a VXU message to the IIS containing the patient's demographics, information on the immunization administered and the organization who administered the immunization.
3. The IIS receives the message and validates the data to ensure it does not contain any data quality errors or issues. If errors or issues exist, the data does not move into the next phase of validation, but an error message is generated and sent back to the EHR to inform the provider of the issue, so it can be resolved.
4. If the message is error free, then the IIS searches for the patient to see if they are an existing IIS client.
 - a. If the patient is not found, the IIS creates an error response to the EHR that the client is not found (CLR-100). Therefore, the data reported could not be stored in the IIS.
 - b. If the patient is found, the IIS stores the immunization in the clients records and creates a RSP message to the EHR that the data was accepted.
1. The response is displayed to the provider. The specific response displayed is determined by the provider's EHR vendor.

BiDX Benefits

1. Help reduce provider burden by allowing providers to electronically submit immunization data versus manual data entry. The connection of a provider's EHR to the IIS allows for a streamlined way for reporting and identifying data quality issues.
2. Reduces the dual entry of patient data into provider's EHR and the IIS. Providers no longer need to log in to ImmTrac2 to view or search patient immunizations and can use their EHR to search for patient data in the IIS and report immunization data to the IIS directly.
3. Improves patient safety by avoiding over or under immunizing. Providers can see real-time records for patients to determine which immunizations patients may need or are soon due.
4. Increases provider access to patient and population data:
 - a. Offers real time patient data.
 - b. Provides easy access to patient's consolidated history of immunizations received from multiple sources.

Determine Readiness for BiDX

To determine your readiness for BiDX review the **Bidirectional Readiness Checklist** (Stock #11-14235), available on our [DSHS website](#).

Consult with your IT staff and EHR to determine if your systems are ready for BiDX. Upon completion of the checklist, providers must notify the registry's Interoperability Team of readiness.

Your organization is considered ready for BiDX when the Interoperability Team validates and confirms your readiness.

Registry Consent via BiDX

One of the registry's strongest recommendations for organization's pursuing BiDX is that they capture and send registry consent via BiDX. Registry consent via BiDX is accepted through two methods:

- HL7 Affirmation, which:
 - Uses HL7 messaging, specifically in the PD1 and MSH Segments, that contain the required registry consent information.
 - Requires one web services interface for affirmation of registry consent, querying (QBP) for patients and reporting immunizations (VXU).
 - Requires EHR vendor's ability to support the registry's consent laws and unique consent values for PD1-12.



- Has resources available on our [DSHS website](#) to support this method:
 - **Texas Immunization Registry HL7 2.5.1 Implementation Guide (Stock #11-14972)**
 - **Affirmation of Registry Consent via Health Level Seven (Stock #11-15773)**
 - **Texas Immunization Registry – Consent Overview (Stock #11-15702)**
- Flat File Affirmation, which:
 - Provides a unique message in plain text format that contains registry consent information.
 - Utilizes the existing Electronic Standards for Affirmation of Registry Consent but the transport method is via web services vs FTP.
 - Requires two web services interfaces: one for the affirmation of registry consent and one for the querying (QBP) for patients and reporting immunizations (VXU).
 - Offers an option for providers whose EHR Vendor can't support HL7 Affirmation.
 - Has resources available on our [DSHS website](#) to support this method:
 - **Electronic Standards for Affirmation of Registry Consent (Stock #E11-13415)** for the specifications for the file contents.
 - **Texas Immunization Registry – Consent Overview (Stock #11-15702)**

Prior to the Beginning of BiDX Testing

Consult Your EHR

Your organization must consult with your EHR vendor prior to beginning testing to address the following items:

- Test data and patient information, and
- Configure your organization for query messages.

Existing Data Exchange Submissions

Your organization is to continue existing FTP (weekly) submissions to the registry during onboarding for BiDX.

Test Patient Information

To prevent production data being sent while testing, it is best for your EHR vendor to use data that reflect production volume and patients. This allows the registry to evaluate your data and identify any data quality issues or errors.

The registry provides your organization with test patients and scenarios (i.e., age of patient with new immunization administration) which must be entered into your EHR system for testing. You may use your own patients for testing during onboarding for BiDX.

Remember that none of the records submitted during testing will be added to the production (live) environment.

Configuring Your Organization for Query Messages

Your organization's configuration for query (QBP) messages controls the patient information returned by the registry¹ which is determined by how your QBP message is formatted.

There are two types of QBP message types or formats, which are distinguished in the QPD-1 segment. They include a:

- Z34 message that returns a complete immunization history for patient²; or
- Z44 message that returns an evaluated history³ (i.e. a patient history along with vaccines recommended based on the history).

Consult with your EHR Vendor on the appropriate QBP message type for your organization. The below table (see *Table 1: QBP Message Types*) provides a summary of the QBP types to assist in the appropriate selection. Note that vaccine recommendations returned may be inaccurate if the registry client immunization record is incomplete.

Profile	QBP Type Z34	QBP Type Z44
Organization is interested in only a patient's immunization history, and not the patient's vaccine recommendations. ⁴	√	
Organization is interested in both the patient's immunization history and recommendations. ⁵		√*

Table 1: QBP Message Types

¹ The registry only returns patient demographics and immunization history for persons who have previously signed the appropriate consent form to have their immunization data stored electronically with the registry.

² *ibid.*

³ *ibid.*

⁴ *ibid.*

⁵ *ibid.*

BiDX Onboarding Process

When an organization submits the bidirectional data exchange registration of intent and is approved by the state registry for onboarding for bidirectional data exchange, the organization is confirming that they have already completed all necessary hl7 interface development and are ready to complete the required testing.

The required testing and onboarding consists of connecting to the registry's web services, submitting hl7 messages (qbp/vxu), identifying ImmTrac2 generated errors, making corrections to hl7 messages and resubmit hl7 messages to pass the testing.

Once a provider is approved for onboarding by the Interoperability Team, the registry provides and supports the provider with:

- Weekly meetings with the provider and EHR vendor,
- Frequent communication via email and/or phone call,
- Registration of intent for BiDX,
- Login (web service) credentials for testing,
- Connectivity information for web services,
- Test plan and scenarios for BiDX, and
- Login (web service) credentials for production.

Please note that state registry staff support data exchange and HL7 needs that relate to ImmTrac2 generated errors after HL7 files have been submitted. State immunization registry staff do not support HL7 interface development prior to or after HL7 files being submitted.

Login Credentials

When web services login credentials are issued, the registered ImmTrac2 point of contact (POC) for your organization receives an encrypted secure email containing the credentials. These credentials are used to connect to the appropriate registry environment and for performing required testing.

Each organization receives one set of credentials. Organizations reporting for multiple locations or sites, such as a parent or headquarters, receive only one set of credentials for their entire organization, which are shared with the parent organization's POC.

Connectivity Information for Web Services

Use your organization's Simple Object Access Protocol (SOAP) web service application and the web service credentials provided to your organization to connect

to the registry.

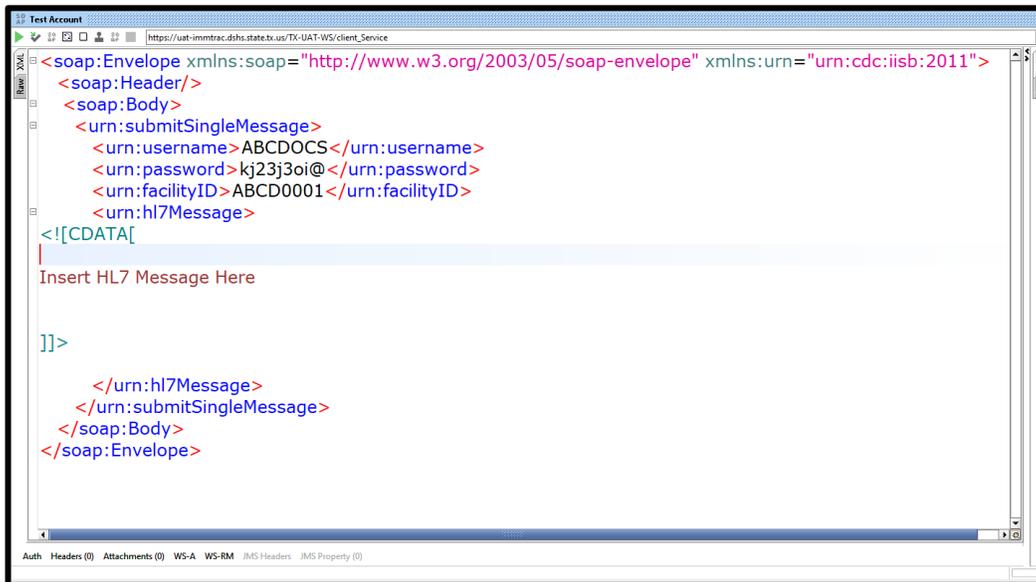
Testing

Organizations use the Texas WSDL to connect via SOAP to the registry's test environment, which is used for BiDX testing. The Texas WSDL is an exact copy of the CDC WSDL so organizations, IT support staff and EHR vendors can refer to the CDC WSDL for key information.

All the necessary information to connect, including the WSDL, is available at the URL provided. You use the test web services credentials provided to the POC, which are sent at the time the organization is approved for onboarding for BiDX.

Create a XML SOAP envelope using your credentials: Username, Password and Facility ID.

Refer to *Figure 1: Sample XML SOAP Envelope for HL7* on how your envelope must be configured for QBP/VXU/HL7 Affirmation testing.



```

<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:urn="urn:cdc:iisb:2011">
  <soap:Header/>
  <soap:Body>
    <urn:submitSingleMessage>
      <urn:username>ABCDOCS</urn:username>
      <urn:password>kj23j3oi@</urn:password>
      <urn:facilityID>ABCD0001</urn:facilityID>
      <urn:hl7Message>
        <![CDATA[
          Insert HL7 Message Here
        ]]>
      </urn:hl7Message>
    </urn:submitSingleMessage>
  </soap:Body>
</soap:Envelope>

```

Figure 1: Sample XML SOAP Envelope for HL7

Refer to *Figure 2: Sample XML SOAP Envelope for Flat File Affirmations* on how your envelope must be configured for registry consent.



```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:urn="urn:cdc:iisb:2011">
  <soap:Header/>
  <soap:Body>
    <urn:submitAffirmationMessage>
      <urn:username>ABCDOCS</urn:username>
      <urn:password>kj23j3oi@</urn:password>
      <urn:facilityID>ABCD0001</urn:facilityID>
      <urn:affirmationMessage>
        </urn:affirmationMessage>
      </urn:submitAffirmationMessage>
    </soap:Body>
  </soap:Envelope>
```

Figure 2: Sample XML SOAP Envelope for Flat File Affirmations

Production

The URL and web service credentials for production are provided to organizations at the time of promotion to production.

BiDX Testing

The BiDX testing requires your organization to test the following scenarios:

- Report child immunizations
- Report adult immunizations
- Patient does not consent to the registry
- Patient does consent to the registry using DSHS Registry Consent Forms
- Update an immunization (both historical and owned)
- Delete an immunization
- Refusal of an immunization
- Query for a child
- Query for an adult
- Query for a patient that does not exist in the registry
- Query for a patient which returns multiple patients
- Submit National Drug Code (NDC) information for administered (new) immunizations
- Submit CVX codes for historical immunizations

Your organization’s staff and EHR vendor must review the different test scenarios to confirm that all the expected outcomes and returned patient information by the

registry is accurately displayed in your EHR system. Clinical staff should take the opportunity to think about how they will deal with differences between the patient data in their EHR and patient data returned by the registry.⁶

BiDX testing is performed in a phased approach:

- Phase 1: Connectivity test to the ImmTrac2 Training Web Service
- Phase 2: Perform query tests - immunization history request and forecasting
- Phase 3: Perform vaccine reporting test – vaccine update
- Phase 4: Connectivity test to the ImmTrac2 Production Web Service

Provider and EHR vendor staff are responsible for completing all testing steps outlined in the test plan that is provided during onboarding.

Patient Query (QBP) Testing

1. Initiate queries for each of the registry test patients in the registry test environment using the registry's WSDL.
2. Send Z34 queries and Z44 queries as indicted in the TestPatient Information.
3. Receive patient information from the registry and ensure that it is fully and accurately displayed by your EHR system.

Send your envelope, message and response to the Interoperability Team for validation. Validation must be performed to determine completion of each phase of test.

Patient Immunization History (VXU) Testing

The registry releases your organization to begin patient immunization history testing.

Use the test patients you've chosen for VXU testing by submitting immunizations, owned and historical, for the registry test patients.

Send your envelope, message and response to the Interoperability Team for validation. Validation must be performed to determine completion of each phase of test.

Production

When the registry indicates that your organization has successfully completed BiDX testing, then your organization is provided with web service credentials to Production and allowed to submit live patient data. This is often referred to as "promoted to production for BiDX."

⁶ The registry only returns patient and immunization information for persons who have consented to have their data stored electronically.

The Interoperability Team discusses with you what changes are made to your file transfer protocol (FTP) account that is used currently for batch file submissions.

Contact Information

For more information about BiDX of immunization data please contact the registry's Interoperability Team:

- Email: ImmTracMU@dshs.texas.gov
- Phone: 800-348-9158, press Option 3
- Website: <https://www.dshs.texas.gov/immunize/immtrac/>