

---

# Development of a Provider Facing HL7 Dashboard in New York City

Melissa Mickle-Hope, MPH, Director, CIR, NYC Department of Health & Mental Hygiene

Megan Tougher, Project Manager, HLN Consulting

AIRA National Meeting,

Orlando, Florida

May 7, 2024

# Outline

- Citywide Immunization Registry (CIR) Background
  - HL7 Web Service
- Dashboard Setup & Development Details
- Dashboard Walkthrough
- Challenges
- Future Development

# CIR Background

- NYC's immunization information system (IIS)
- Started 1996; implemented citywide 1997
- NYC providers mandated to report immunizations for patients 0-18 years
  - Reporting for adults  $\geq 19$  years requires consent
- >14.8 million patient records
- >170 million immunizations
- Population-based
  - Load birth certificate data twice weekly

# Provider Reporting

- HL7 Web Service: 89% of CIR reporting
  - Real-time reporting from Electronic Health Records (EHRs)
  - Also supports real-time query/response
- Online Registry: 11% of CIR reporting
  - Web-based user interface

# CIR HL7 Web Service

- 3,200+ providers are connected to CIR's web service
- 2023 HL7 statistics
  - ~21 million VXUs
    - VXU: Messages containing immunization information
  - ~298 million QBPs
    - QBP: Messages sent to query the database
  - ~9.4 million immunizations sent

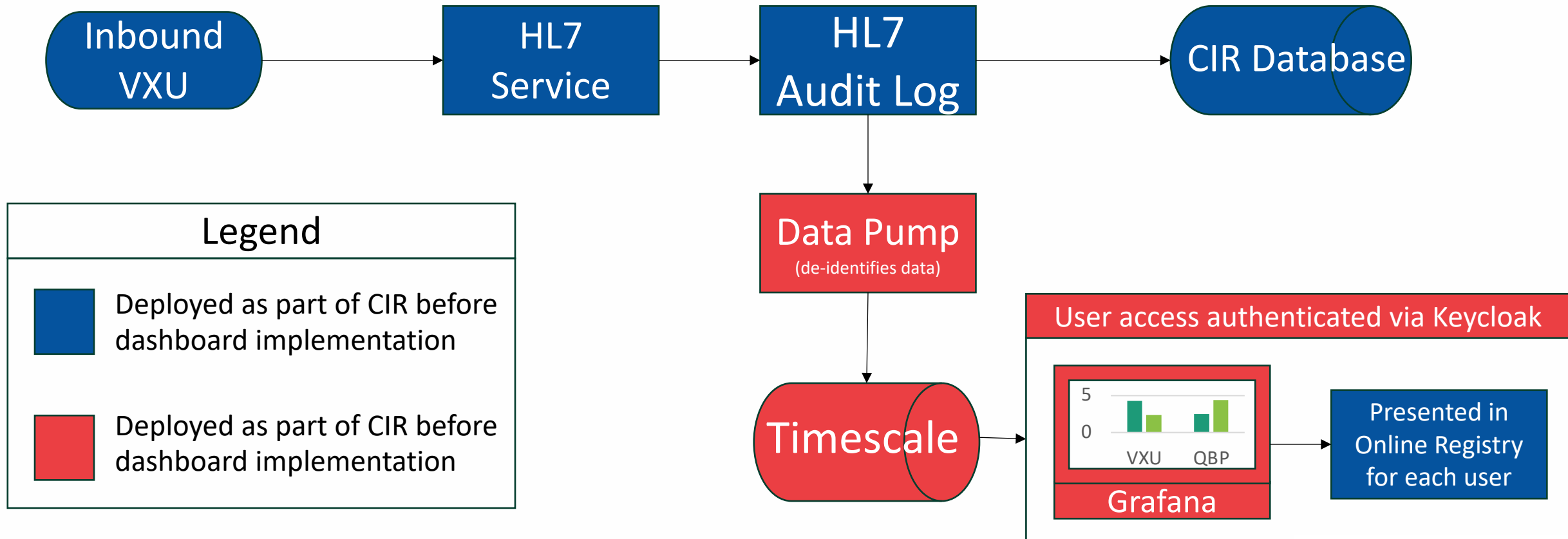
# HL7 Dashboard Objectives

- Identification of reporting errors, especially for new providers onboarding to the HL7 web service
  - Fields providers often miss:
    - Race/ethnicity
    - Cell phone
    - Next of kin first name
- Allow providers to track their reporting performance over time

# Partnership with HLN Consulting

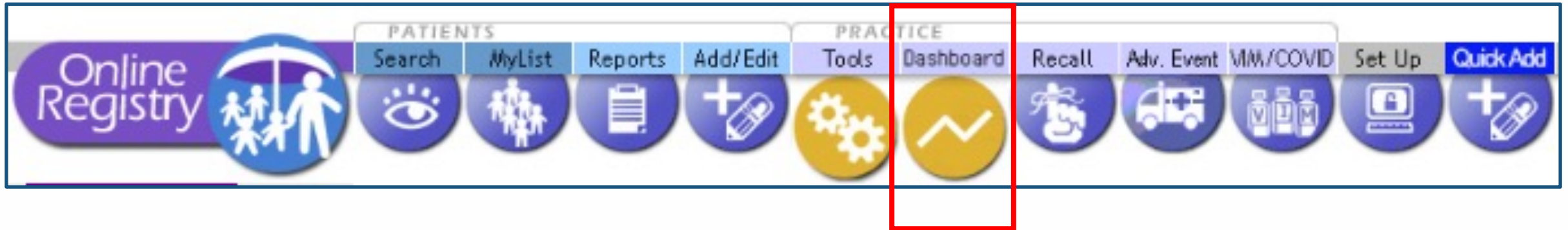
- HLN has provided software development and support services to the CIR continuously since the year 2000
- CIR owns the copyright for all of its source code
- CIR has shared some of its open-source components
  - Immunization Calculation Engine (ICE)
  - IZG Client (Foreign Jurisdiction Service) used for IZ Gateway

# Technology Behind Dashboard





# Online Registry



**HL7 dashboard data only available for sites reporting  
via an EHR**

# Dashboard Content



## Home Page

- High-level submission trends including message counts, date of first and most recently submitted reporting and querying messages



## Data Quality

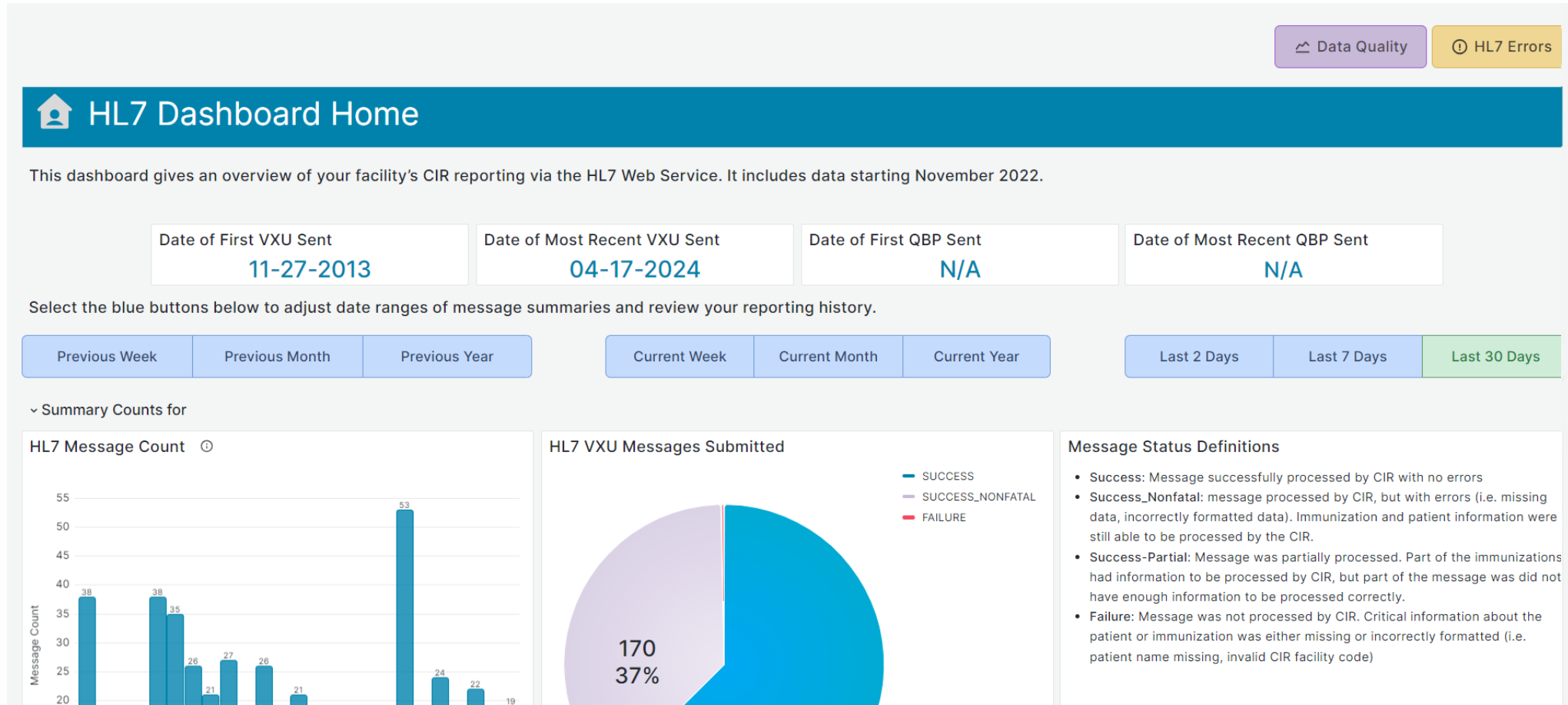
- Data completeness, timeliness of submissions, and accuracy (e.g., missing race/ethnicity values)



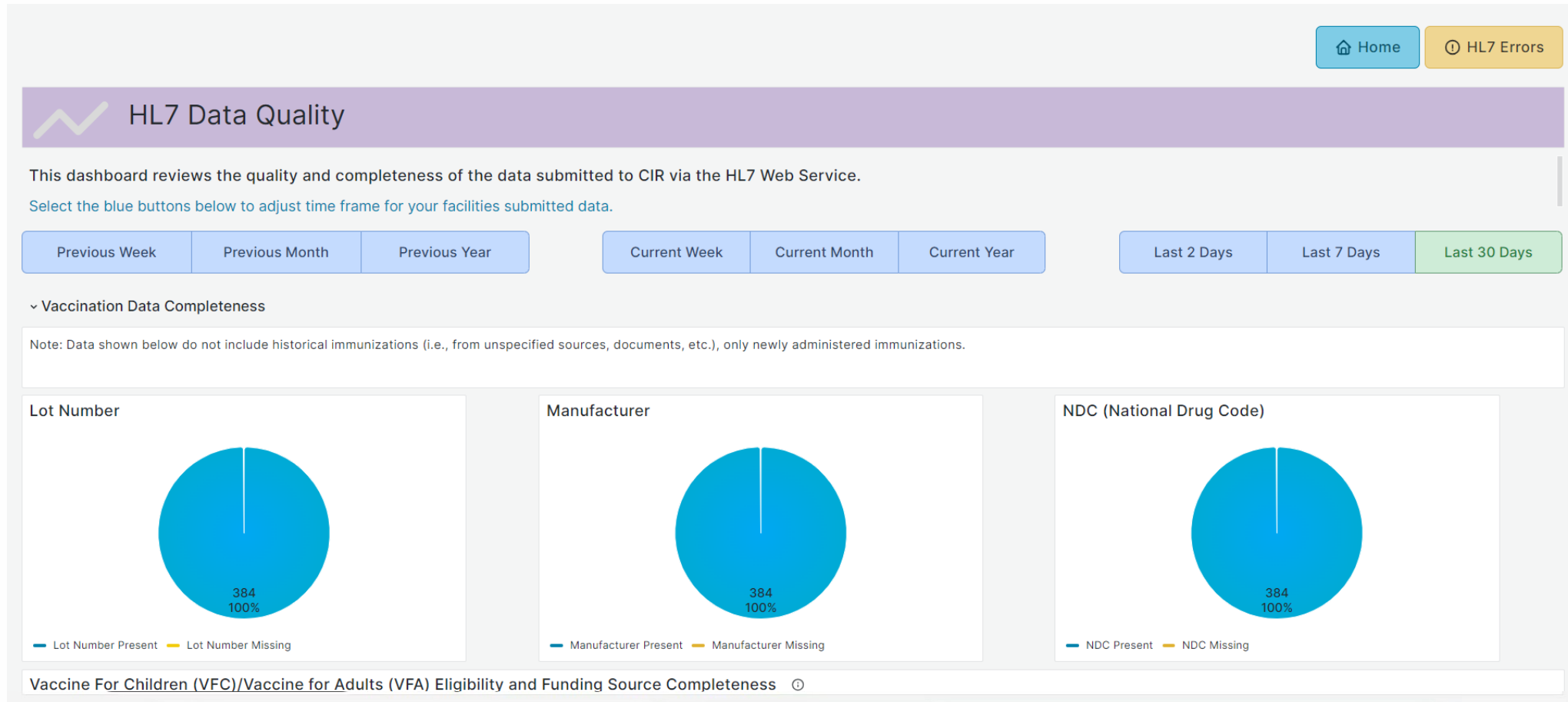
## HL7 Errors

- Details on both fatal and non-fatal errors

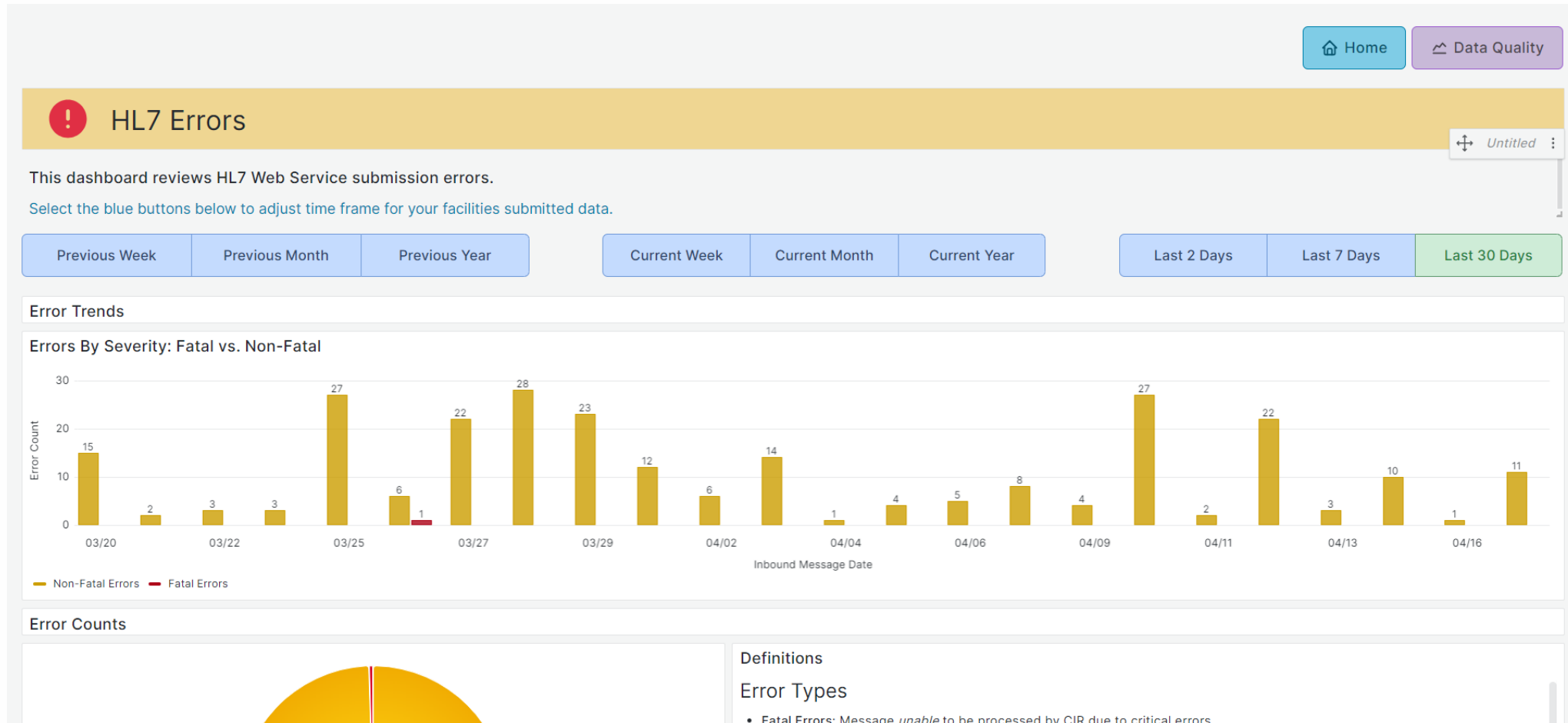
# Home Page



# Data Quality



# HL7 Errors



# Dashboard Data Content Caveats

- Aggregations are only counting new administrations
  - i.e., RXA-9 = 00
- Dashboard data is captured as it is being logged to the HL7 service (prior to it reaching the CIR database)
- Data is aggregated for each administering facility (RXA-11.4) and not for each sending responsible facility (MSH-4)

# Provider Follow-Up

- Review the dashboard
- Identify fatal and non-fatal data transmission errors
- Identify gaps in reporting
- Work with EHR vendor to correct reporting issues
- Reach out to CIR staff for assistance

# Challenges

- Open-source technology has limitations
  - Functionality in some cases required special development
    - Example: buttons across dashboard
- Sharing data with EHR vendors
  - Potential future optimizations:
    - Restructure account access to share data via sending facilities (MSH-4) rather than administering facility (RXA-11.4)
    - Have facilities create accounts for vendor representatives to access facility data



# Conclusion

- Dashboard has been received well by providers
- User Metrics
  - As of April 2024, 475 facilities have viewed the dashboard
  - Over 1,050 total views of the dashboard

# Facility Types Accessing Dashboard

Facility Type	Count	%
Private Providers	231	48.8
Federally Qualified Health Centers-Community Health Center	72	15.2
Pharmacy - Retail, not affiliated with clinical setting	57	12.1
School Based Health Center	27	5.7
Outpatient	19	4
Clinic - Offsite/Satellite	10	2.1
Miscellaneous Facility Types	59	12.4
<b>Total</b>	<b>475</b>	<b>100</b>

# Future Development

- Deployment of Provider Quarterly Report Dashboard
  - UTD Rates
    - Childhood
    - Adolescent
    - Influenza
  - VFC vaccine accountability metrics
  - Provider citywide percentile ranking

# Thank You!

- Stan Markov
- Gita Prabhakar
- Youseline Cherfilus
- Shirley Huie
- Alexandra Ternier