



Pennsylvania
Department of Health

PIERS

Pennsylvania Immunization Electronic Registry System

HL7 Errors at Scale

Lessons from Pennsylvania's IIS Migration

April 30, 2026

Eli Blumenthal

PIERS Project Manager

PIERS Registry Specialist Supervisor

HL7 and Data Interoperability

Contents

- HL7 Overview for Pennsylvania
- Pennsylvania's IIS Migration
 - Legacy IIS to WebIZ
- Migration Considerations
 - Timeline
 - Resources and requirements
 - Risks
- EMR Prioritization
- Additional Actions to support initial onboarding
- Continuing improvement efforts



HL7 in Pennsylvania

- 98.5% of new Patient Immunizations in PA submitted via HL7
- 150k VXU Messages per week
- 1.5 Million QBP Messages per week
- Over 1,000 active parent HL7 senders across Pennsylvania
- Parent-Child Clinic set up
- 4,700 HL7 facilities with admins

Parent Provider Healthcare Org
MSH-4 - Username/Pass

Clinic 1
RXA-11.4

Clinic 2
RXA-11.4

Clinic 3
RXA-11.4



Legacy IIS to WebIZ

Legacy IIS

- Pros
 - Barebones/Simple
 - Direct Table Read/Write
 - Fast Transactions
- Cons
 - Confusing Interface
 - Lacking additional features
 - Outdated

WebIZ

- Pros
 - Much more comprehensive
 - Well-maintained
 - Configurable
 - Great Support
- Cons
 - No direct table access (resolved)
 - Some performance issues (resolved)



HL7 Onboarding Timeline

- Onboarding began May 2023
- Scheduled go-live of January 2024
- Approximately 1200 HL7 Sending Facilities
- Direct facility testing and onboarding
- Testing Plan of 6 messages successful messages per facility
 - VXU: Single, Combination, Historical and Delete
 - QBP: Single, Multiple



Resources

- Great support and guidance from Envision Technologies
- New HL7 Testing Guidance drafted by PA staff
- 4 staff members (reduced to 3)
- Monitoring managed with simple excel sheet
- Almost all communication occurring via Email



Some Rough Math

Requirements:

1200 HL7
Senders

6 Test
Cases Per
Sender

6 Months
until
Go-Live

Resources:

≈ 3 HL7
Registry
Staff

Basic Tools
(excel &
email)

7200 Tests in Total
Staff approving 4 providers per day



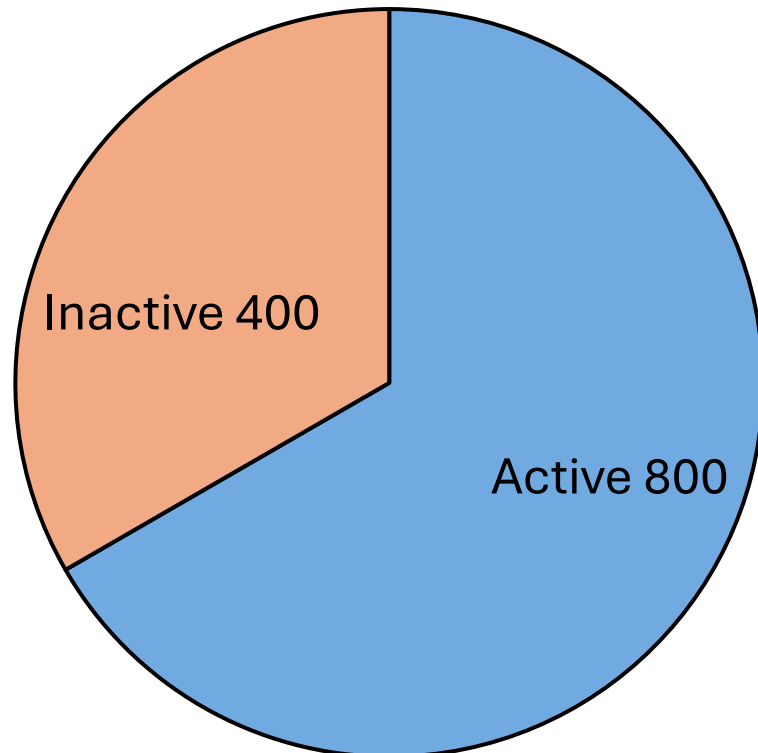
Reigning in the Risk

- Remove inactive senders
 - Identified 400 clinics with outdated information
- Identify potential prioritization options
 - High volume senders
 - Grouping clinics to simplify testing
- Improve communication channels
- Provide additional resources for self-service



Removing Inactive Senders

1200 Facilities with HL7 Transactions



- Mass email
- 2 week deadline
- Non-responders removed

Inactive Senders:

- Outdated contact/clinic information
- No HL7 Communication in past 180



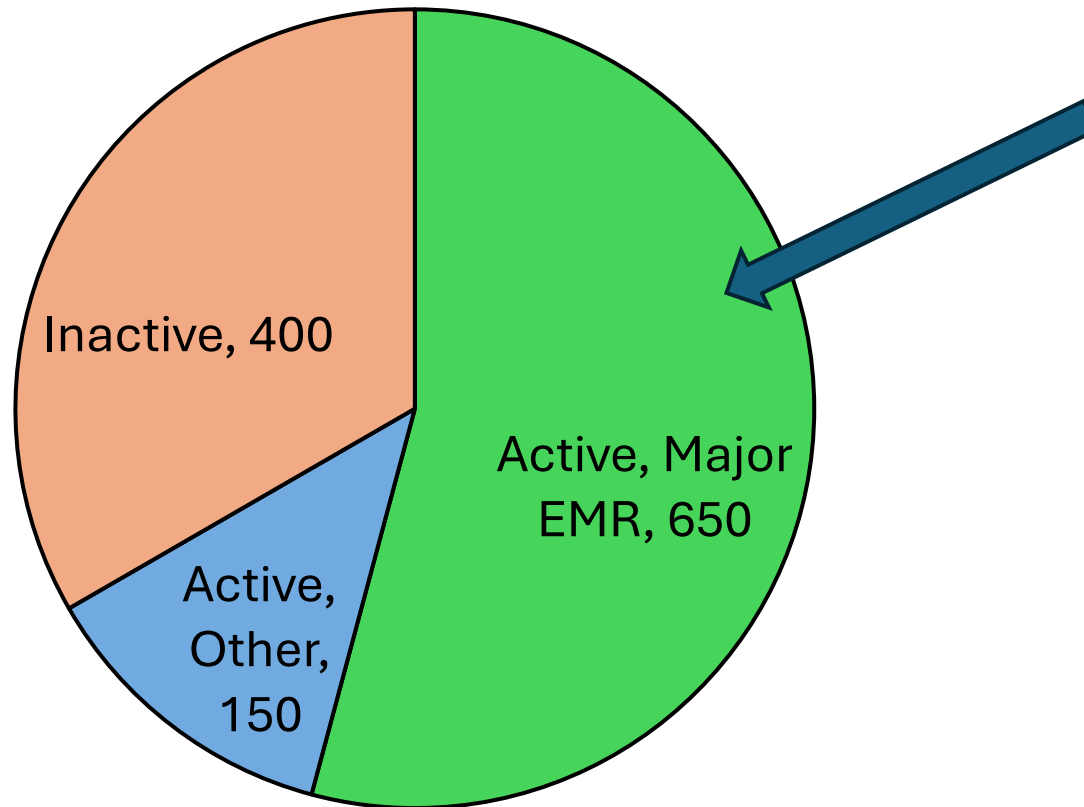
EMR Prioritized Workflow

- 16 EMR vendors identified
- 6 tests from 5 clinics each
- Advantages
 - Accounted for over 80% of active HL7 senders
 - Decreased error resolution time substantially
 - Improved overall ability to monitor and validate testing status
- Challenges
 - Validating clinic lists with EMRs and providers
 - Establishing good contact points
 - Validating that changes would be deployed to all interfaces in PA



EMR Prioritized Workflow

1200 Facilities with HL7 Transactions



- Testing requirement for 650 Clinics reduced to 80 Clinics

Other Action

- Weekly HL7 Office Hours for EMR vendors and Providers
- HL7 Testing FAQ created
 - Including common error codes and how to resolve
- Mailing list for regular updates and testing reminders



Results

- >95% of active sending providers were onboarded in the 6 months prior to go-live
- Successful launch of WebIZ on schedule
 - Removed ~8 Million patient duplicates
 - Decreased duplicate incidence rate
 - Improved HL7 response quality
- Data quality issues persisted post-go-live
- High error volume at go-live
 - 70% Performance Score in WebIZ
 - Mostly resulting from repeat messages from some providers
- Volume of HL7 messages was problematic
 - Repeat HL7 messages clogging log



Improvements Since Go-Live

- Overall improvement of message quality
 - Envision reporting tools made it easy to identify and fix problem senders
- Limiting of HL7 message log
 - Introducing archiving to improve performance
- Increased access to our data via SQL
 - Allowed automated reports via email



Continuing improvements

- Utilizing Data tools to streamline HL7 error resolution
 - SQL endpoint for daily reports
 - Dashboards for message quality and error analysis
 - Monitoring HL7 'Performance Score'
- Identifying and monitoring mandatory reporters to ensure requirements are met
 - Encouraged cross-team communication within our bureau
 - Provides good framework for expanding to all providers
- Additional HL7 log improvements
 - More direct field searches (RXA-11.4)



For the future

- Resuming Office Hour meetings
- Launching quarterly newsletter
- Maintaining and expanding use of technical contact list
- Improved Resources
 - SOP and Management for EMR Transitions
 - Updated Testing and Implementation Guides
 - Online forms for HL7 transmission requests



Acknowledgements

- Envision Technologies
- PIERS and VFC Staff
- EMR and Clinic Staff around PA

