



# **Closing Immunization Data Exchange Gaps with Federal Agencies**

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FL SHOTS, Immunization Section

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# Agenda



About the IZ Gateway



Provider-IIS Onboarding



Closing Immunization Data Exchange Gaps  
with the Veterans Health Administration



IIS Perspective: FL SHOTS

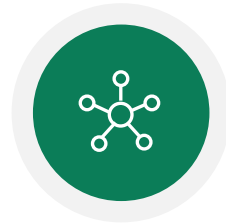
# About the IZ Gateway

# Introducing the IZ Gateway



## Message Routing Service

A cloud-based message routing service for immunization data exchange



## Centralized Data Exchange

Serves as one consolidated integration hub to facilitate data exchange through a standardized, repeatable onboarding/testing process



## Policy Infrastructure

Offers standardized policy infrastructure for data exchange between IIS and with multi-jurisdictional vaccine providers

# IZ Gateway Use Cases

1



## Exchange Data with Vaccine Providers and Patients

- Federal Agency or Multi-jurisdictional Vaccine Provider ↔ IIS
- IIS → Patient App or Patient Portal

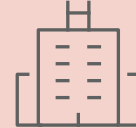
2



## Exchange Data with other IISs

- IIS ↔ IIS

3



## Share Data with CDC

- IIS → CDC

# Project Scope

To improve data exchange between federal agencies and IISs, CDC created historical and impactful data exchanges through the IZ Gateway.

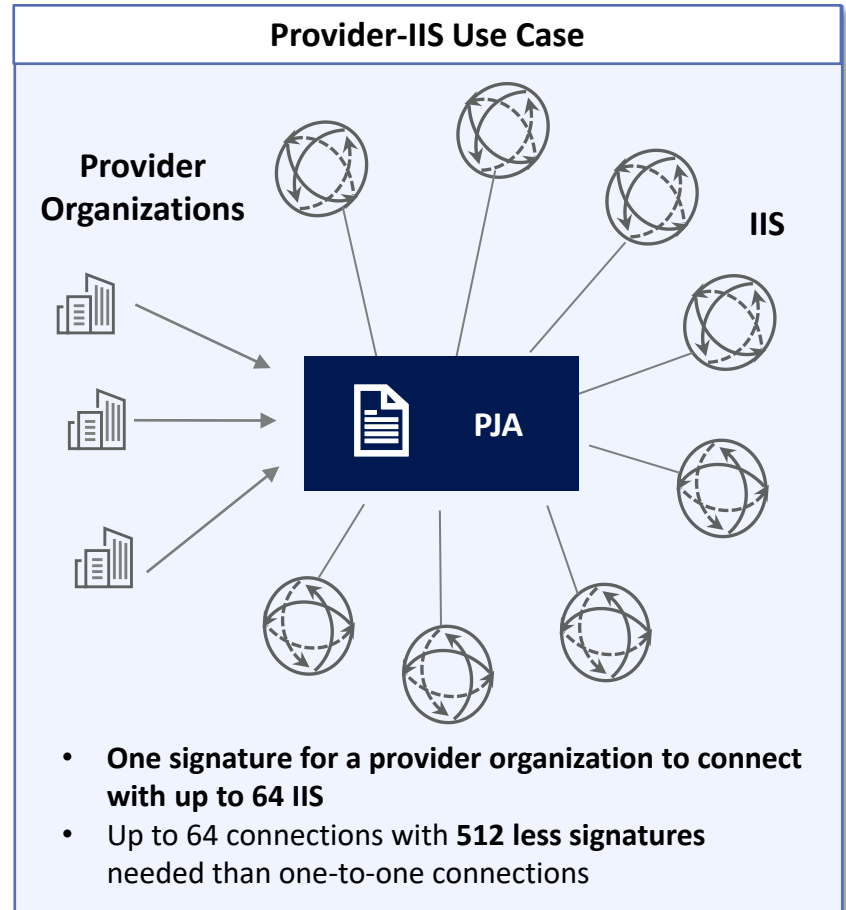
## **The federal agencies include:**

- Department of Veterans Affairs (VA)
- Department of Defense (DOD)
- Electronic Disease Notification System (EDN) Refugee Immunization Information Systems Exchange (RIISE)

These projects bridge the gap in data exchange between multi-jurisdictional agencies that have historically not shared data with public health due to policy and technical challenges, particularly for Veterans and refugees.

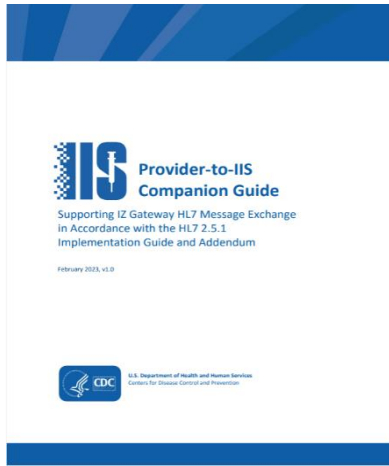
# Legal Agreements

- The CDC IZ Gateway policy framework has streamlined legal agreements required for data exchange
- The IZ Gateway agreements allow an IIS and/or provider to connect to multiple entities with a single signature per use case agreement
- This saves time and resources for providers and IISs
  - As of 4/8/24, 76% of jurisdictions have signed the IZ Gateway Provider Organization-Jurisdiction Exchange Agreement (PJA)
  - IZ Gateway supports eight provider organizations representing 4,525 healthcare facilities



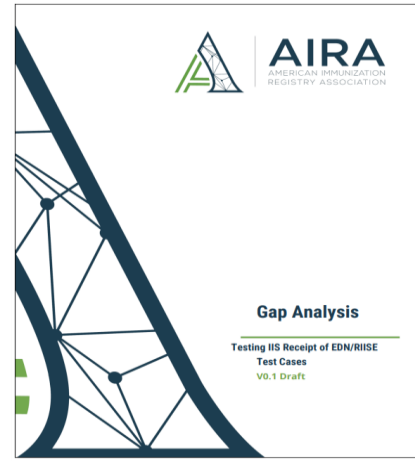
# HL7 Guidance to Support Data Exchange through the IZ Gateway

To overcome jurisdiction-specific HL7 nuances, and in collaboration with CDC and Audacious Inquiry, AIRA published multiple resources that work in concert with the National HL7 Immunization Implementation Guide (IG) and Addendum.



## [Provider-IIS Companion Guide v2](#)

Aims to support development and decision-making for provider-IIS data exchange through the IZ Gateway.

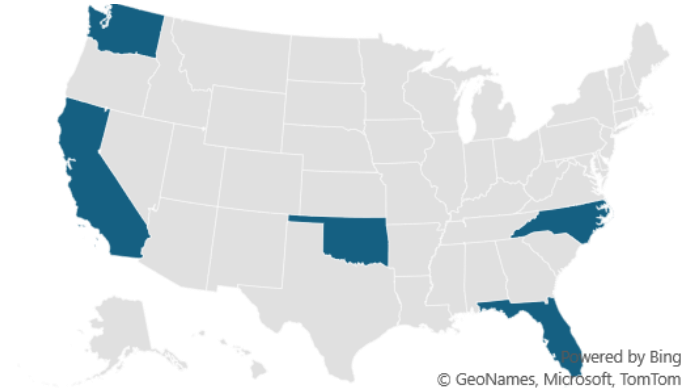


## [Gap Analysis](#)

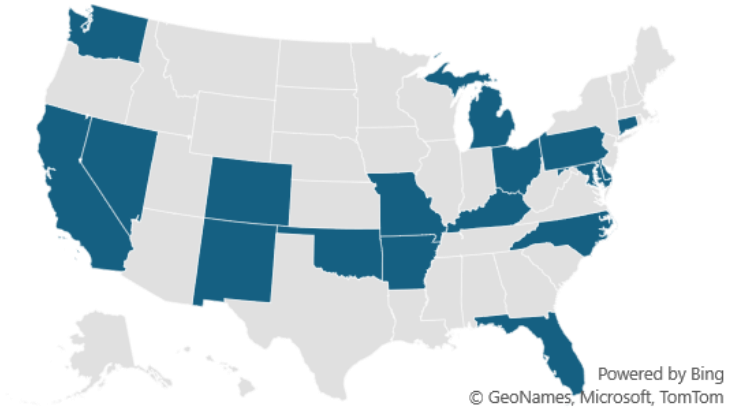
Evaluates HL7 readiness for IISs receiving provider data and highlights a gap analysis of the data elements a particular organization will send and data elements IISs expect to receive. A gap analysis is created each provider organization.

# Federal Agency IZ Gateway Data Exchange

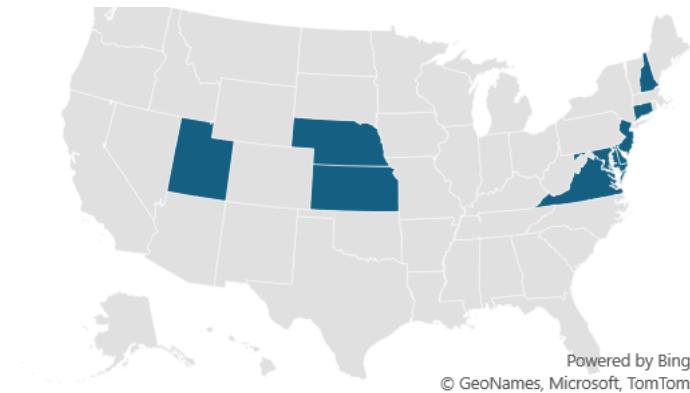
## Department of Defense (DOD)



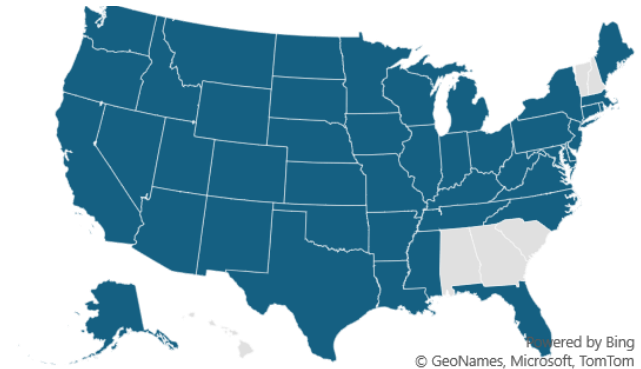
## Refugee Immunization Information Systems Exchange (RIISE)



## Vaccine Administration Management System (VAMS)



## Veterans Health Administration (VHA)



# Standardizing Provider Onboarding



## Problem:

- **Every IIS had different processes and test cases for provider onboarding**
- One provider organization testing across IISs had to navigate the different processes which is time-consuming



## What We Did:

- Standardization was created with some flexibility to accommodate unique workflows
- **Developed standard:**
  - Test cases to use with all IIS
  - Templates for kick-off, test data collection, and facility mapping
  - Testing process



## The Impact:

- Ensured consistency for provider organizations and IISs when working with the IZ Gateway
- Saved time with streamlined processes and faster data exchange connections

# Closing Immunization Data Exchange Gaps with Federal Agencies

## Department of Veterans Affairs Veterans Health Administration (VHA)

Pam Belperio PharmD, BCPS  
National Public Health Clinical Pharmacist Specialist  
Deputy Director, Health Solutions | Patient Care Services  
Department of Veterans Affairs

May 2024



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**VA**



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# VHA – Impact on Public Health and Clinical Care

Largest integrated healthcare system in the U.S.



## Over 9 million enrolled Veterans

- 6.2 million receive VA care
- ~32% receive care in the community



## 1,321 health care facilities

- 172 VA Medical Centers (VAMC)
- 1,138 outpatient sites of care
- 18 Veteran Integrated Service Networks (VISN)



## 2 Electronic Health Record (EHR) systems

- VistA: Veterans Health Information Systems and Technology Architecture
- Oracle Health Millennium (6 locations)



2021\_Enrollee\_Data\_Findings\_Report-508\_Compliant.pdf (va.gov); Integrated Veteran Care Program Office communication March 2023.  
<https://www.va.gov/health/about/VHA.asp#:~:text=The%20Veterans%20Health%20Administration%20%28VHA%29%20is%20the%20largest,Veterans%20enrolled%20in%20the%20VA%20health%20care%20program.>



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# Initiative to Integrate Immunization Data

## Before IZ Gateway

Navigating 64 individual IIS (regulations, policies, data systems)

Limited interoperability

Reliance on manual processes

Challenges in tracking

Incomplete Veteran records

## After IZ Gateway

Enterprise integration with single connection

Enhanced functionality-full automation

Elimination of manual processes

Seamless integration

Comprehensive Veteran records

## Impact and Benefits

- ✓ Public Health collaboration
- ✓ Ensure timely immunization information for Veterans and Providers
- ✓ Reduce duplicate immunizations; improve safety
- ✓ Targeted outreach and interventions
- ✓ Improved provider efficiency



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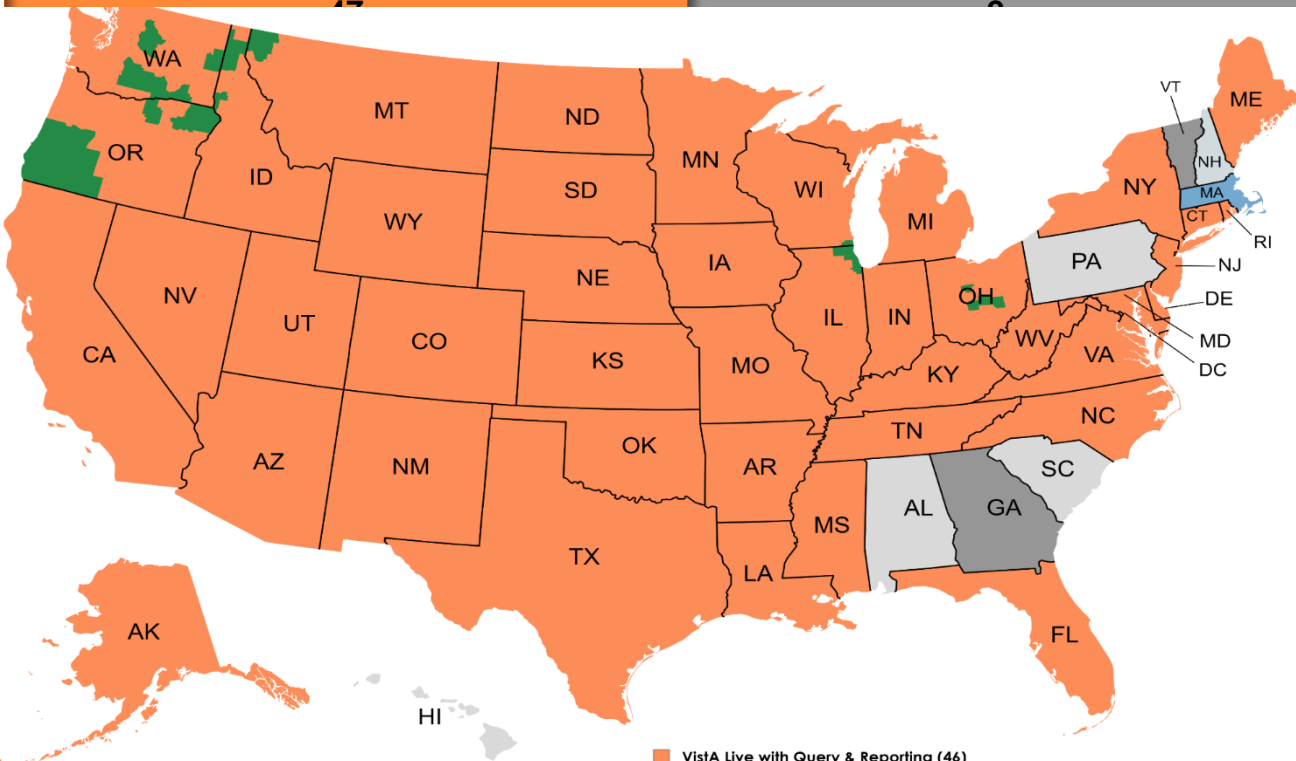


# VHA - IZ Gateway Collaboration Serves Veterans and Providers

**Live with Automated Query\* and Reporting**  
47

**Agreement signed; await IIS readiness**  
0

**Awaiting agreements**  
5



**Total Number of Vaccinations SENT to IISs via Automated REPORTING:**  
 > 6,020,791  
 for >3,999,615 Veterans

**Total Number of Vaccinations RECEIVED from IIS QUERY:**  
 > 11,546,516  
 for >2,053,058 unique Veterans

**1,122\* VHA locations sharing data across 47 states/jurisdictions**

\*1,063 VistA and 37 Oracle Health locations

\*MA: reporting only  
 VHA Health Solutions Data  
 as of 4/13/24

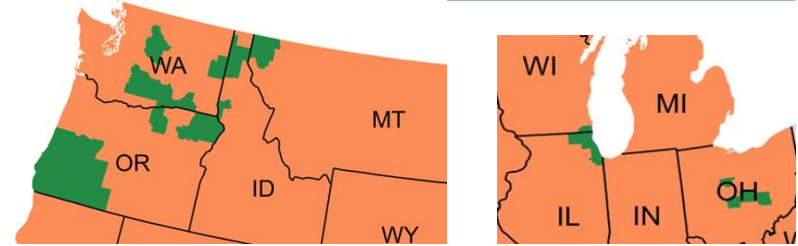
- Orange: VistA Live with Query & Reporting (46)
- Blue: VistA Live with Reporting (1)
- Green: Oracle Health Live with Query & Reporting (7)
- Grey: VistA Soon to be Live with Query & Reporting (2)
- Light Grey: No Provider Jurisdictional Agreement Signed (5)

# VHA Oracle Health IZ Gateway Implementation

- ▶ VHA Oracle Health interface connects to IZ Gateway for WA, OR, ID, MT, OH, IL and WI

Live with Automated Query and Reporting  
6 VA Medical Centers in 7 jurisdictions

Oracle – IZ Gateway - IIS Interface (date deployed)	VAMC or Clinic
WA (3/15/23)	Mann-Grandstaff, Walla Walla (8)
OR (4/26/23)	Roseburg, White City (11)
ID (4/26/23)	Coeur D Alene, Sandpoint, Lewiston Clinics
MT (4/26/23)	Libby Clinic
OH (11/8/23)	Columbus (8)
IL (3/8/24)	Lovell FHCC (3)
WI (3/8/24)	Kenosha Clinic



**Total Number of Vaccinations RECEIVED from IIS QUERY:**  
 >214,887  
 for >36,175 unique Veterans

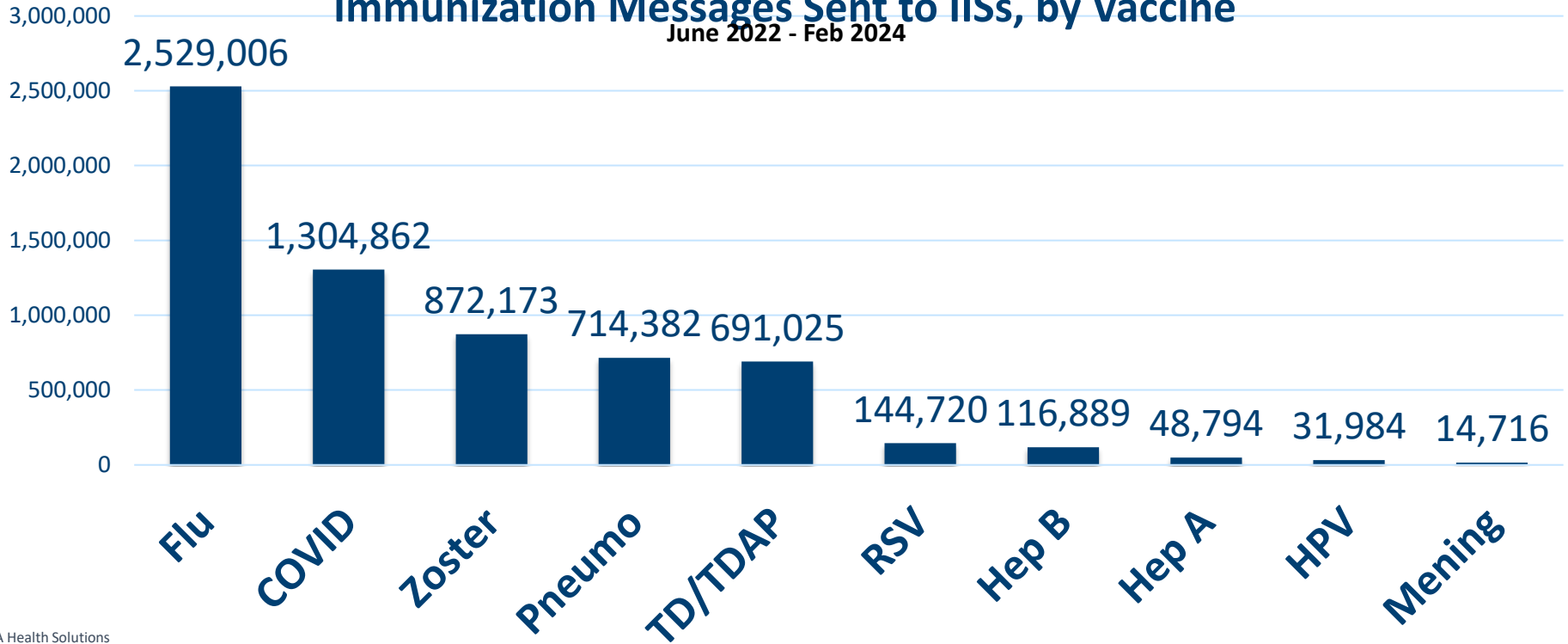
**Total Number of Vaccinations SENT to IISs via Automated REPORTING:**  
 >41,370  
 for >27,418 unique Veterans

- ▶ IZ Gateway connectivity and bi-directional data exchange **will be included in all future VHA deployments**

# Top 10: Immunizations Reported by VHA through IZ Gateway

## Immunization Messages Sent to IISs, by Vaccine

June 2022 - Feb 2024



VHA Health Solutions  
Data as of 3/1/24



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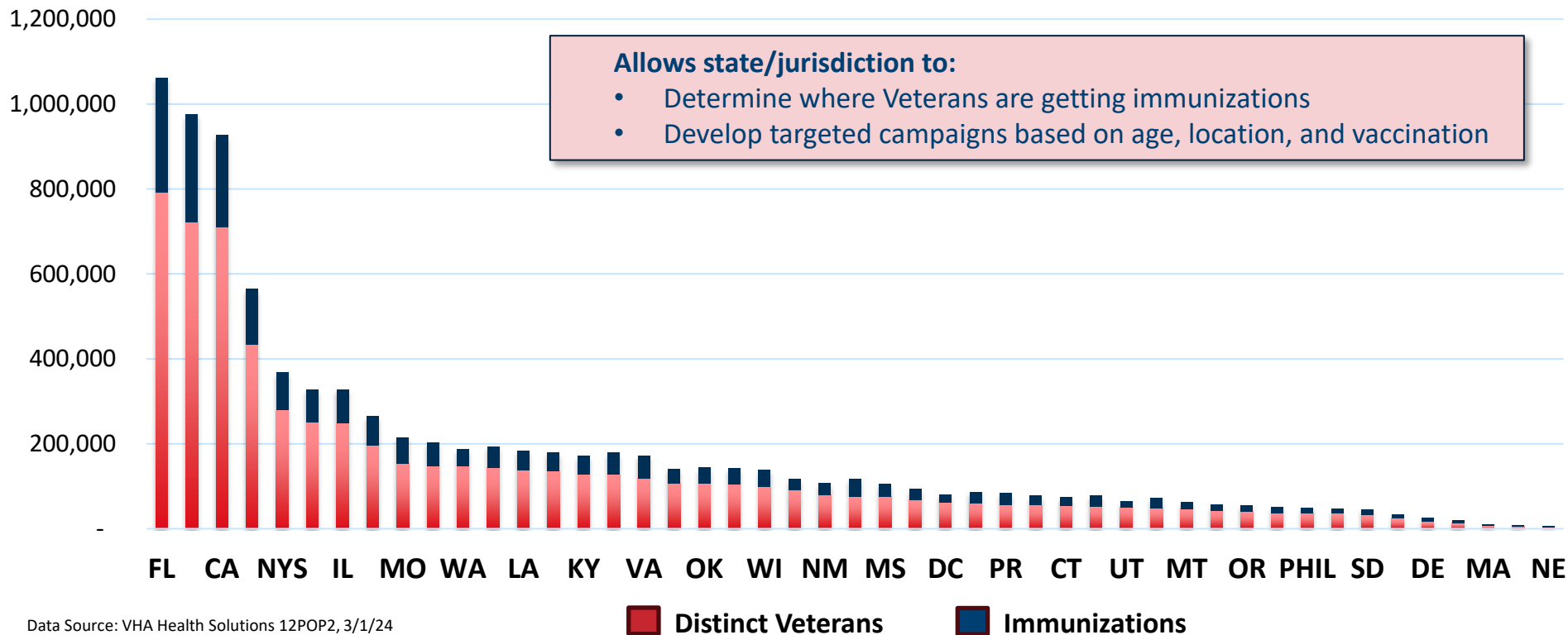
Unsolicited vaccination records (VXU) reported to 47 Live IISs

**VA**



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# Immunizations Reported by VA, through IZ Gateway, to IISs



Data Source: VHA Health Solutions 12POP2, 3/1/24



Distinct Veterans



Immunizations



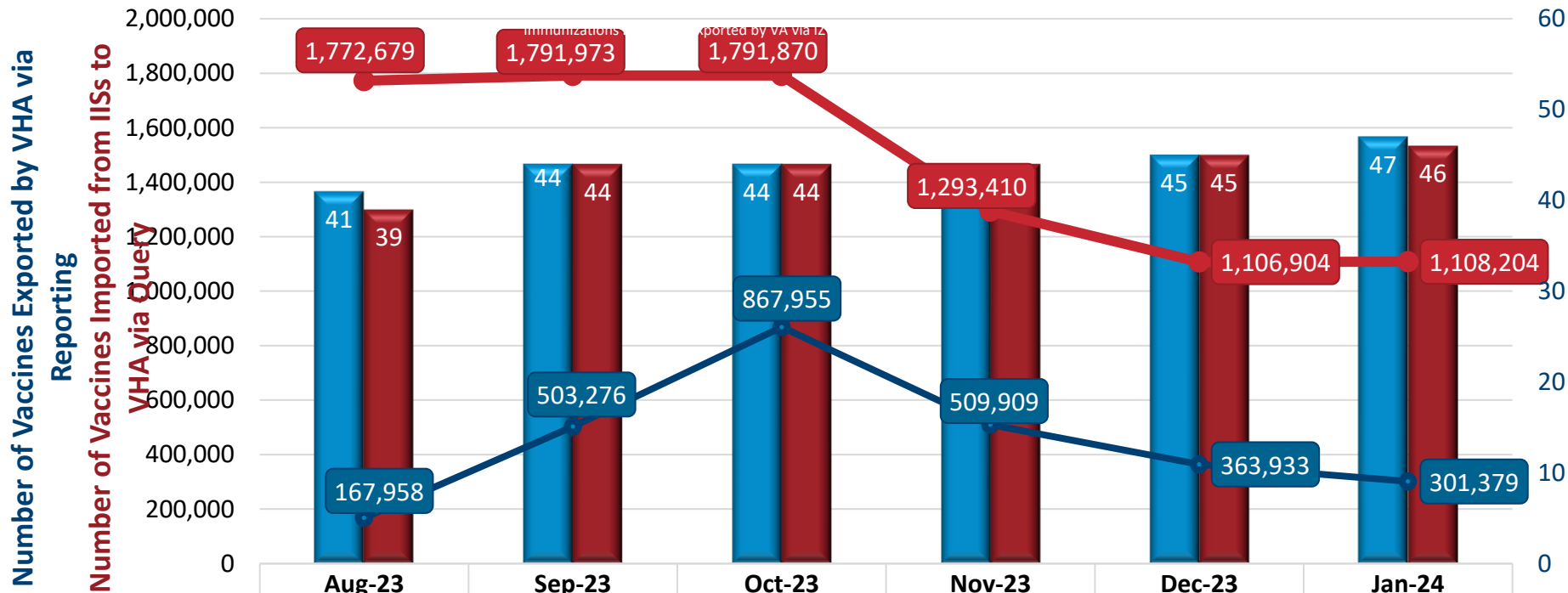
Choose VA

VA



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# Immunizations Reported and Imported via IZ Gateway, by Month



Live IISs Reporting	41	44	44	44	45	47
Live IISs Query	39	44	44	44	45	46
Imported IZs	1,772,679	1,791,973	1,791,870	1,293,410	1,106,904	1,108,204
Reported IZs	167,958	503,276	867,955	509,909	363,933	301,379



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VHA Health Solutions, Data as of 3/1/24

**VA**

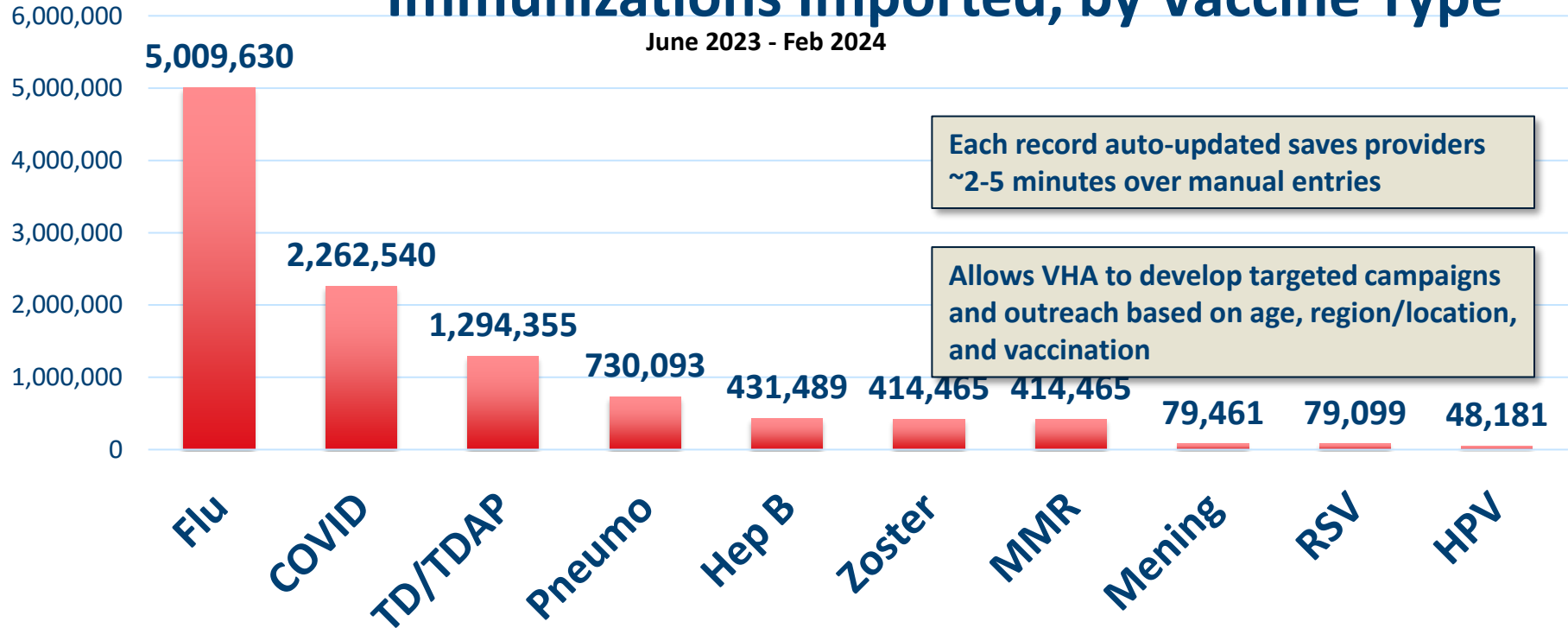


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# Top 10: Vaccines Imported to VHA from IISs via Query

## Immunizations Imported, by Vaccine Type

June 2023 - Feb 2024



Data Source: VHA Health Solutions 3/1/24



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Query by parameter (QBP) messages sent to 46 Live IISs

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# Continuous Monitoring and Improvement

Monitoring Activity	Result
Validating data within different systems, discovered some patient vaccination messages were not found in AOD table	Multiple teams held working session to identify and resolve the issue, backloaded data, built error table to be alerted if a similar even happened in the future
Deep dive into patient matching failures led to discovery that patient phone and mother's maiden name were not included in matching algorithm	8% improvement in patient matches, resulting in 1.3 million more immunizations added to patient records per year
Tracking error messages revealed messages from IIS with "PID" in the message were being rejected	~18,000 more vaccination messages EVERY MONTH being processed
Deep dive into unexpected errors associated with Datatype Validation failures	~2,500 vaccination messages every month being processed
System and application downtime	Added Re-try logic at multiple junctures
Duplicate COVID vaccines being added	Revised de-duplication logic for manually entered historical vaccinations
Non-vaccines (tuberculin PPD, rabies) sent as immunizations	Blocked sending of non-vaccines
Vaccination units sent as milligrams being consumed by IIS as milliliters	Vendor meetings to update systems to consume as reported

# Lessons Learned

## Need for standardization

- Message handling differences across jurisdictions

## VXU

- Creation of standardized VXU message
- IIS variation in HL7 elements requiring customization for multi-jurisdiction
  - Differences in MSH-4, MSH-22, RXA-11, ORC-17 → Key Fields table
- Custom ACK codes received from IIS/vendors: all “AE”s are not the same!

3	General	1. Establish and maintain active stakeholder communication to balance known project constraints: Quality, Time, Schedule, Resources and Risks. Communicate early, often, with outcomes/decisions/results well-documented. 2. Re-engage frequently with states who have onboarded and when time has elapsed before beginning implementation testing. Work jointly with CDC to keep states updated, engaged, and informed. 3. Develop a detailed Responsible, Accountable, Consulted, Informed (RACI) chart early in the project so various teams understand areas of project responsibility.
6	Vendor Impact	1. Identify IIS vendor exchange specifications early in the project. Document vendor specifications and create a vendor profile. For example, some vendors use National Provider Identifiers (NPIs) as Child Station Identifiers. Some vendors use Simple Object Access Protocols (SOAP) as Facility Identifiers. Understanding the vendor profile is a key mechanism to identify potential IIS exchange issues or barriers to IIS interoperability. 2. Include IIS vendor representatives in User Acceptance Testing (UAT) and during the State IIS onboarding process. This is helpful.

## QBP

- Differences in handling responses of too many matches/candidate list to parse ACK messages
- Inconsistent use of state abbreviation or state name → Impacts patient matching score

## General

- Inconsistent error messages returned (ACK and RSP)
- Patients with initials as first name
- Names with “boy”, “girl”, “son”, etc. in the name (think of names like “Madison”)
- Abbreviated street/city names (i.e, Colorado SPGS) → Patient address standardization using Project US@ would be beneficial



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Unable to query if we have not reported on that patient

VA



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# VHA Error Handling Dashboard

## IZGateway Utility

Lookup

VXU Errors

QBP Errors

### QBP Errors

Error Date	AcknowledgmentCode	Severity	ISCode	Message	Location	ISCode	VA SiteCode	VA SiteDescription	State IIS
2024-03-14 12:52:26	VisIA Save	O		Success : CVXCode: 150, AdministrationDate	RPC Processing	-5	662	SAN FRANCISCO VAMC	ca
2024-03-14 12:52:26	VisIA Save	O		Success : CVXCode: 309, AdministrationDate	RPC Processing	-5	662	SAN FRANCISCO VAMC	ca
2024-03-14 12:52:26	VisIA Save	O		Success : CVXCode: 217, AdministrationDate	RPC Processing	-5	662	SAN FRANCISCO VAMC	ca
2024-03-14 12:52:23	QBP Process	O		IIS did not find a matching patient. MSH[~& imp]	QBP Response		552	DAYTON	oh
2024-03-14 12:52:23	AA	I		No patients found for this query			552	DAYTON	oh
2024-03-14 12:52:19	Reverification	O		No patients found. MVI could not find a match ba			658GC	LYNCHBURG VA CLINIC	va
2024-03-14 12:52:19	QBP Process	O		IIS did not find a matching patient. MSH[~& jky]	QBP Response		803	ROBLEY REX VAMC	ky

Results: 100000+ Page: 1 2 3 4 5 ... of 4546

ErrMessage:

ErrLocation:

ErrISCode:

## IZGateway Utility

Lookup

VXU Errors

QBP Errors

### VXU Errors

Error Date	AcknowledgmentCode	Severity	ISCode	Message	Location	ISCode	VA SiteCode	VA SiteDescription	State IIS
2024-03-14 12:52:26	AE	E	204	INACCURATE OR MISSING OBSERVATION V	OBX*2*3*0	204*Unknown key ident	618	MINNEAPOLIS VA HCS	mn
2024-03-14 12:52:26	AE	E	204	INACCURATE OR MISSING OBSERVATION V	OBX*2*3*0	204*Unknown key ident	618	MINNEAPOLIS VA HCS	mn
2024-03-14 12:52:25	AE	W	101	vis publication date is missing	OBX 29768-9,6	101*Required field miss	541GJ	NEW PHILADELPHIA C	oh
2024-03-14 12:52:25	AE	W	101	vis given date is missing	OBX 29769-7	101*Required field miss	541GJ	NEW PHILADELPHIA C	oh
2024-03-14 12:52:25	AE	W	101	vaccination ordering provider is missing	ORC*1*12*1	101*Required field miss	541GJ	NEW PHILADELPHIA C	oh
2024-03-14 12:52:25	AE	I		Patient: 1005688294V180494 "WESLEY RANK		0*Message accepted*H	541GJ	NEW PHILADELPHIA C	oh
2024-03-14 12:52:22	AE	W	101	4*Invalid value*HL70533   Warning: No Assignm	ORC*1*12	101*Required field miss	640HC	MONTEREY VA CLINIC	ca
2024-03-14 12:52:22	AE	W	102	4*Invalid value*HL70533   Warning: Administere	RXA*1*10*3	102*Data type error*HL	640HC	MONTEREY VA CLINIC	ca
2024-03-14 12:52:19	AE	I		IIS_REGISTRY_ID 2355501		0*Message accepted*H	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:19	AE	I		1006*Required field missing*HL70533 PID Prim	PID*1*15*1	101*Required field miss	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:19	AE	I		1006*Required field missing*HL70533 PID Prim	PID*1*15*1*1	101*Required field miss	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:19	AE	I		1006*Required field missing*HL70533 PID Prim	PID*1*15*1*1*3	101*Required field miss	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:19	AE	I		1023*Message Item Match-List failed to match c	OBX*2*5*1*1	103*Table value not four	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:19	AE	I		1006*Required field is missing or Message Item	PID*1*14*1*2	101*Required field miss	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:19	AE	I		1006*Required field missing*HL70533 ORDER I	RXA*1*10*1*3	101*Required field miss	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:19	AE	W		1006*Required field missing*HL70533 PID MoTh	PID*1*6*1*2	101*Required field miss	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:19	AE	E		1023*MSH4 sending facility does not match with	PID*1*3*1*4*1	103*Table value not four	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:19	AE	E		10218*PATIENT CONSENT IS MISSING. REQU	PD1*1*12*1	101*Required field miss	561GJ	PATERSON CBOC	nj
2024-03-14 12:52:10	AE	W		WIR recommends specification of NDC.	RXA*1*5*1*1	102*Data type error*HL	676	TOMAH VAMC	wi
2024-03-14 12:52:10	AE	I		Informational message - Administering provide	RXA*1	102*Data type error*HL	676	TOMAH VAMC	wi
2024-03-14 12:52:00	AE	W		4*Invalid value*HL70533   Warning: No Assignm	ORC*1*12	101*Required field miss	570	FRESNO VA MEDICAL	ca
2024-03-14 12:52:00	AE	W		4*Invalid value*HL70533   Warning: Administere	RXA*1*10*3	102*Data type error*HL	570	FRESNO VA MEDICAL	ca

Results: 100000+ Page: 1 2 3 4 5 ... of 4546

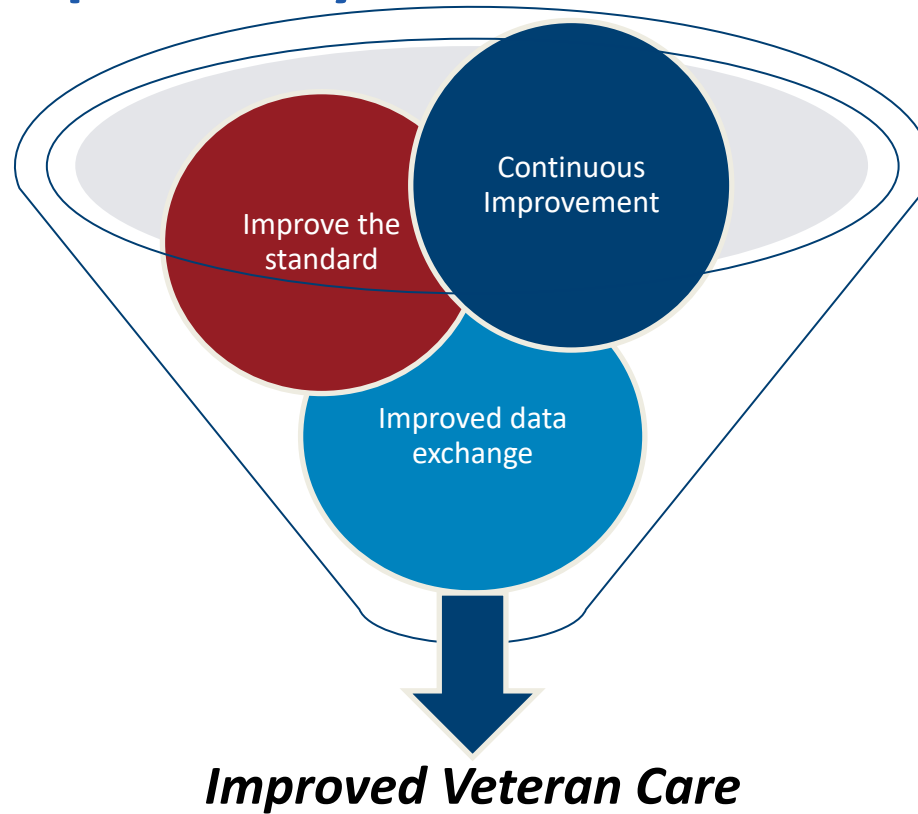
ErrMessage:

ErrLocation:

ErrISCode:



# Improve Interoperability



# IZ Gateway Use Case: FL SHOTS IIS

# Before IZ Gateway

## ✓ Prior to IZ Gateway project with VHA

- VA facilities enrolled in Florida SHOTS as an individual “organization”
- Veteran’s immunization data was spread across multiple organizations corresponding to the VA facilities in Florida
- Not all VA facilities were enrolled in Florida SHOTS
- Vaccinations administered at unenrolled facilities were not recorded in Florida SHOTS resulting in incomplete patient immunization record
- Unable to determine a true count of vaccinations administered across all VA facilities

# After IZ Gateway Connections

- ✓ **With IZG, we were able to consolidate the individually enrolled VA facilities into one organization and began to receive data under that organization**
  - An umbrella VA “organization” was setup to receive data from VHA through IZ Gateway
  - 87 service sites were setup, each corresponding to 87 VA facilities across Florida
  - Flexible enough to expand as more VA facilities are set up
  - Receiving vaccination data from all VA facilities

# IZ Gateway and FL SHOTS In Action

## ✓ Timeline

- Receive vaccination administered data from VA facilities through IZ Gateway
  - Testing began June 13, 2022
  - Went live in production on June 27, 2022
- VA facilities querying Florida SHOTS for patient immunization history and recommendations
  - Testing began July 7, 2022
  - Went live in production on Sept 6, 2022

## ✓ Some numbers\*

- Received 674,318 vaccine administration (VXU) transactions messages
- Received 2,233,010 query messages (QBP) for patient immunization history and recommendations

\* Source Florida SHOTS 3/18/24

**In Conclusion**

# What is Next for the IZ Gateway?

The IZ Gateway is looking forward to continuing to improve data exchange with federal providers to enhance IIS and provider data completeness

## VHA VistA

- By August 2024, onboard remaining 6 jurisdictions to exchange data with VHA VistA via the IZ Gateway

## DOD

- By August 2024, DOD will be exchanging data with 9 jurisdictions via the IZ Gateway.
- The CDC plans to support DOD in garnering approval to expand the project to additional jurisdictions.

## EDN

- By August 2024, EDN will be exchanging data with 41 jurisdictions via the IZ Gateway