Office of the National Coordinator for Health Information Technology

Modernizing Public Health Data Exchange: Lessons Learned and Tools for the Road Ahead

Welcome and Opening Remarks

- Steve Posnack (ONC)
- Jennifer Layden (CDC)

Current State of Public Health Exchange: National View

Vaishali Patel (ONC), Elizabeth Ruebrush (ASTHO) and Julia Adler-Milstein (USCF)

Office of the National Coordinator for Health Information Technology

Hospital and Physician Perspectives on Public Health Data Exchange

September 21, 2023

Vaishali Patel PhD MPH & Chelsea Richwine PhD

Study Elements

Hospital Public Health Reporting

- This study uses nationally representative data on U.S. non-federal acute care hospitals (*N* = 2,541) from the **2022 American Hospital Association Survey IT Supplement** to:
  - Describe non-federal acute care hospitals' **active engagement in required and optional electronic public health reporting**
  - **Highlight progress** in in electronic public health reporting since 2021
  - **Identify ongoing challenges** to electronic public health reporting that may hinder hospitals' capacity to support PHAs' ability to effectively respond to public health emergencies.
  - ONC Data Brief no. 66
    - https://www.healthit.gov/data/data-briefs/progress-and-ongoing-challenges-electronic-public-health-reporting-among-non

Physicians' Experiences with Immunization Information Data Exchange

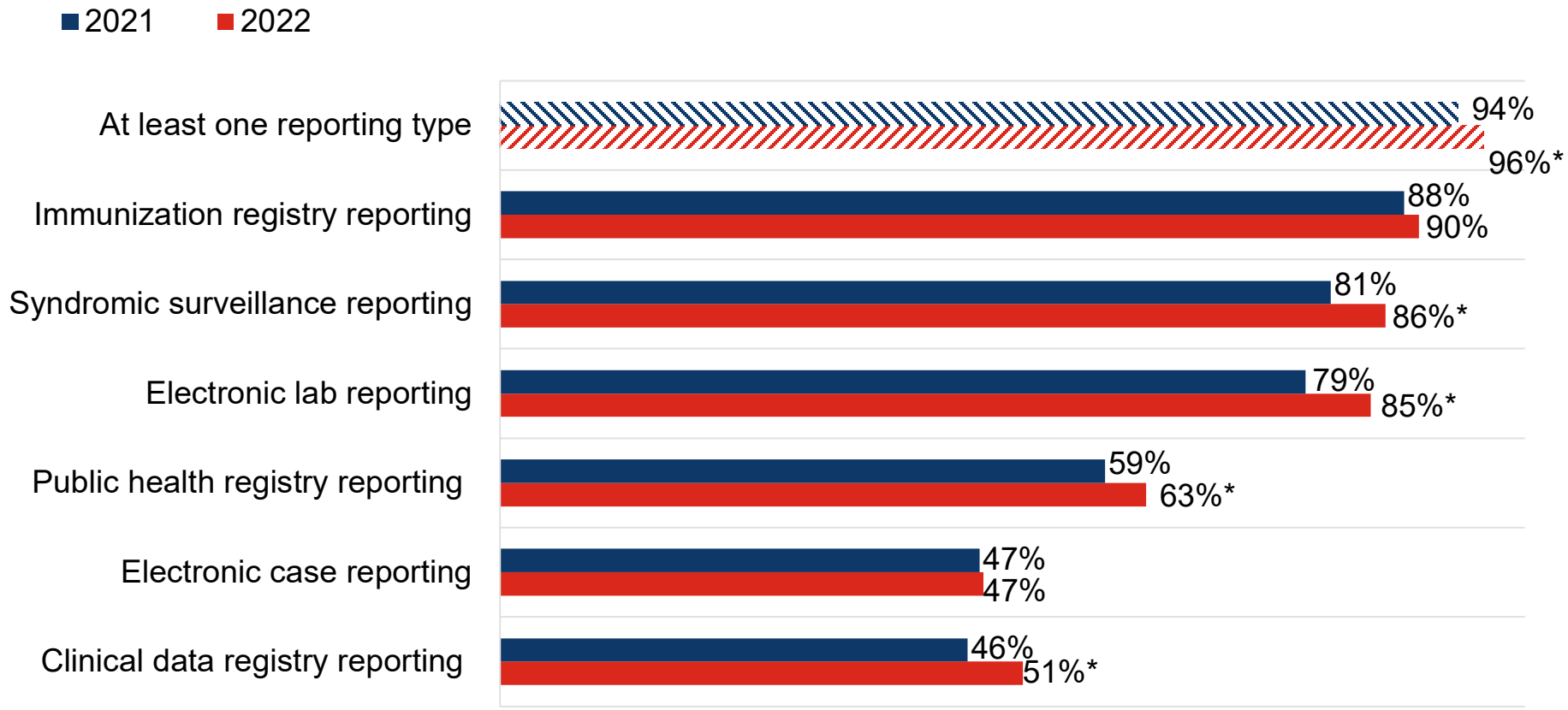
- This study uses national data on family medicine physicians (*N* = ~ 2,000*) from the **American Board of Family Medicine's 2022 Continuous Certification Questionnaire** to:
  - Describe physicians' experiences electronically **reporting** data to state immunization information systems (IIS) and **accessing** and **viewing** these data from the IIS and other outside sources.
  - Understand physicians' **satisfaction** with their electronic **access to immunization** information from outside sources.

* (*N* = 2,088 for satisfaction questions and *N* = 2,066 for access, viewing, reporting to IIS questions)

Hospital Public Health Reporting

In 2022, nearly all hospitals were actively engaged in at least one type of public health reporting.

Percent of non-federal acute care hospitals' actively electronically submitting production data for public health reporting, 2021-2022.



Mean number of public health reporting types, by hospital characteristics, 2022.

Hospital Characteristics	Mean Number of Reporting Types (Out of 6)
National Average	4.2
Size	
Small < 100 beds (N=1,228)	3.84*
Medium 100-399 beds (N=990)	4.44*
Large > 400 beds (N=323)	4.81
Ownership	
Government (N=486)	3.50*
For-profit (N=325)	3.91*
Non-profit (N=1,729)	4.45
Location	
Rural (N = 988)	3.73*
Suburban-Urban (N = 1,553)	4.47
Critical Access	
Yes (N = 721)	3.69*
No (N = 1,820)	4.38
System Affiliation	
Independent (N = 662)	3.59*
System member (N = 1,879)	4.45
Certification	
Not certified (N=119)	2.89*
Certified EHR (N=2,422)	4.21

Hospitals' engagement in electronic public health reporting varied by hospital characteristics

Appendix Table A1: Percent of non-federal acute care hospitals actively engaged in electronic public health reporting by state, 2021.

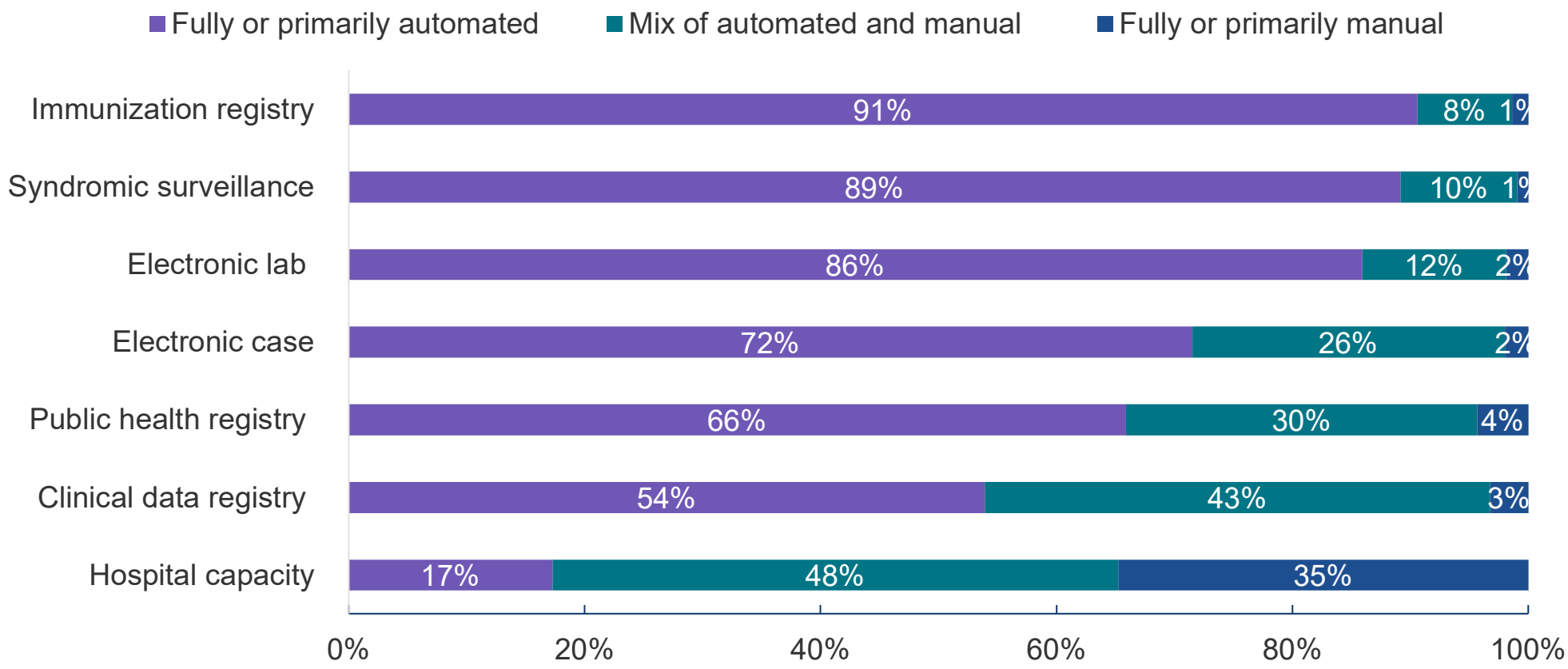
State	Syndromic surveillance	Immunization registry	Electronic case	Public health registry	Clinical data registry	Electronic reportable laboratory result	# Hospitals in IT Survey	# Hospitals in State	% Hospitals Surveyed
AK	82%	82%	44%	66%	39%	82%	5	26	19%
AL	78%	85%	40%	60%	58%	80%	30	117	26%
AR	90%	92%	45%	48%	49%	85%	43	104	41%
AZ	92%	90%	14%	24%	61%	72%	31	112	28%
CA	59%	93%	54%	52%	41%	91%	135	415	33%
CO	65%	85%	63%	65%	54%	77%	52	106	49%
CT	100%	85%	28%	35%	41%	100%	19	42	45%
DC	54%	100%	54%	54%	54%	84%	6	14	43%
DE	100%	100%	53%	74%	74%	100%	4	13	31%
FL	98%	100%	61%	78%	29%	95%	134	252	53%
GA	85%	100%	40%	57%	19%	73%	69	173	40%
HI	25%	46%	41%	58%	62%	46%	10	28	36%
IA	31%	90%	38%	52%	45%	76%	63	122	52%
ID	92%	81%	47%	55%	32%	92%	11	52	21%
IL	93%	98%	26%	46%	50%	69%	101	208	49%
IN	93%	95%	24%	52%	56%	92%	66	161	41%
KS	78%	76%	39%	69%	42%	65%	66	151	44%
KY	84%	88%	44%	82%	20%	76%	36	121	30%
LA	93%	96%	39%	60%	52%	91%	36	204	18%
MA	83%	100%	49%	62%	51%	94%	38	102	37%
MD	78%	97%	52%	56%	53%	100%	31	63	49%
ME	71%	78%	26%	69%	69%	86%	23	39	59%
MI	92%	98%	41%	65%	70%	89%	60	161	37%
MN	59%	97%	66%	66%	76%	72%	86	140	61%
MO	77%	78%	53%	49%	42%	65%	104	142	73%
MS	80%	54%	23%	42%	33%	66%	32	112	29%
MT	53%	66%	24%	40%	26%	42%	18	65	28%
NC	94%	58%	54%	42%	51%	71%	62	136	46%
ND	100%	95%	65%	40%	31%	100%	14	49	29%
NE	81%	87%	23%	61%	47%	84%	37	100	37%
NH	80%	34%	46%	41%	18%	67%	17	31	55%
NJ	93%	93%	69%	71%	81%	90%	34	98	35%
NM	83%	90%	13%	57%	15%	58%	19	55	35%
NV	88%	89%	58%	57%	21%	80%	12	60	20%
NY	92%	95%	43%	63%	58%	92%	84	208	40%
OH	94%	96%	71%	79%	70%	88%	91	222	41%
OK	51%	66%	53%	58%	52%	63%	51	146	35%
OR	85%	100%	24%	45%	75%	91%	18	65	28%
PA	99%	96%	51%	76%	75%	83%	94	230	41%
RI	100%	100%	21%	21%	49%	84%	6	15	40%
SC	74%	84%	55%	68%	41%	58%	29	89	33%
SD	86%	92%	57%	56%	54%	93%	30	64	47%
TN	90%	100%	38%	69%	31%	77%	42	131	32%
TX	84%	89%	50%	66%	34%	75%	173	603	29%
UT	43%	49%	36%	38%	2%	45%	34	59	58%
VA	100%	100%	89%	81%	39%	98%	36	122	30%
VT	65%	100%	36%	35%	100%	82%	8	17	47%
WA	91%	86%	46%	56%	49%	70%	31	105	30%
WI	87%	94%	49%	54%	56%	89%	87	150	58%
WV	100%	100%	52%	22%	16%	70%	30	61	49%
WY	66%	61%	11%	48%	31%	31%	16	32	50%

Hospitals' engagement in electronic public health reporting varied by state (2021)

Richwine C., Everson, J., & Patel, V. (September 2022). Electronic Public Health Reporting among Non-Federal Acute Care Hospitals During the COVID-19 Pandemic, 2021. *ONC Data Brief, no.62*. Office of the National Coordinator for Health Information Technology: Washington DC. https://www.healthit.gov/data/data-briefs/electronic-public-health-reporting-among-non-federal-acute-care-hospitals-during

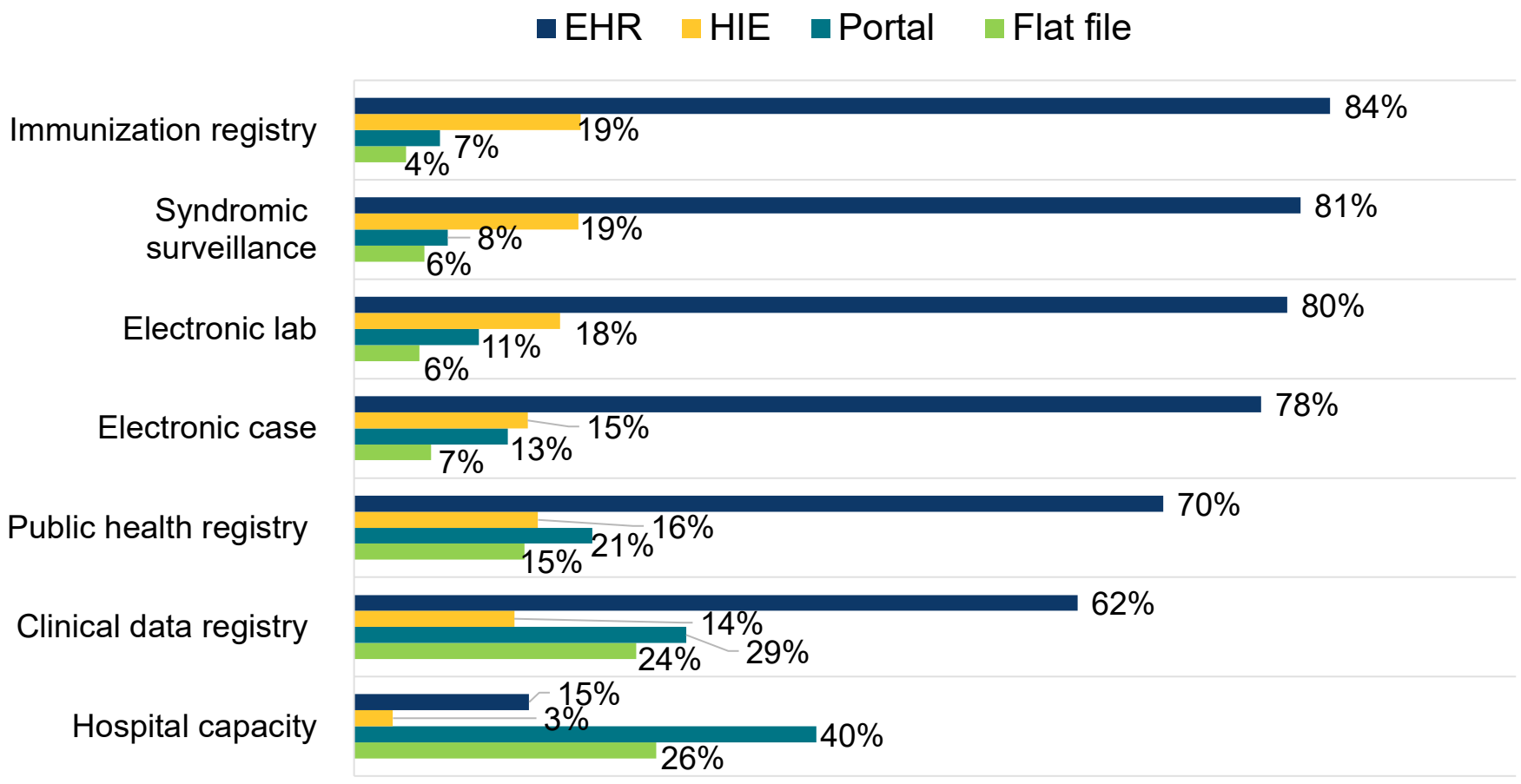
In 2022, fully or primarily automated processes were used to submit data for most types of public health reporting

Processes used to submit data for public health and hospital capacity reporting, 2022.



EHRs were the most common method used to submit data for all 6 types of public health reporting

Methods used to submit data for public health and hospital capacity reporting, 2022.



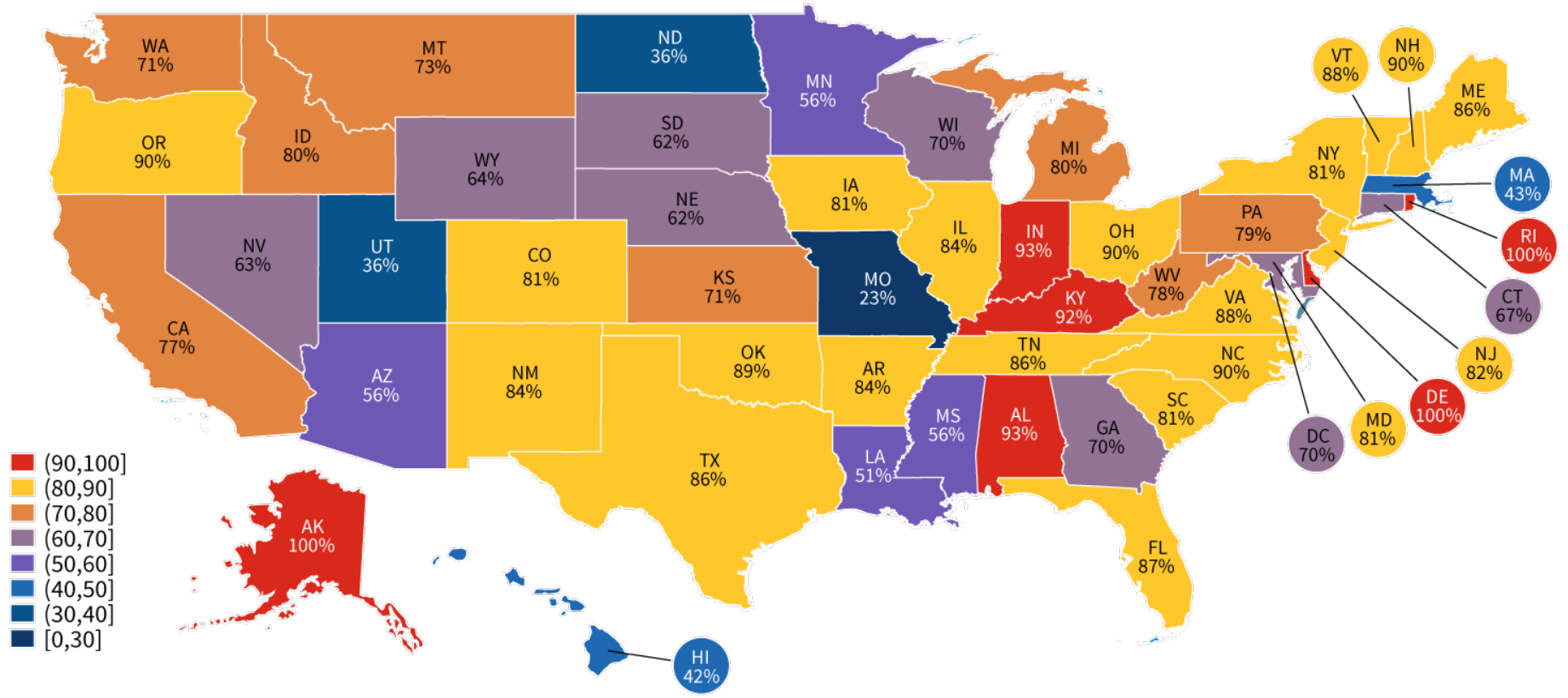
However, rates of portal & flat file use remain relatively high for public health registry, clinical data registry, and hospital capacity reporting

Percent of hospitals that reported experiencing a given challenge for at least one public health reporting type in 2022 and mean number of reporting types (among those experiencing the challenge for at least one reporting type).

	At least one reporting type
Hospitals feel PHAs lack the capacity to electronically receive information	50%
Technical complexity of interfaces, transmission, or submission process	39%
Onboarding process for electronic reporting is too cumbersome	38%
Cost related to interfaces, transmission, or submission	26%
Difficulty **extracting relevant information** from EHR	19%
Hospitals report they lack the capacity to electronically send information	16%
Use **different vocabulary standards** than PHAs, making it difficult to submit	16%
Data **not stored in a discrete format** within the EHR	13%

Overall, three-quarters of hospitals experienced at least one challenge to public health reporting but this varied by state, ranging from 23% to 100%

Percent of hospitals experiencing at least one public health reporting challenge in 2022, by state.



Discussion & Conclusions

Key Findings

In 2022, most hospitals were submitting data electronically using fully or primarily automated process for required public health reporting

- Electronic reporting was less likely among hospitals with fewer resources, for optional reporting types, and varied by state.

Yet, more than three-quarters of hospitals nationally reported experiencing at least one challenge to public health reporting in 2022.

- Top challenges relate to hospitals perceiving PHAs lack the capacity to electronically receive information, technical complexity and cost of interfaces, transmission, or submission process and difficulty of onboarding process

Implications for Policy & Practice

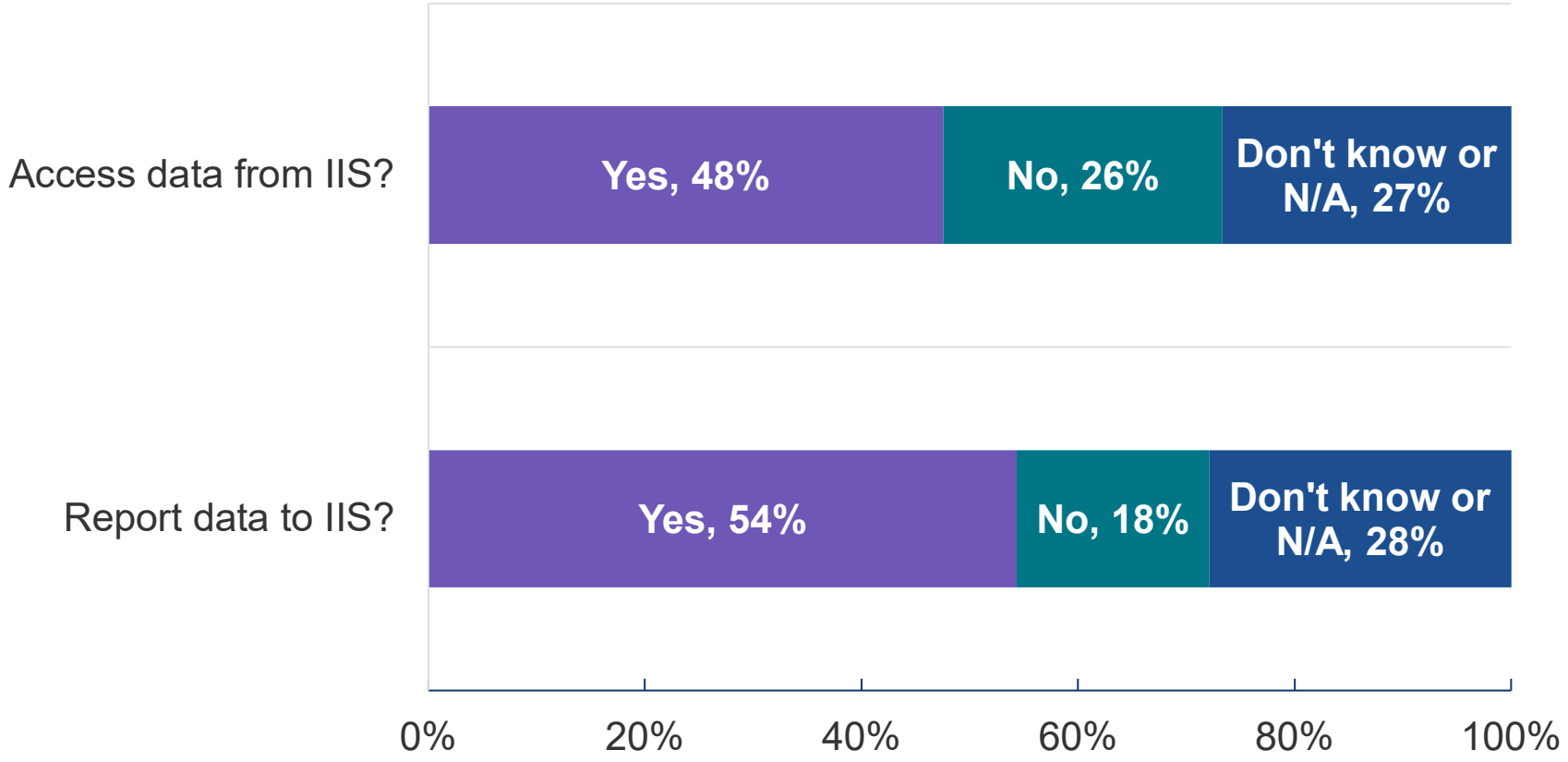
Early evidence suggests national efforts to incentivize electronic reporting and improve methods of exchange have been successful in improving rates of electronic reporting.

- Ongoing efforts to promote data standardization, such as through ONC's health IT certification program, can help mitigate certain reporting challenges and help support automated public health reporting.
- Persistent challenges underscore the need to improve public health data systems and remove barriers to entry for hospitals in the process of electronically submitting data for public health reporting.
- Continuous monitoring will be important for developing solutions to address these barriers and increasing rates of electronic, automated public health reporting.

Physician Reporting and Access to Immunization Data

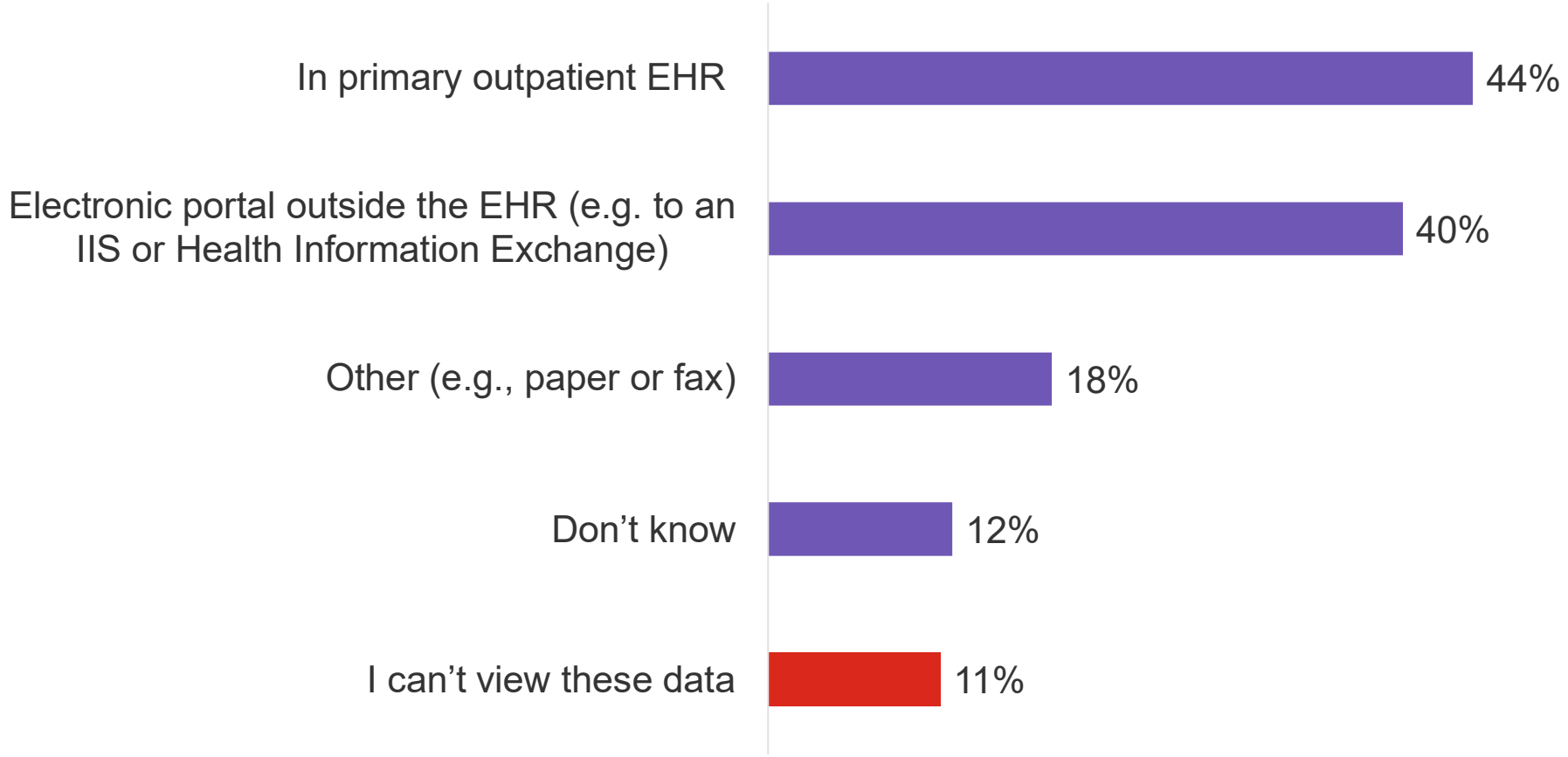
About half of family physicians indicated their EHR is capable of reporting data to and accessing data from their state's IIS — 43% reported both capabilities

Physician-reported capabilities of EHR system to electronically report data to and access data from their states Immunization Information System (IIS)



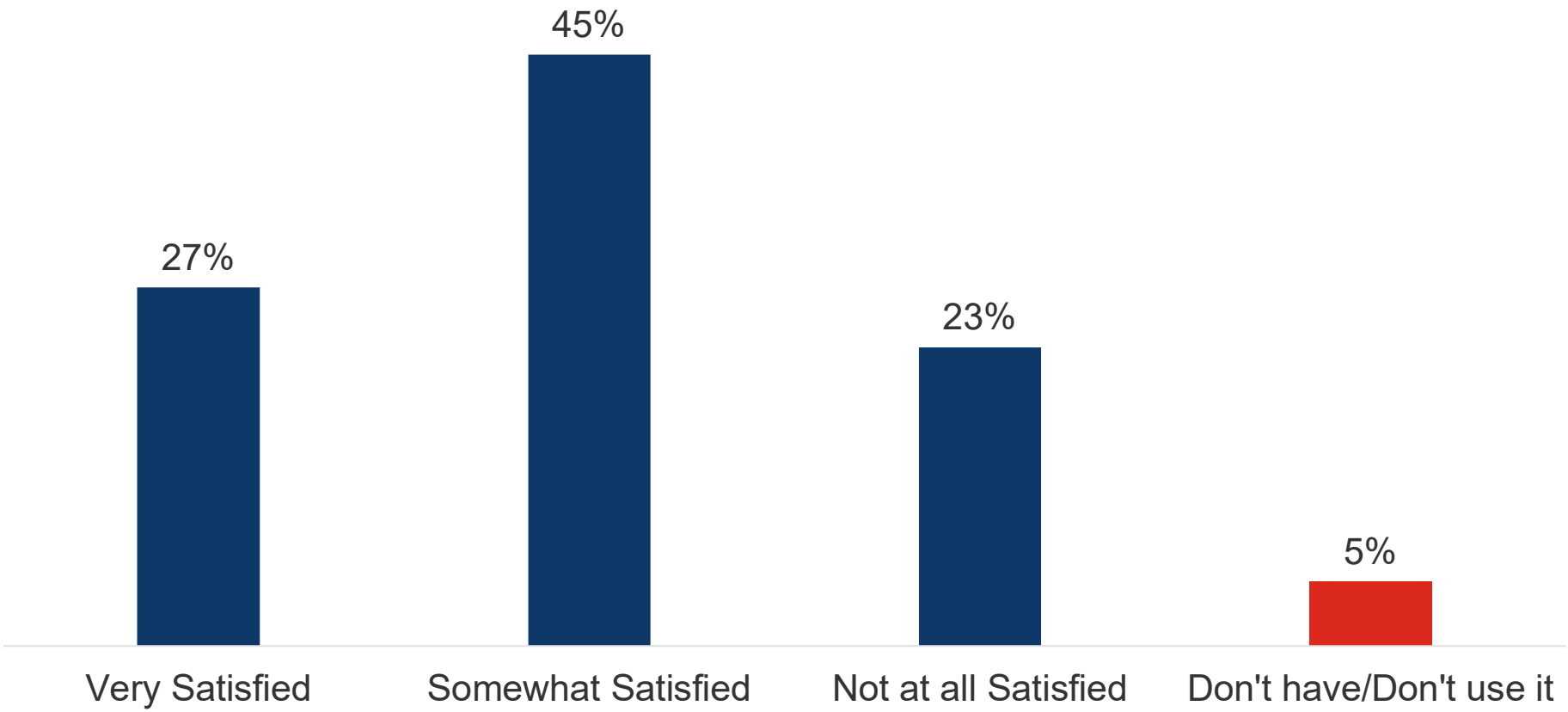
Most physicians viewed immunization data from outside their organization using an EHR or outside portal

Physician-reported methods of viewing immunization data from sources outside of their organization



In 2022, most family physicians were satisfied with their ability to electronically access external immunization information in their EHR and/or portal

Physician-reported satisfaction with their electronic access to external immunization information within their EHR and/or portal



Discussion & Conclusions

Key Findings

- **Physicians are behind hospitals with regards to their engagement in electronic immunization data exchange.**
- In 2022, about 4 in 10 family medicine physicians reported the ability to report, access, and view immunization data using their EHR
- Many physicians viewed immunization data from outside their organization using their EHR (44%) or outside portal (40%), but nearly 1 in 5 still use other methods such as paper or fax (18%).
- Almost three-quarters indicated they were satisfied with their ability to access this information electronically, but only about a quarter were “very” satisfied.

Implications for Policy & Practice

- As of 2022, immunization registry reporting is required of eligible clinicians participating in the CMS Promoting Interoperability performance category of the Merit-Based Payment System.
- With CDC’s Data Modernization Initiative efforts underway, improving interoperability of EHR and IIS systems could help improve physicians’ ability to report, access and view immunization information needed to support patient care and population health.

Current State of Public Health Exchange: The View from State & Territorial Health Agencies

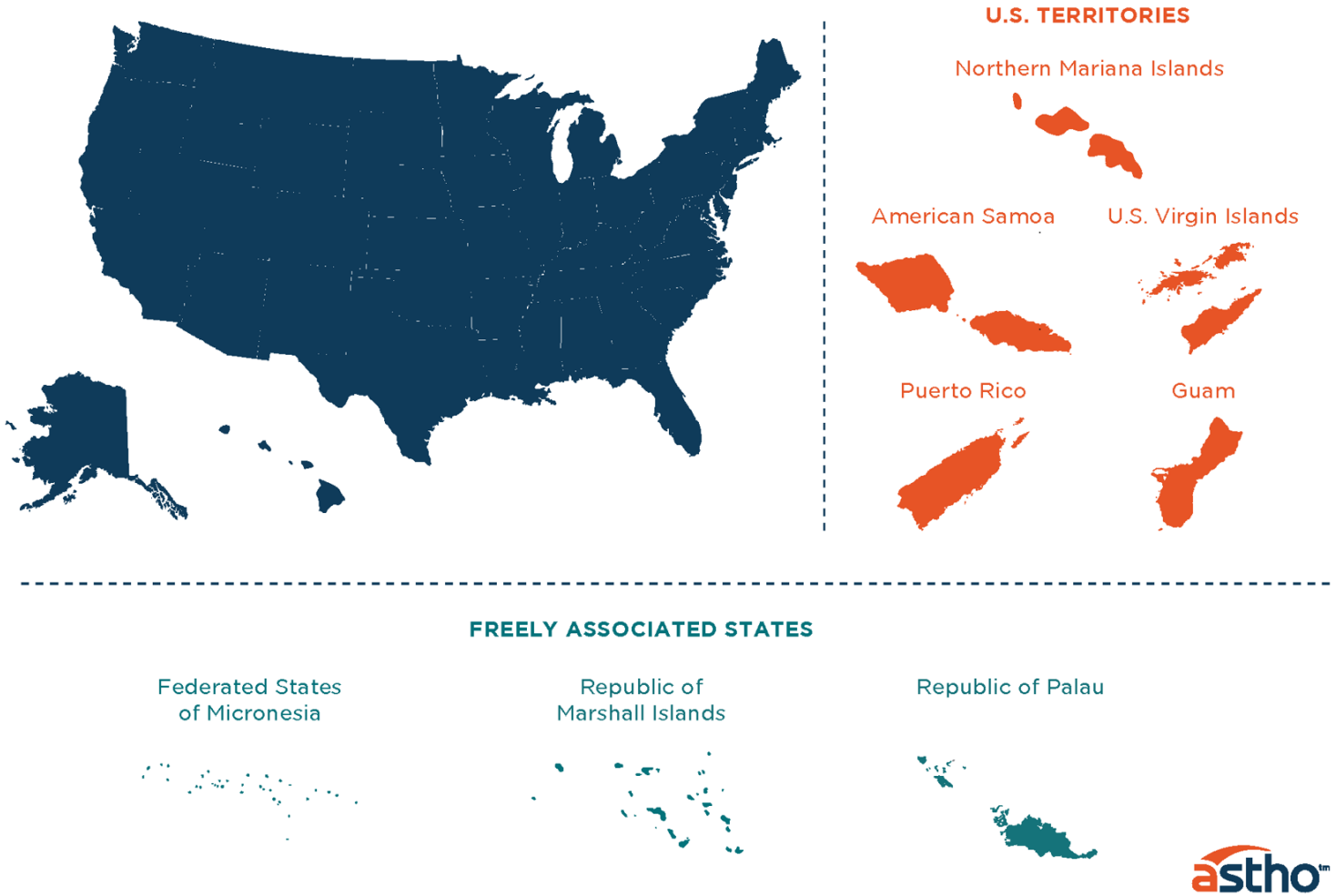
Elizabeth Ruebush, Senior Director,
Public Health Data Modernization & Informatics, ASTHO

Sept. 21, 2023

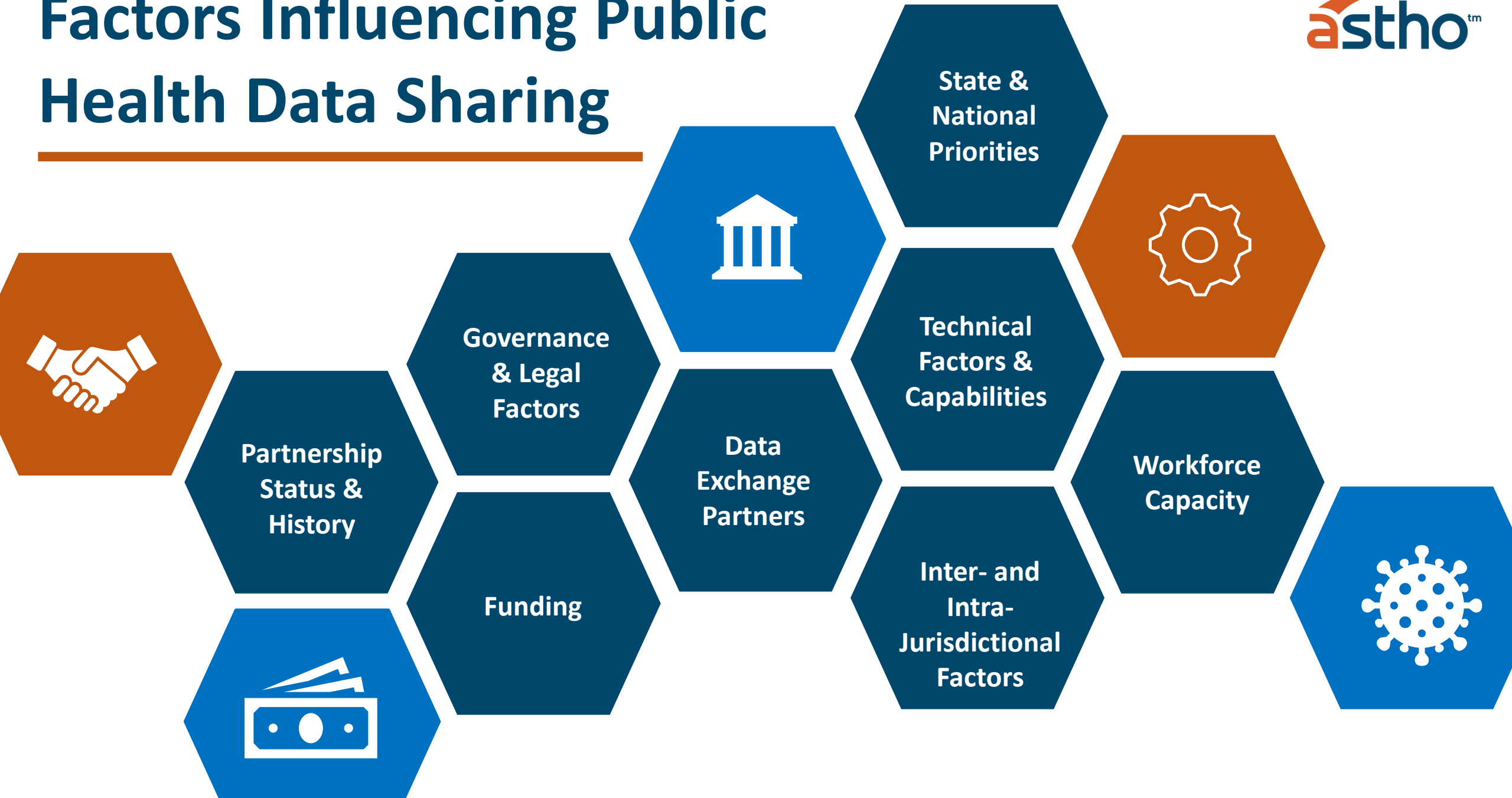
Who Do We Represent?

- **59 chief health officials (S/THO)** from each of the 50 states, DC, five U.S. territories, and three Freely Associated States.

- ASTHO also supports **peer communities of s/t health leaders and senior executives in health departments** who work with the over 100,000 public health professionals employed at state and territorial public health agencies.



Factors Influencing Public Health Data Sharing



ASTHO Profile of State & Territorial Health

The ASTHO Profile aims to define the scope of state and territorial public health services, identify variations in practice among state and territorial public health agencies, and contribute to the development of best practices in governmental public health.

- Launched in 2007 and fielded every 2-3 years.
- **Preliminary findings from the informatics section** of the 2022 ASTHO Profile survey feature information on:
  - Electronic data collection.
  - Prioritized areas of improvement in data modernization plans.
  - Decision-making authority for public health data exchange and information systems.
  - Location of informatics offices.
  - Public health informatics workforce.

The Profile of State and Territorial Public Health survey and dashboard was supported by funding from the Centers for Disease Control and Prevention cooperative agreement number NU38OT000290, and Strengthening U.S. Public Health Infrastructure, Workforce, and Data Systems Grant (NE11OE000066), as well as the Robert Wood Johnson Foundation. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention, the Department of Health and Human Services or the Foundation.

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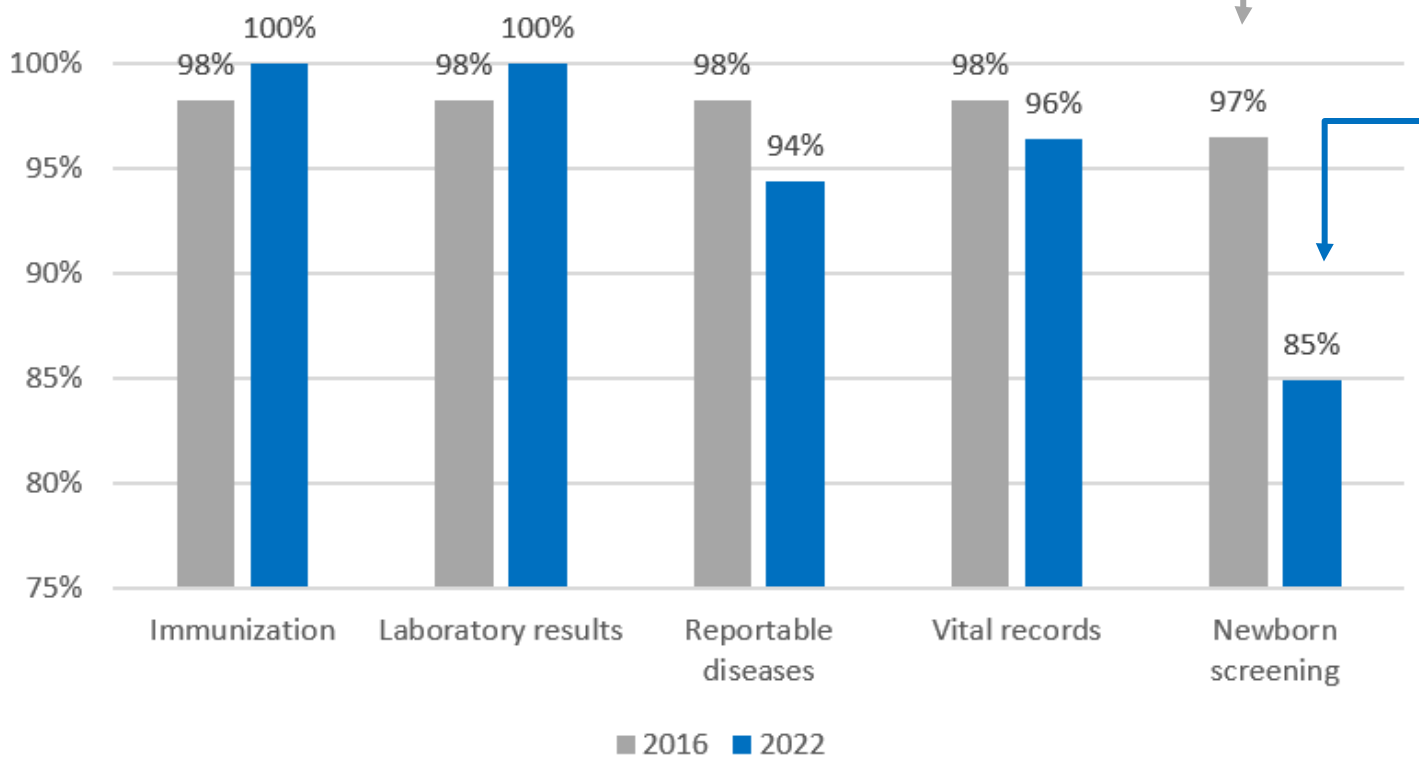
Electronic Data Collection in Health Agencies

In 2022, a majority of health agencies report primarily collecting data electronically across an array of program areas and functions.

Percent of public health jurisdictions indicating electronic data collection, by data type



2016: Collecting data electronically?

2022 question change: Collecting data **primarily** through electronic means?

Note: Sample size varies. Percentages excluded jurisdictions with missing and "I don't know" responses.

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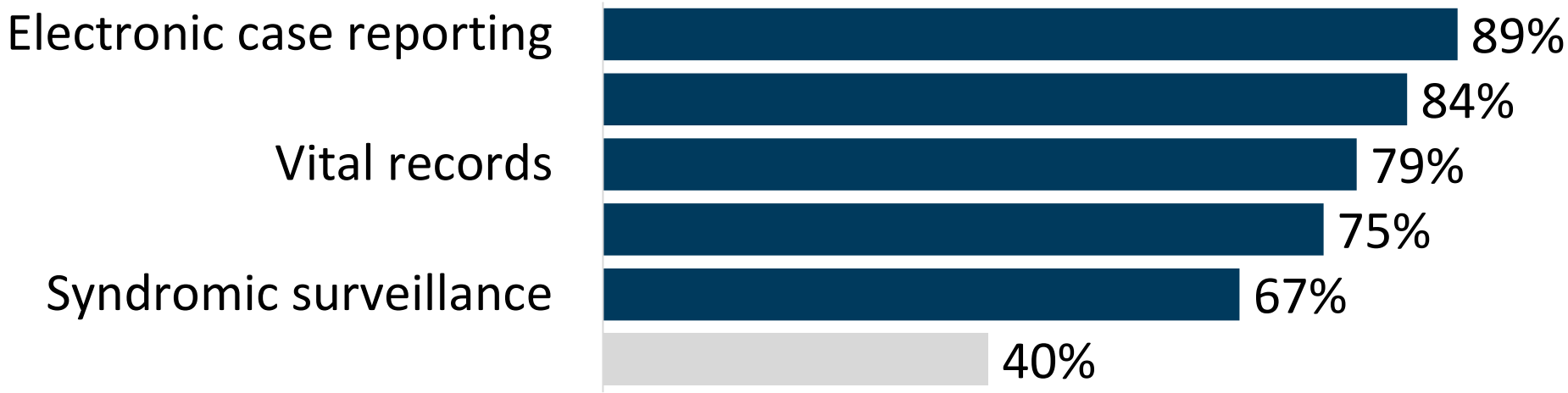
Areas of Improvement Targeted in Data Modernization Plans

The most common areas of improvement within data modernization plans were electronic case reporting, notifiable and reportable diseases, and vital records.

Percent of public health agency jurisdictions with a data modernization plan (established or in development) that included the targeted area of improvement (n=57).



Primary Responsibility for Data Exchange Decisions

Data exchange and public health information management system decision-making is shifting from a more centralized role to other roles/shared decision-making in many jurisdictions.

	Roles responsible for health agency decisions regarding policy and standards for data exchange	Roles responsible for decisions regarding public health information management systems
2016	• The **chief information officer** (or equivalent) held primary responsibility in **29%** of state health agencies.	• The **chief information officer** (or equivalent) had overall decision-making authority in **over half** (54%) of state health agencies.
2022	• A majority of state and territorial health agencies (**43%**) report that **other roles*** have primary responsibility. The **chief information officer** (or equivalent) is responsible for these decisions in **23%** of agencies. ***Types of roles mentioned:** State health officer, executive management team, privacy officer, decision-makers at the program/bureau level with legal advising, decision-making shared across multiple roles (e.g., secretary of health, chief information security officer, state epidemiologist, informatics director), etc.	• The **chief information officer** (or equivalent) has overall decision-making authority in **over a third** (39%) of state and territorial health agencies. **Other roles†** have overall decision-making authority in **a quarter** of state and territorial health agencies. **†Types of roles mentioned:** Health commissioner, chief information security officer, section manager for specific system, steering committee, decision-making shared across multiple roles, etc.

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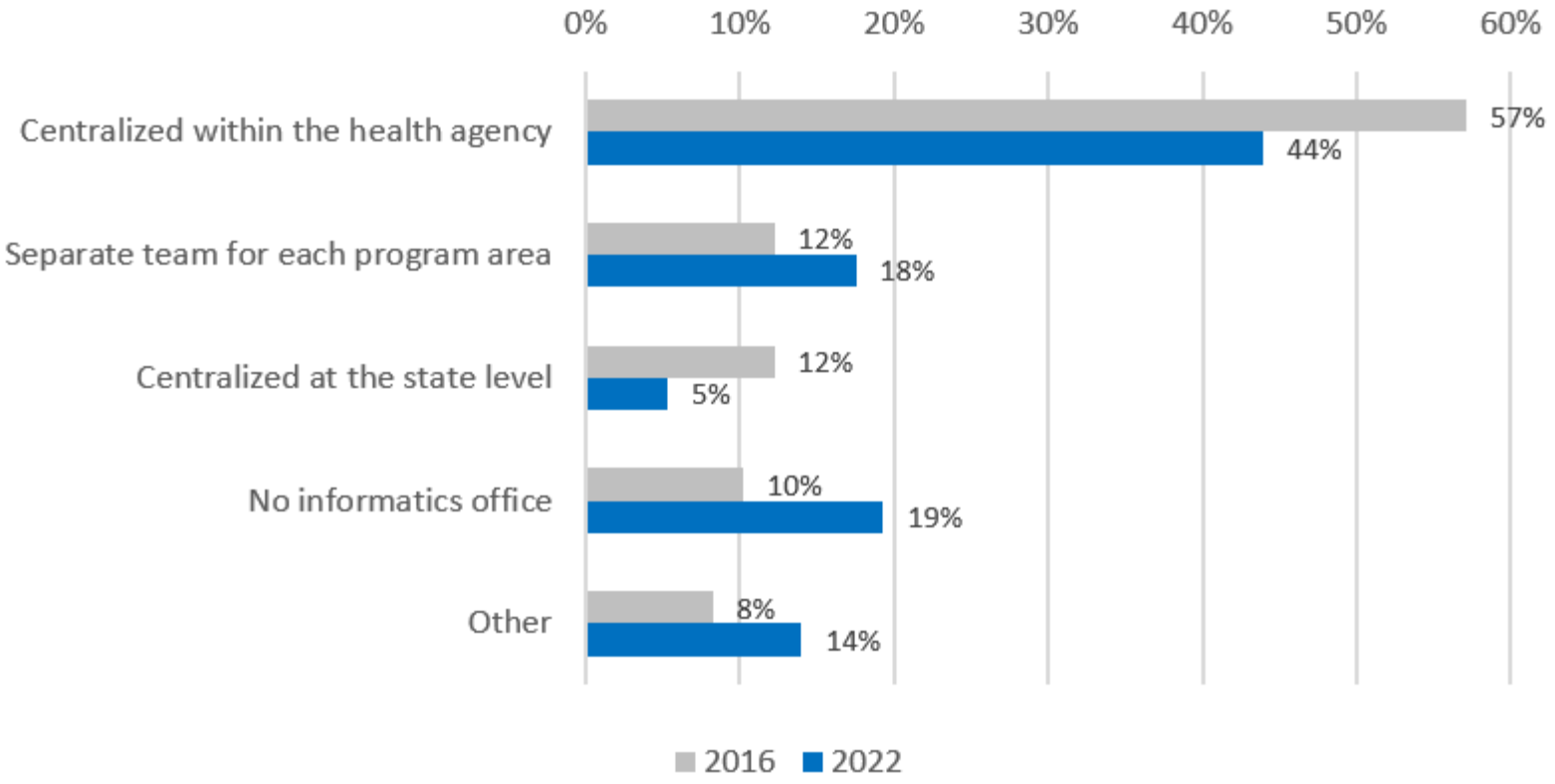
Location of Informatics Offices

In 2022, nearly half of jurisdictions (44%; 25/57) reported informatics offices that are **centralized within public health agency** as a separate team, program, or division.

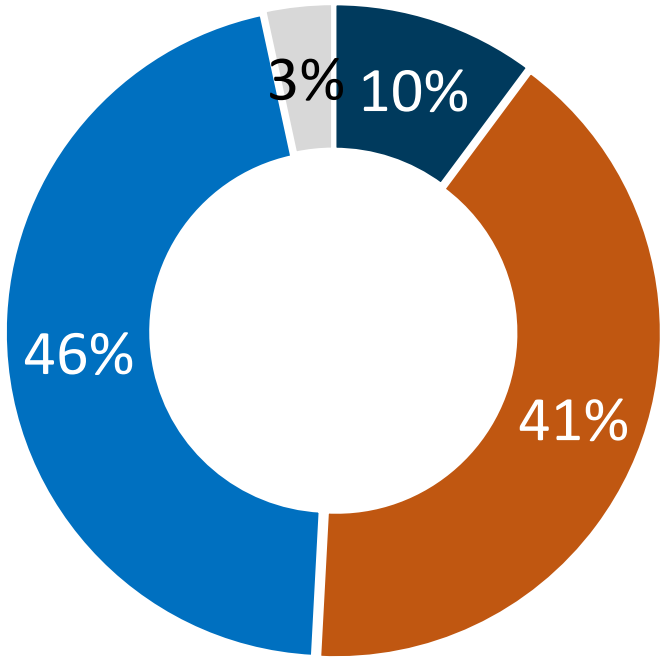


- Jurisdictions were roughly evenly split between those reporting that there is **not an informatics office** in the public health agency or in another state government agency (19%) and those reporting informatics offices within a public health agency but as a **separate team for each program area** (18%).

Note: Sample size varies.

Informatics Career Series

In 2022, about half of jurisdictions **have an informatics career series** or **were developing one**, the other half had **no plans to develop an informatics career series** or **did not respond**.



Percent of public health agency jurisdictions with an informatics career series (n=59).

- The number of jurisdictions with plans to implement a career series for informatics has nearly doubled since 2016.
- Agencies without an informatics career series are more likely to find informatics workforce recruitment and retainment very challenging.
- The most common informatics titles include Data Analyst, Statistician, and Epidemiologist.

Recruitment & Retention of Public Health Informatics Workforce

Informatics staff FTEs within public health agencies only account for about 1.1% of health agency staff in both 2016 and 2022.

The top challenges in attracting and retaining informatics talent include:

1. Salaries not competitive with the private sector
2. Lack of established informatics career series or pipeline
3. Lack of existing informatics position descriptions with specified skills, roles, and responsibilities

100%

of state health agencies* report that attracting and retaining informatics talent is somewhat or very challenging

*N=48

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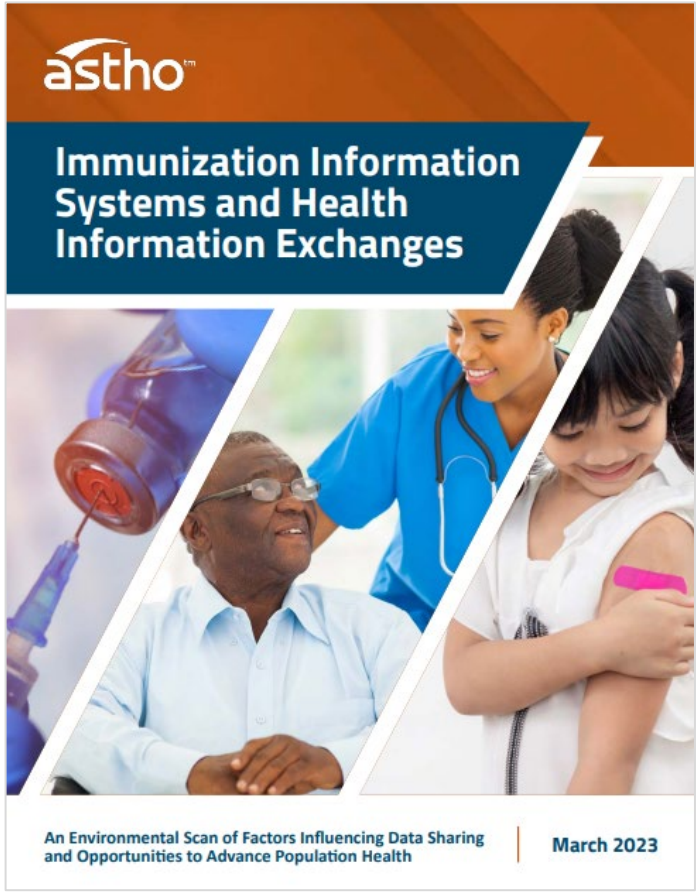
Exploring the Dynamics Influencing Public Health Data Sharing



- Scans conducted as part of ASTHO's ONC-funded COVID-19 Immunization Data Exchange, Advancement, and Sharing (IDEAS) Program

bit.ly/3nt7Q9P

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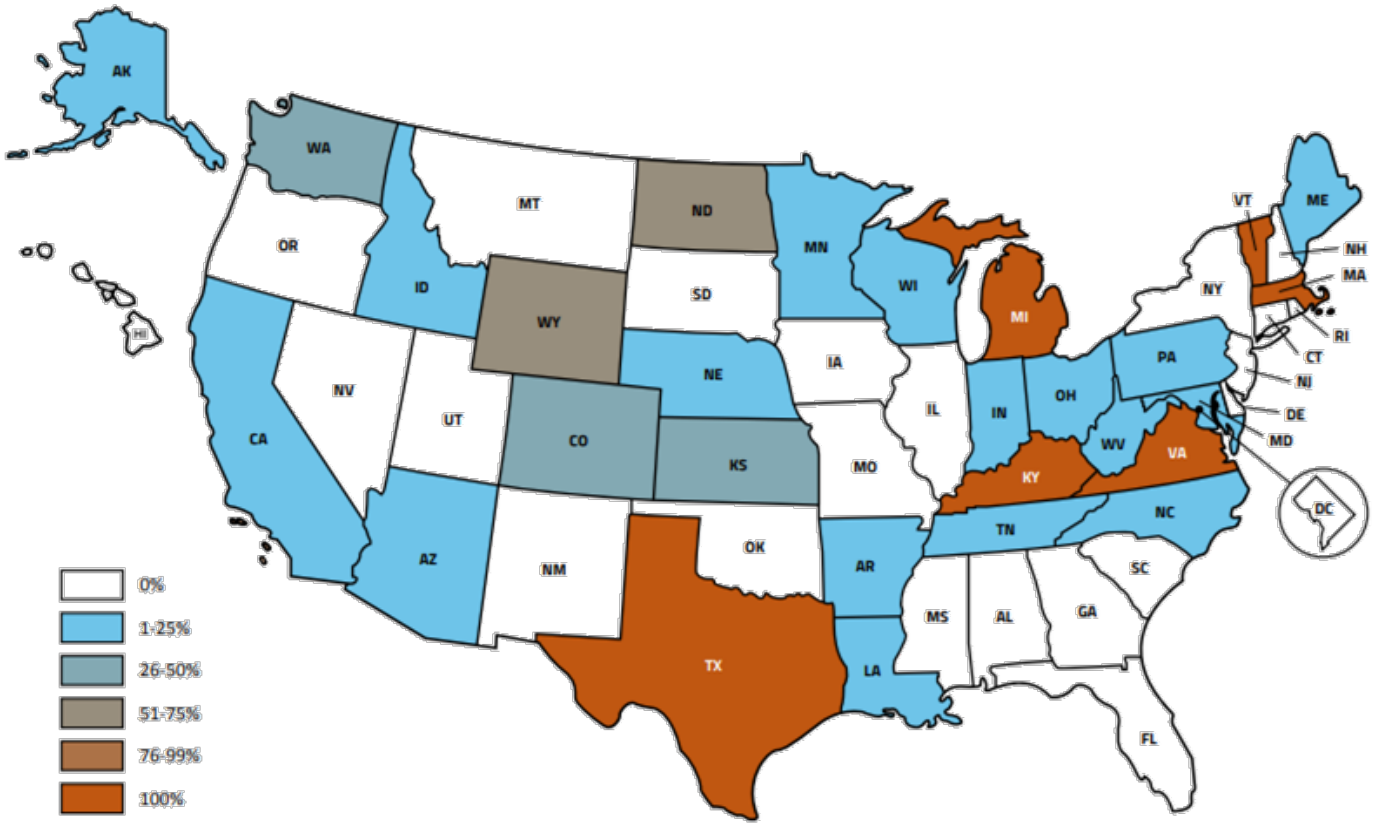
IIS and HIE Connectivity

Percent of Provider Site Connections to IISs Mediated by an HIE, by Jurisdiction, 2020

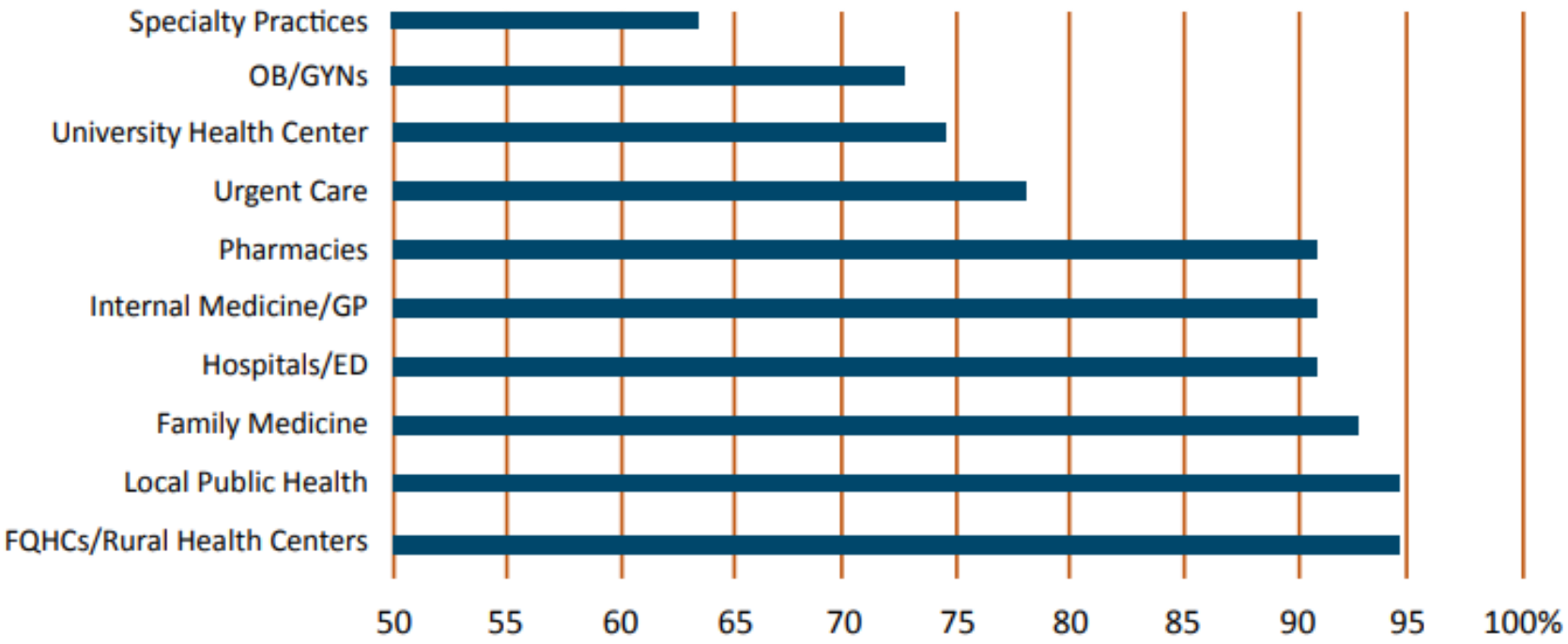


Source: Map created with data from CDC's 2020 IIS Annual Report

A wide range of public health and HIE connectivity for immunization data sharing across the nation, with just **over half** of jurisdictions indicating some level of HIE-mediated connections

Provider Types Reporting to the IIS

Percent of IISs Indicating Data Submission by Adult Vaccination Provider Type or Setting, 2020

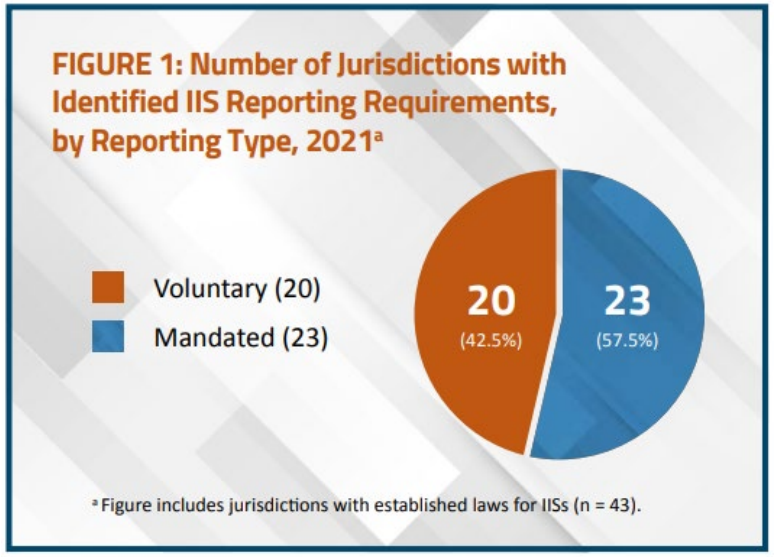


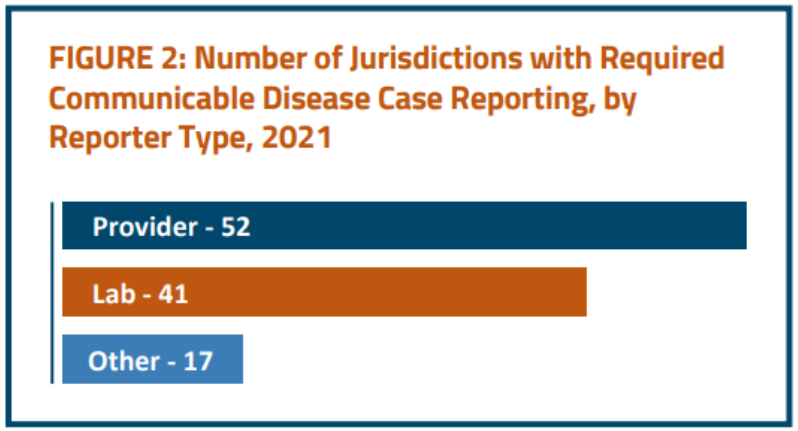
IISs most consistently indicated receiving adult vaccination administration reports from:

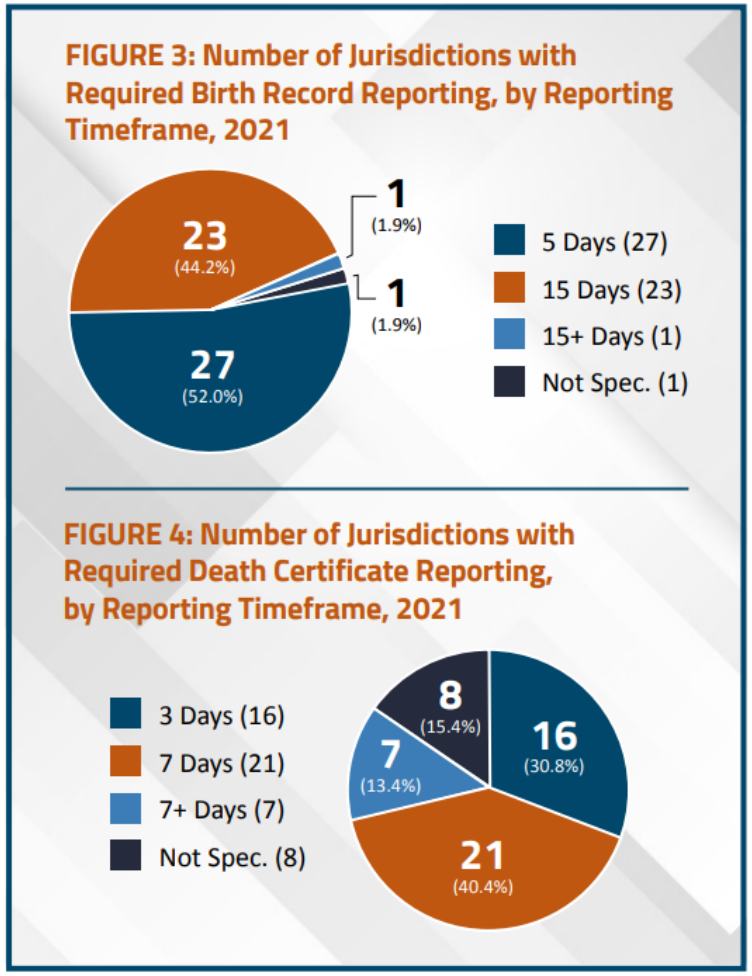
- FQHCs/rural health centers
- Local public health
- Family medicine providers

Source: Chart created with data from the American Immunization Registry Association (AIRA), "Survey of the IIS Community on Adult Capture." (2020).

Legal Factors Influencing Data Sharing







- Public health data collection and sharing are governed by a complex variety of laws. Not all jurisdictions are able to share data uniformly, which may impact broader data exchange efforts.

Key Takeaways

- A majority of health agencies report **primarily collecting data electronically** for reportable diseases, immunizations, laboratory results, vital records, and newborn screening.
- The most **common areas of improvement** targeted within health agency data modernization plans are electronic case reporting, notifiable and reportable diseases, and vital records.
- **Roles responsible for health agency decisions regarding data exchange and information management systems are changing over time**, in some cases shifting from a more centralized role (e.g., chief information officer) to other roles or multiple entities/roles involved decision-making.
- **Nearly half of jurisdictions reported informatics offices that are centralized** within public health agency as a separate team, program, or division, though this number of jurisdictions with this structure has decreased over time.
- About half of jurisdictions have an **informatics career series** or were developing one.
- National efforts to expand data exchange must consider the landscape of **state and territorial laws** governing public health data, as not all jurisdictions are able to share data uniformly.

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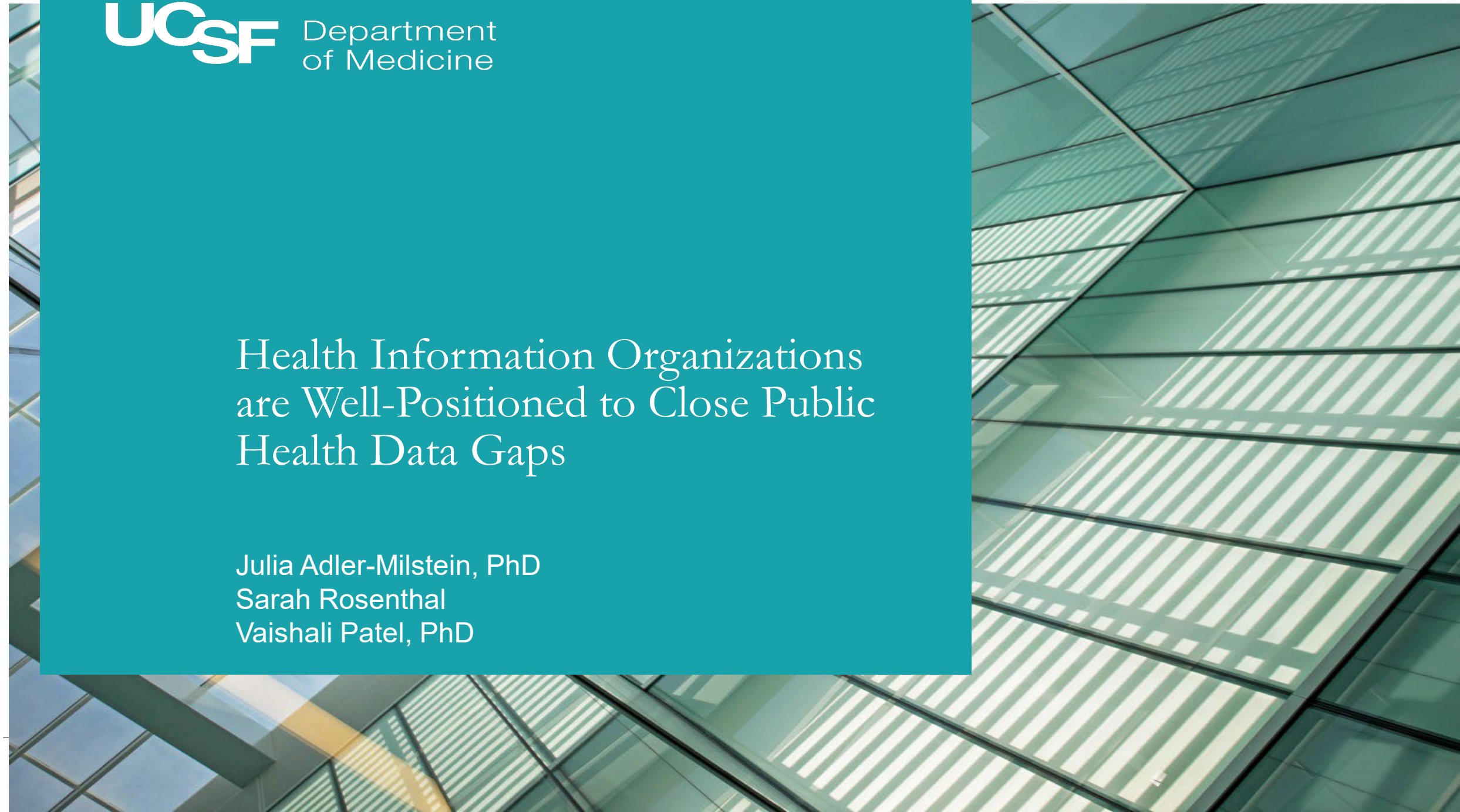
Thank you!

Elizabeth Ruebush (eruebush@astho.org)

UCSF Department of Medicine

Health Information Organizations are Well-Positioned to Close Public Health Data Gaps

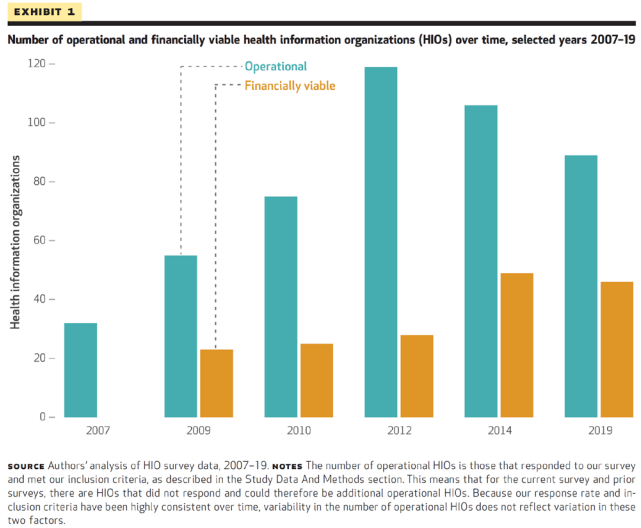
Julia Adler-Milstein, PhD
Sarah Rosenthal
Vaishali Patel, PhD



Background

- In response to the pandemic, efforts are underway to modernize public health data systems and resources.

- One potential strategy involves leveraging existing health information exchange infrastructure.
  - HIEs have rapidly expanded over the past decade to better facilitate health information sharing across organizational boundaries.
  - HIEs have large repositories of public health relevant data that can be potentially used to address gaps in health equity related information.



- No current data on HIEs capabilities to support public health reporting and specifically related to the COVID-19 pandemic

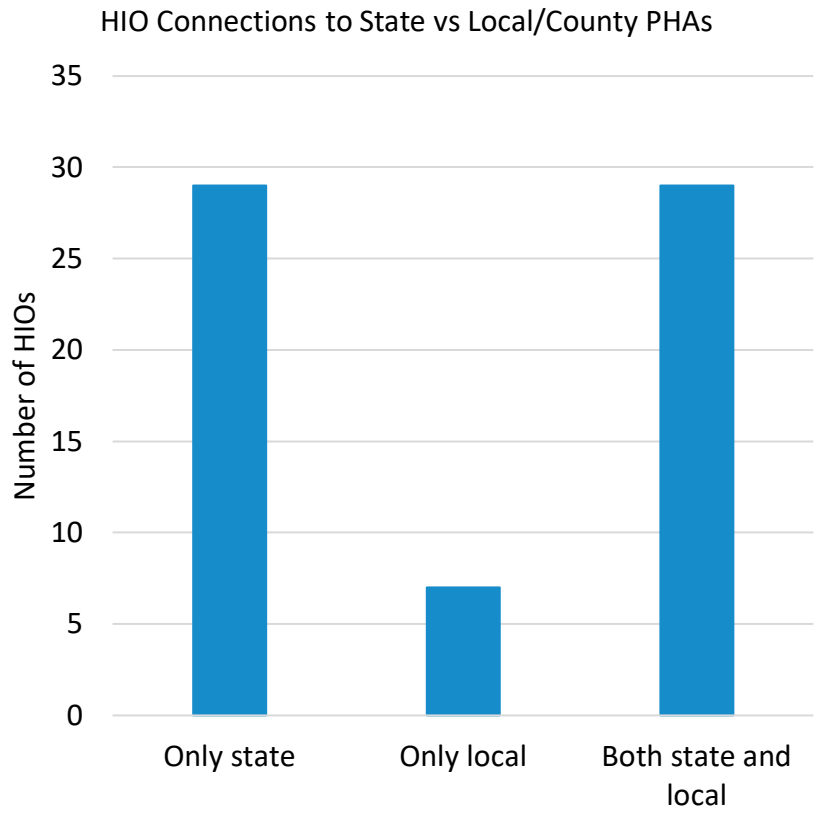
Overview of HIO Survey

- Online survey of HIO leaders representing:
  - Members of Civitas Networks for Health
  - Organizations identified from HIMSS as HIOs
  - State-designated/governmental HIOs
  - HIO contacts from previous rounds of survey
- Screening questions used to verify eligibility for the survey – limited to operational HIOs
  - Started with 135 organizations → 45 ineligible (not an HIO, not operational, merged)
  - Of the 90 eligible, 76 responded (84% response rate)
- Survey had a new module on public health capabilities – general and COVID-specific
- Data collection completed August 2023
- Findings presented are preliminary, descriptive analyses, which focus on public health related results

Key Findings: Public Health Reporting Capabilities & Barriers

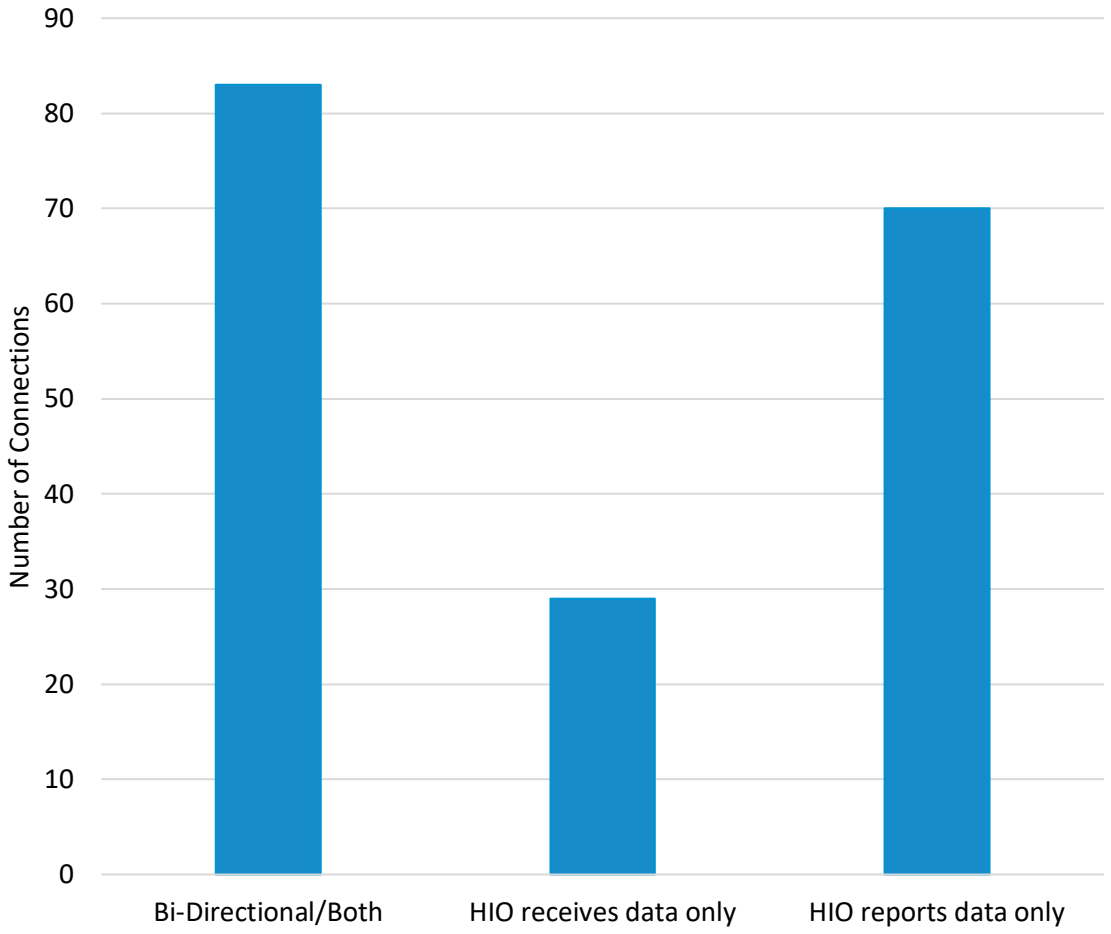
Overview of HIE-PHA Connectivity

- Of the 76 HIOs who responded, **65 HIOs** (86%) **provide data to one or more public health agencies (PHAs).**
  - Collectively, these 65 HIOs operate in **45 states** plus the District of Columbia.
- On average, these HIOs **connected to three different PHAs**
  - resulting in 192 total HIO-PHA connections

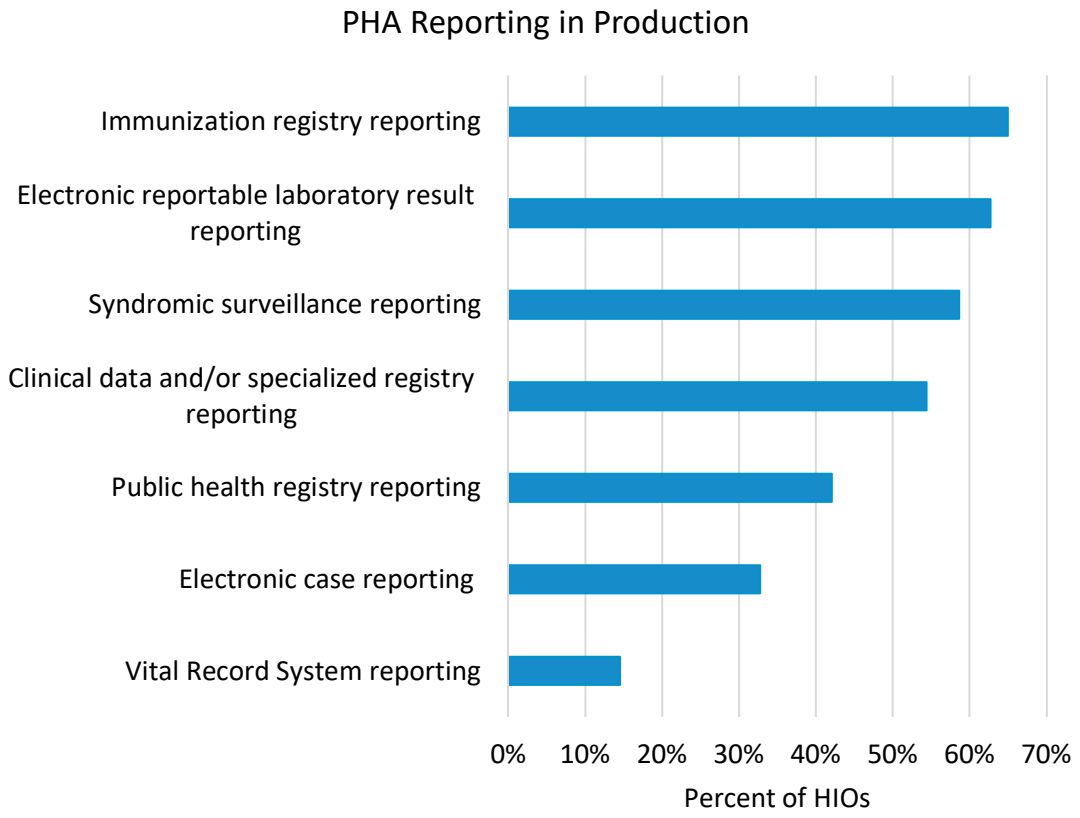


Approach to HIO-PHA Engagement

Of the 192 total connections between HIOs and PHAs, **46% had bi-directional exchange** (i.e., both the HIO and PHA provided and received data).

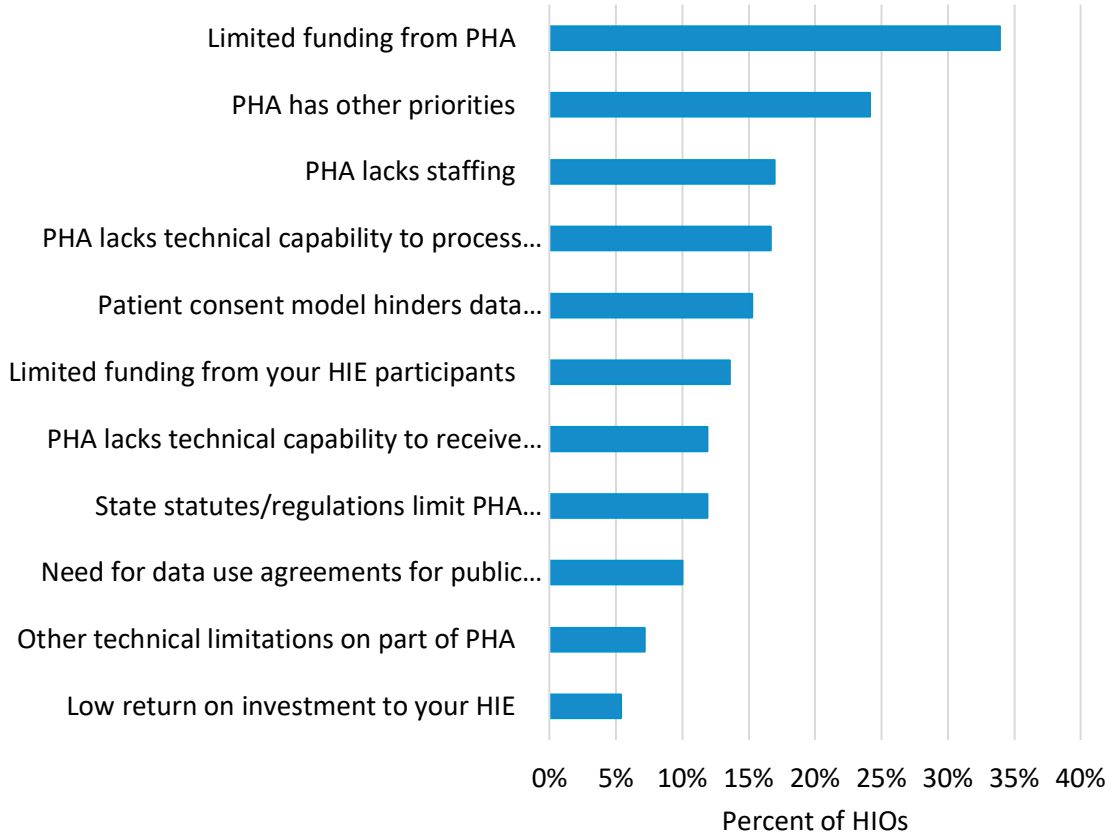


Public Health Data Reporting



Reporting data to immunization registries was the most prevalent type of PH reporting supported by HIOs (65% of HIOs) followed by lab reporting (63%) and syndromic surveillance reporting (59%).

Barriers to Public Health Reporting



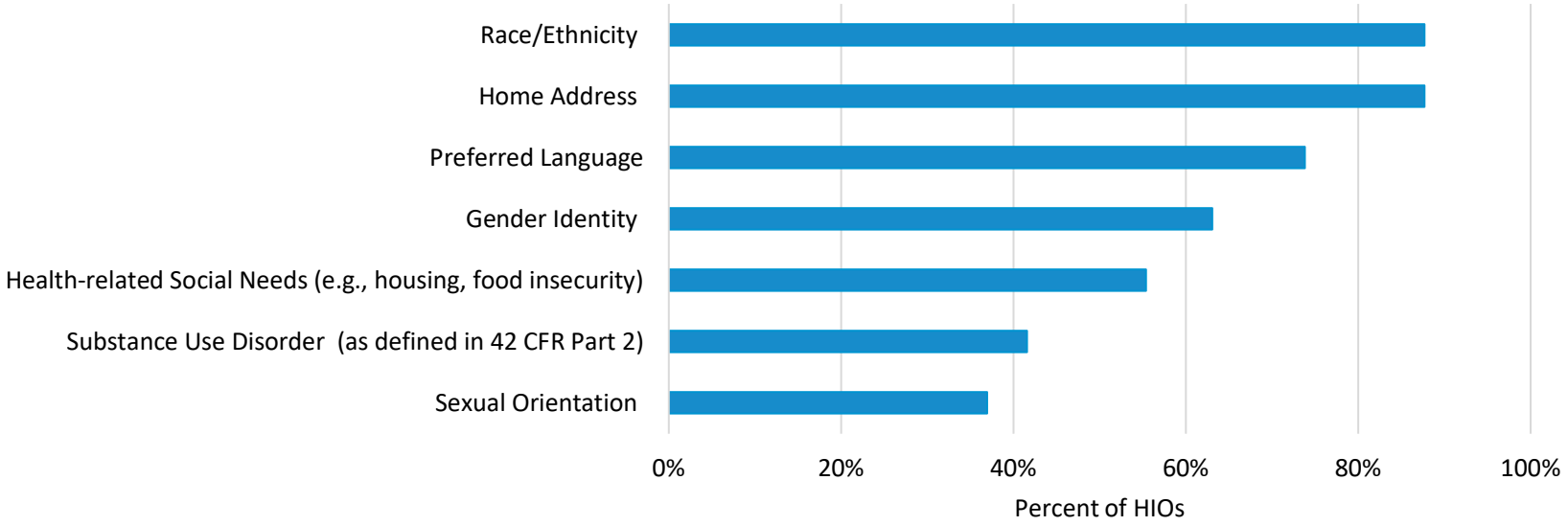
The **top "major" barriers** impeding HIO-PHA connectivity included PHA's **limited funding** (cited by 34% of HIOs), PHA's **focus on other priorities** (24%), PHA's **lack of staffing**(17%), and **limited technical capabilities** (17%).

Key Findings: COVID-19 Specific Capabilities

Public Health Data Completeness

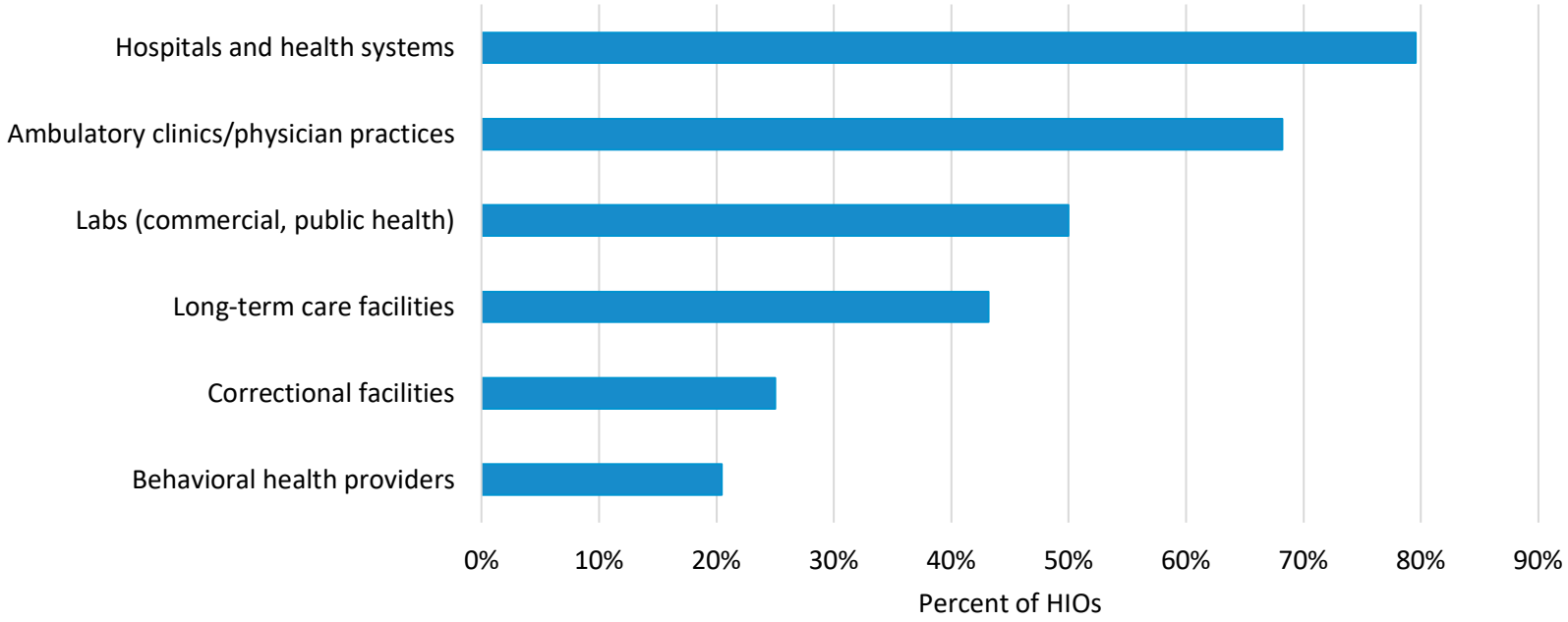
- **61% of HIOs provide data to fill gaps in COVID-19 related data** while an additional 31% could do so.

- The majority of HIOs with PHA connectivity capture data that can be used to **help monitor health equity**, including home address (88%), race/ethnicity (88%), preferred language (74%), gender identity (63%), and health-related social needs (55%).



Expanded Participation since February 2020

Since the pandemic, **69% of HIOs connected to PHAs expanded provider participation**, particularly among hospitals and health systems (80%) and ambulatory care practices (68%).



Conclusions

- These novel survey results reveal that **HIOs are well positioned to support public health infrastructure modernization efforts**, particularly related to public health reporting and health equity.
  - HIOs are **unique in their abilities to link and share robust health-related data** with PHAs to enhance surveillance and monitoring for vulnerable populations.
  - **CDC's data modernization** efforts to improve public health data systems, and **ONC's public health informatics and technology workforce training program**, address key barriers to HIO-PHA connectivity and therefore should **help enable PHAs to better take advantage of HIO capabilities**.


UCSF
University of California
San Francisco

Q&A: Current State of Public Health Exchange National View

Perspectives on Public Health Reporting

	Public Health	Providers	HIOs
Current State	In 2022, a majority of health agencies report primarily collecting data electronically for reportable diseases, immunizations, laboratory results, vital records, and newborn screening. In 2020, half of jurisdictions reported have some HIE-mediated connections to support immunization data exchange.	In 2022, about half of family medicine physicians reported the ability to report, access, or view immunization data using their EHR. In 2022, hospitals largely submitted data electronically (using fully or primarily automated processes) for required reporting types. Electronic reporting was less likely among hospitals with fewer resources, for optional reporting types, and varied by state.	In 2022, 86% of operational HIOs were connected to one or more PHAs in 45 states. 46% of connections were bidirectional. Immunization reporting and lab reporting were the most common forms of exchange.
Facilitators	Almost half have an informatics career series or were developing one. Development of modernization plans relatively high but do vary by type of public health reporting activity.	Use of electronic methods to enable electronic reporting (EHRs, HIEs) was common for required reporting among hospitals, and hospital technical capabilities were not identified as key barriers.	HIEs possess capability to potentially: Improve PHAs data completeness (particularly around data that supports health equity monitoring) Support public health agencies' ability to receive data from multiple providers (esp. hospitals/health systems and clinics) via a single connection
Barriers	Decentralization in decision making and authority related to data exchange and IT systems, and location of informatics offices within public health agencies Difficulty attracting and retaining informatics talent Variation in laws governing reporting across jurisdictions	Hospitals perceiving PHAs lack the capacity to electronically receive information Technical complexity and cost of interfaces, transmission, or submission process Difficult onboarding process Physicians further behind with technical capabilities compared to hospitals for immunization reporting	Limited PHA funding (as reported by HIEs) Lack of PHA staffing and technical expertise PHAs have other priorities

Deeper Insights into Public Health Exchange and the Role of Networks

Michelle Meigs (APHL), Julia Adler-Milstein (USCF), Brian Fowler (ODH) and Dan Paoletti

The Evolution of AIMS as a Public Health data exchange intermediary

ONC Tech Forum: Modernizing Public Health Data Exchange: Lessons Learned and Tools for the Road Ahead
September 21, 2023

Michelle Meigs, MBA Director, APHL Informatics Program

The Association of Public Health Labs (APHL)

Vision

A healthier world through quality laboratory systems.

Mission

Shape national and global health **outcomes by promoting** the value and contribution of **public health laboratories** and continuously **improving** the public health laboratory **system and practice**.

A 501(c)(3) non-profit organization

Has over 1,500 members from state and local public health laboratories, state environmental and agricultural laboratories and others including federal agencies and academic institutions.

Advocates at the national level for critical laboratory issues and for increased support/resources for member labs.

Provides training and best practices for public health laboratory policy and programs.

APHL Informatics Program

Goals

Improve PHL technical capacity and capabilities

Better faster electronic data exchange

Increase technical efficiency of the public health system

Share knowledge and expertise through TA

Strengthen surge & emergency response

Support a more integrated public health system

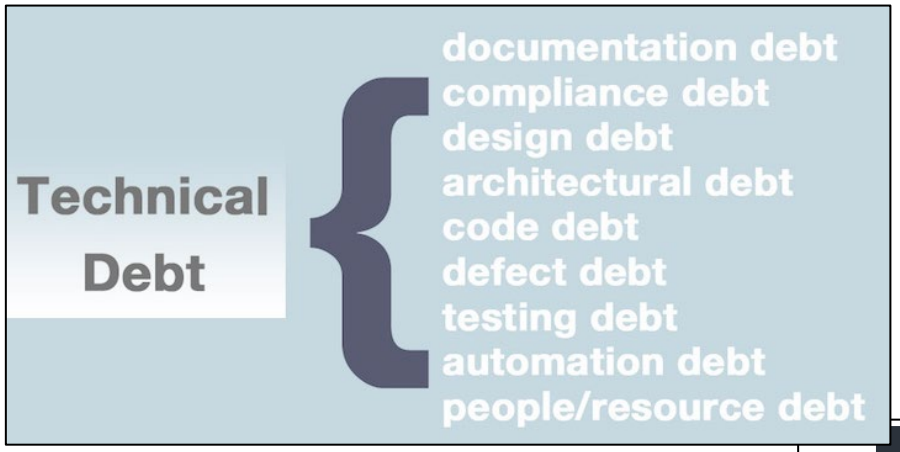
Ensure equitable, open access to AIMS and TA CoAg services

Quick Facts

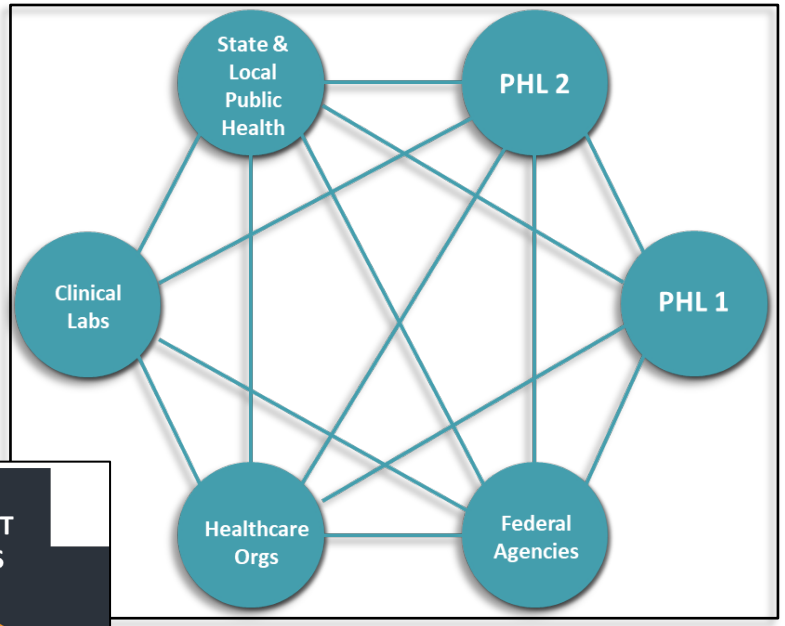
- 22 APHL Staff Members across three principal areas, we anticipate at least another 6 staff by end of CY.
  - *Operations, program management/member services and technical services (AIMS)*
- Ove 220 contracted subject matter experts
- Over 20 distinct projects each with several branching budget paths
- Cross programmatic collaborations with ID, Global Health, NBS and many others
- Committee Priorities:
  - Advancing Electronic Test Order and Result
  - Advancing the Data Modernization Initiative
  - Workforce Development

The Public Health Reality

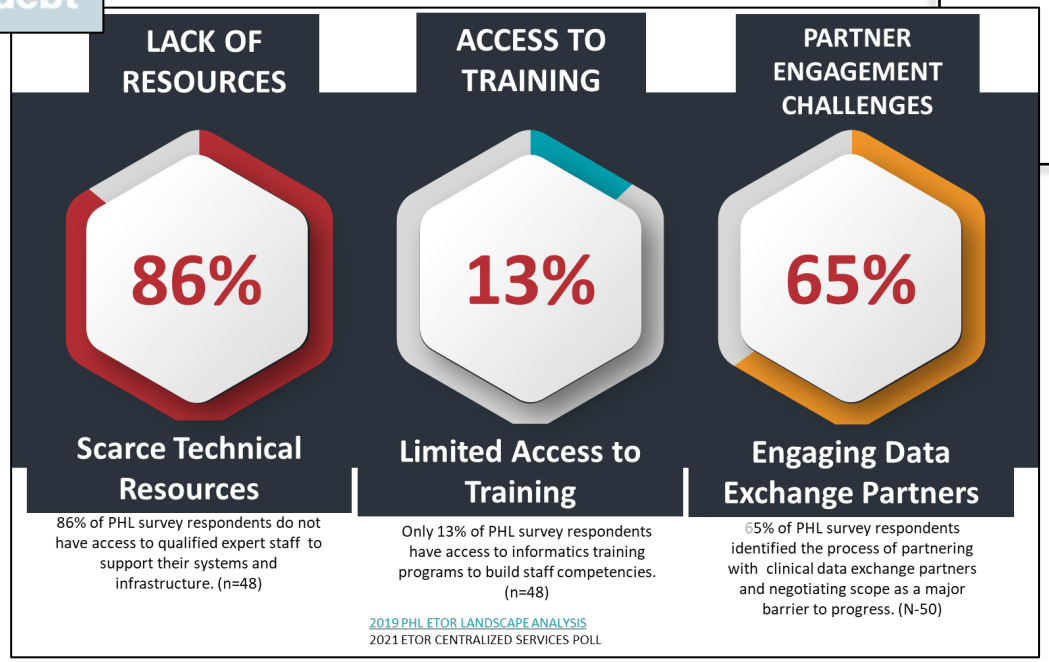
Accumulated technical debt



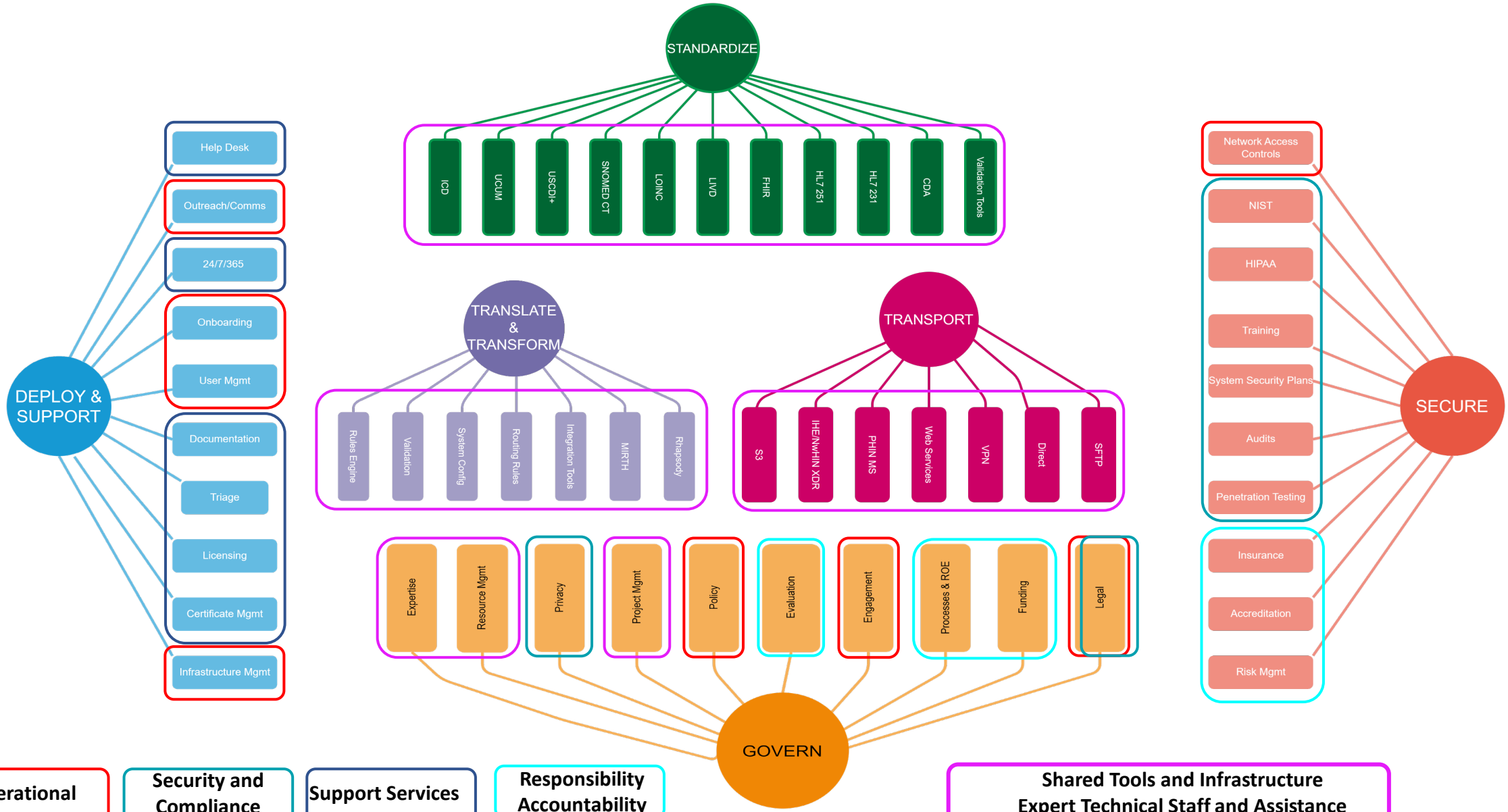
Competing data needs and priorities



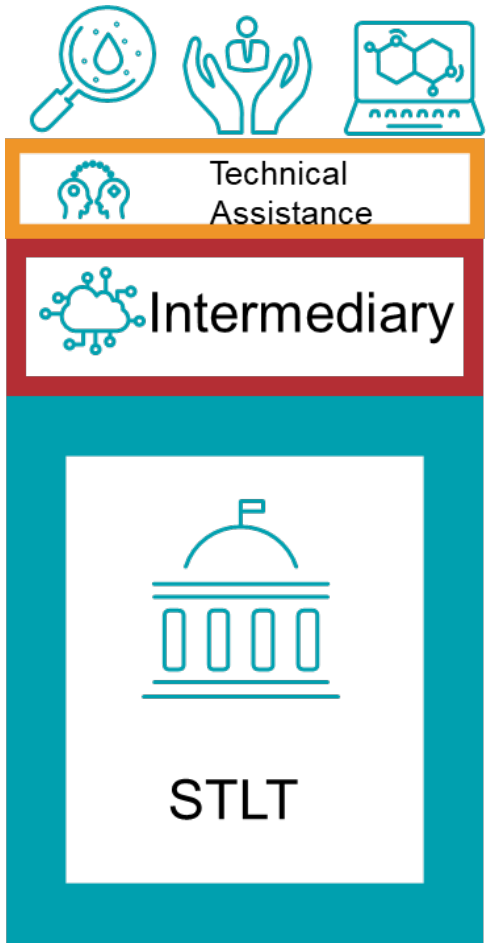
Limited access to technical expertise

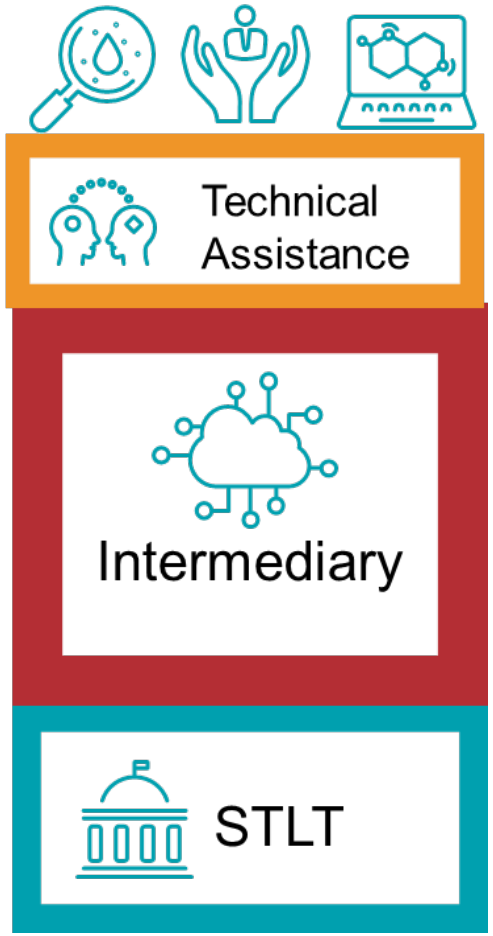


PH Intermediaries provide important efficiencies to reduce burden and effort on public health data exchange partners.

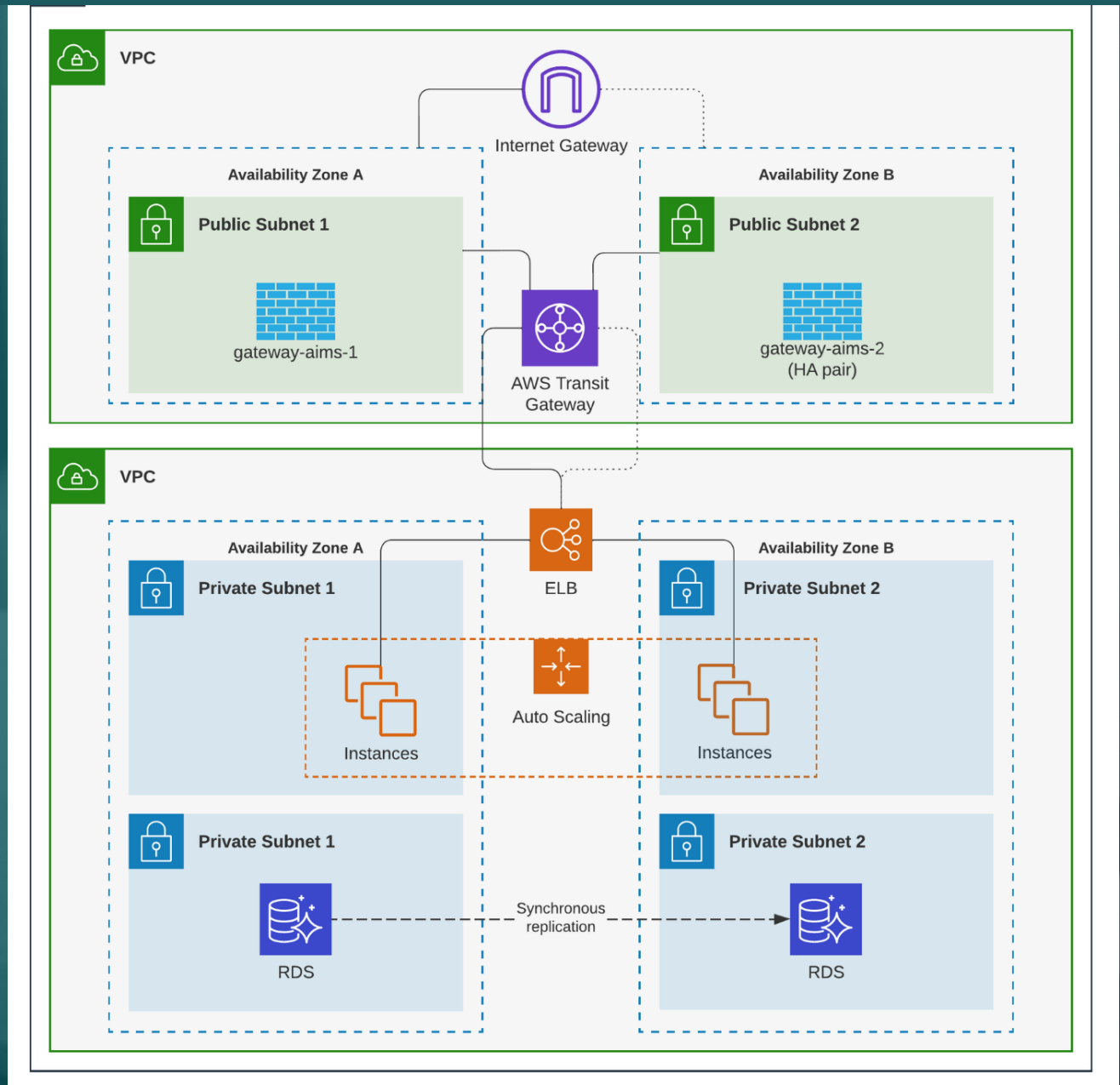


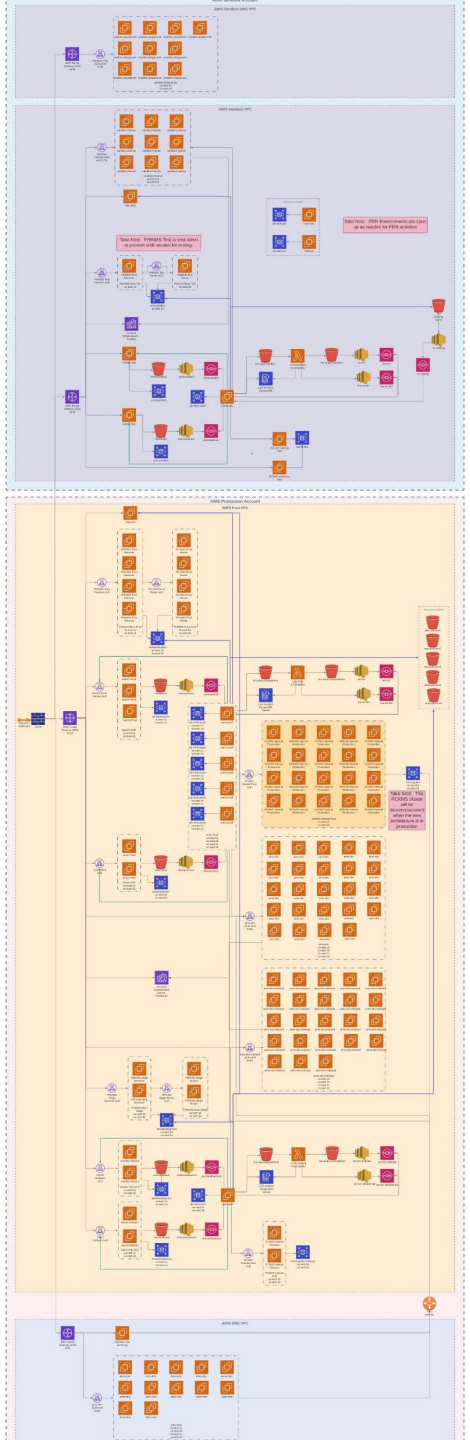
By providing STLTs access to otherwise unavailable infrastructure and expertise, intermediaries can also play an important role in health equity and health outcomes





AIMS Platform – A Public Health Data Exchange Intermediary





AIMS platform

2008

- **First PHLIP Flu Lab Surveillance Message transmitted to CDC** via Route not Read (RnR) hub
- Physical Servers still at data centers

2010

- Technical Assistance (TA) Program Launched

2013

- Completed 1st FISMA Audit

2014

- **Moved to Amazon Web Services (AWS)**

2016/2017

- **Securely transmitted 1 millionth message**
- Completed 2nd FISMA Audit
- First Quest ELR message arrives in Kansas via AIMS

2018

- First ELIMS messages transmitted from CDC to Texas
- Houston Methodist in production for eCR

2019

- Completed 3rd FISMA Audit
- R&D Innovation Projects
- Project w/ Chile, South America for Flu
- Launch of Project Management Office (PMO)
- **InterPartner - "Intelligent Message Processing"**

2020/2021

- COVID-19 Data Exchange & Management Activities
- **eCR kicks into gear! From pilot to FULL PRODUCTION**
- EHNAC DT P&S / HISP Accreditation
- Declared Public Health Authority by CDC
- DirectTrust Accreditation

2022

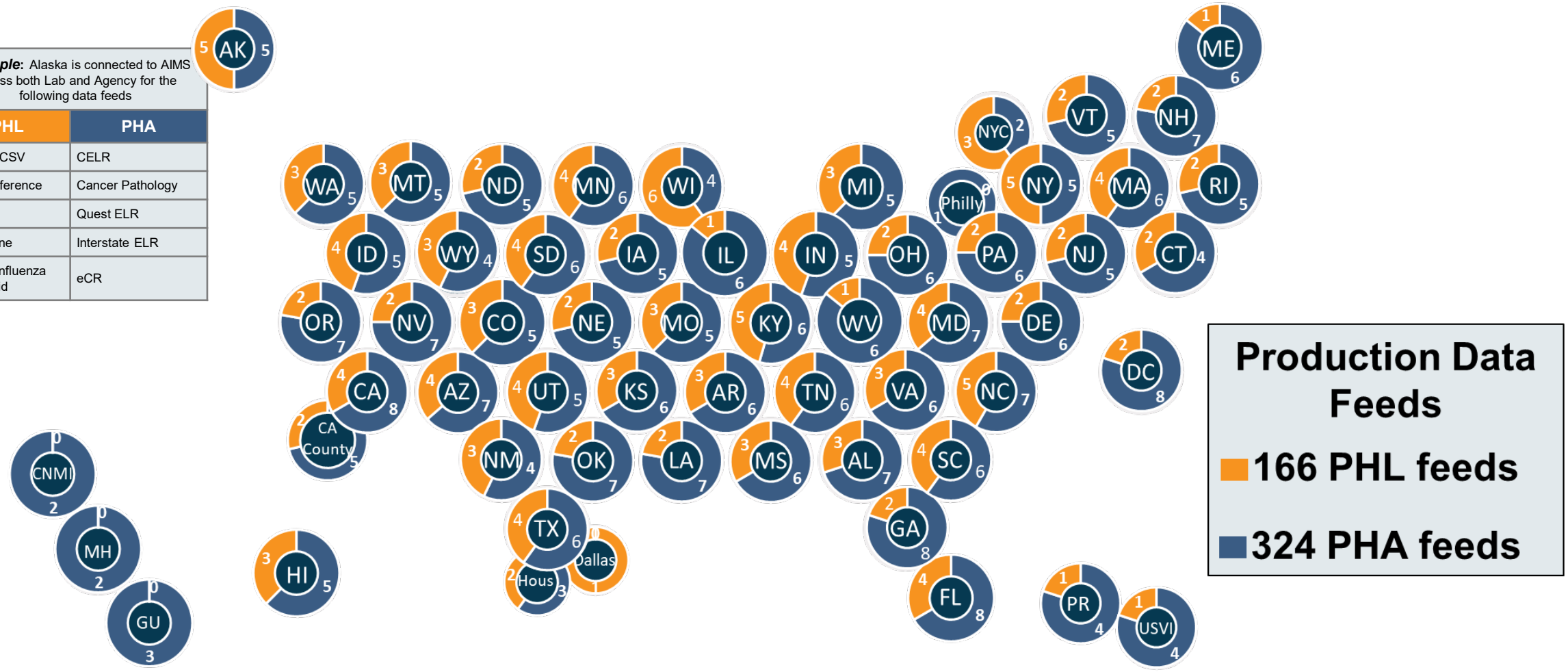
- **AIMS scalability initiative**
- Mirth commercial routing
- Process maturity
- Program and Team reorganization

		Transport	Transform	Validate	Route/Batch		Store	Host	Visualize	Dash
Electronic Lab Reporting	QUEST QLS	✓	✓	✓	✓	✓	✓	✓ Msg. Tracker		✓
	NHSN	✓		✓	✓	✓				✓
	QUEST SJC/CHA	✓	✓	✓	✓	✓	✓	✓ Msg. Tracker		✓
	QUEST Path	✓		✓	✓	✓	✓	✓ Msg. Tracker		✓
	ELIMS	✓			✓					✓
Interstate Messaging	ELR contact tracing	✓			✓					✓
Electronic Case Reporting	eCR eCR Now	✓	✓	✓	✓			✓ FHIR app ✓ RCKMS	✓	✓
COVID ELR	CELR	✓	✓	✓	✓	✓	✓	✓ Data Lake	✓	✓
Case Notifications	NNDs- MMGs	✓			✓					✓
	EIP	✓		✓	✓		✓	✓ Data Lake		✓
Laboratory Surveillance	Influenza	✓			✓					✓
	COVID	✓		✓	✓					✓
	ARLN: CRE CRPA	✓	✓	✓	✓		✓	✓ DAART		
	ARLN: Regional	✓	✓	✓			✓	✓ DAART		
	Rabies	✓	✓				✓	✓ Portal	✓	✓
	VPD - Regional	✓			✓					
ETOR- Web Portal	ARLN: Regional	✓	✓	✓			✓	✓ Lab Web Portal		

Current Status

Example: Alaska is connected to AIMS across both Lab and Agency for the following data feeds

PHL	PHA
ARLN – CSV	CELR
ARLN reference	Cancer Pathology
LRN	Quest ELR
Foodborne	Interstate ELR
PHLIP: Influenza and Covid	eCR



AIMS Current Data Transmission Stats

Project	
eCR	6.31 Mil
InterPartner	1.95 Mil
Quest	1.84 Mil
CentralizedELR	194.65 K
AMD	132.76 K
EIP	7.92 K
CancerRegistry	3.29 K

Use Case	
None	6.31 Mil
OTHER	1.84 Mil
QUEST_ELR	1.38 Mil
CELR	284.93 K
HL7	197.94 K
Flu	132.63 K
CentralizedELR	75.12 K

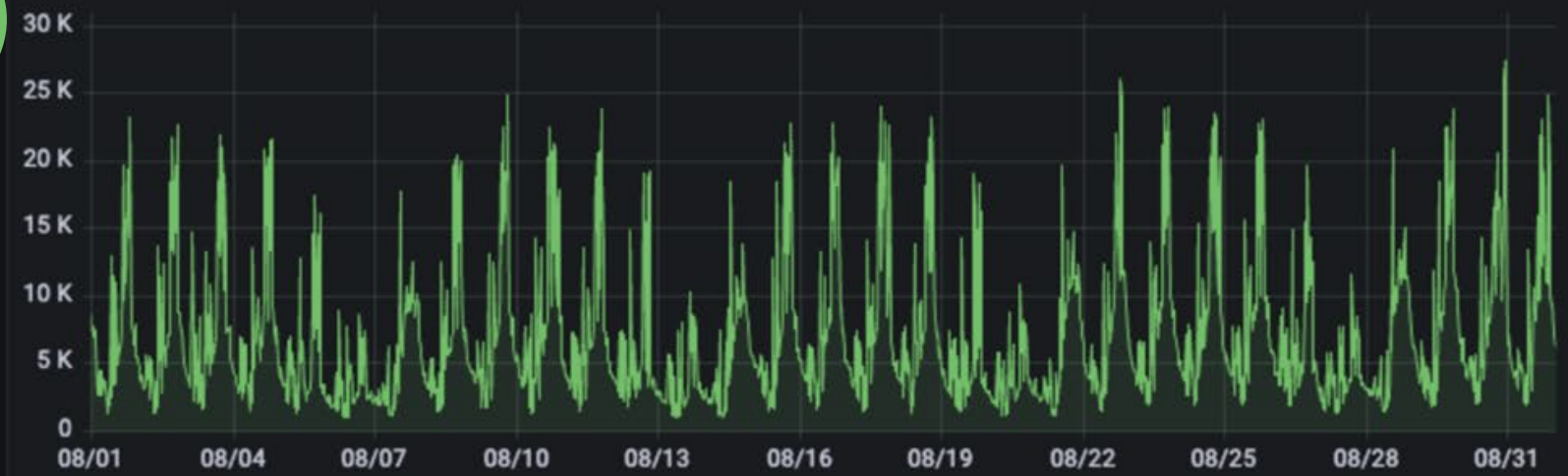
Sender	
QuestLabs	1.38 Mil
QUEST_TAMPA	1.12 Mil
ProvidenceORCA	369.63 K
direct.sw.org	299.45 K
NYULangoneHealth	293.95 K
ProvidenceWAMT	221.98 K
QUEST_TETERBORO	212.73 K

Recipient	
None	5.61 Mil
FL	2.40 Mil
AIMSPlatform	545.67 K
CA	328.49 K
NY	119.51 K
BA	117.22 K
GA	101.05 K

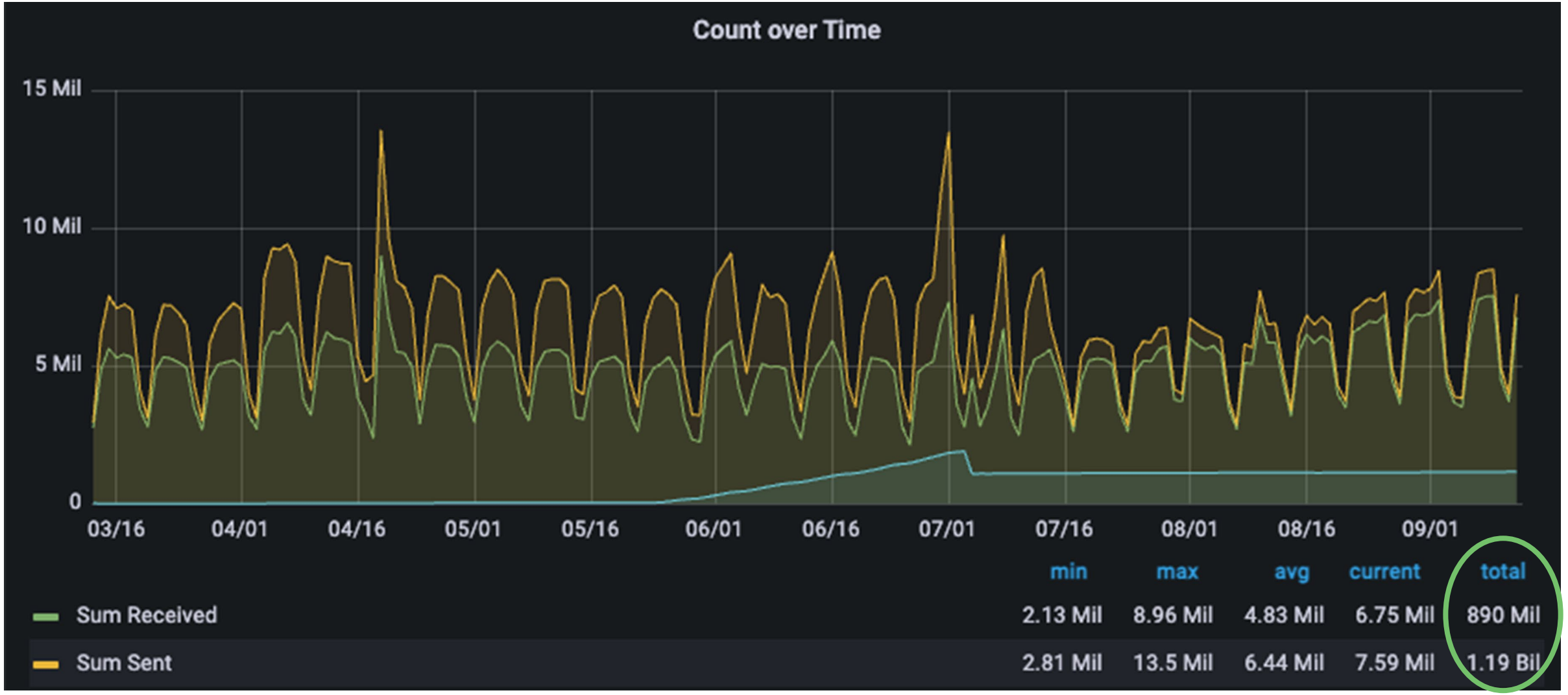
Environment	
Production	10.43 Mil
Test	6.69 K
staging	954.00
Staging	40.00

Status	
Processed	10.44 Mil
Error	872.00

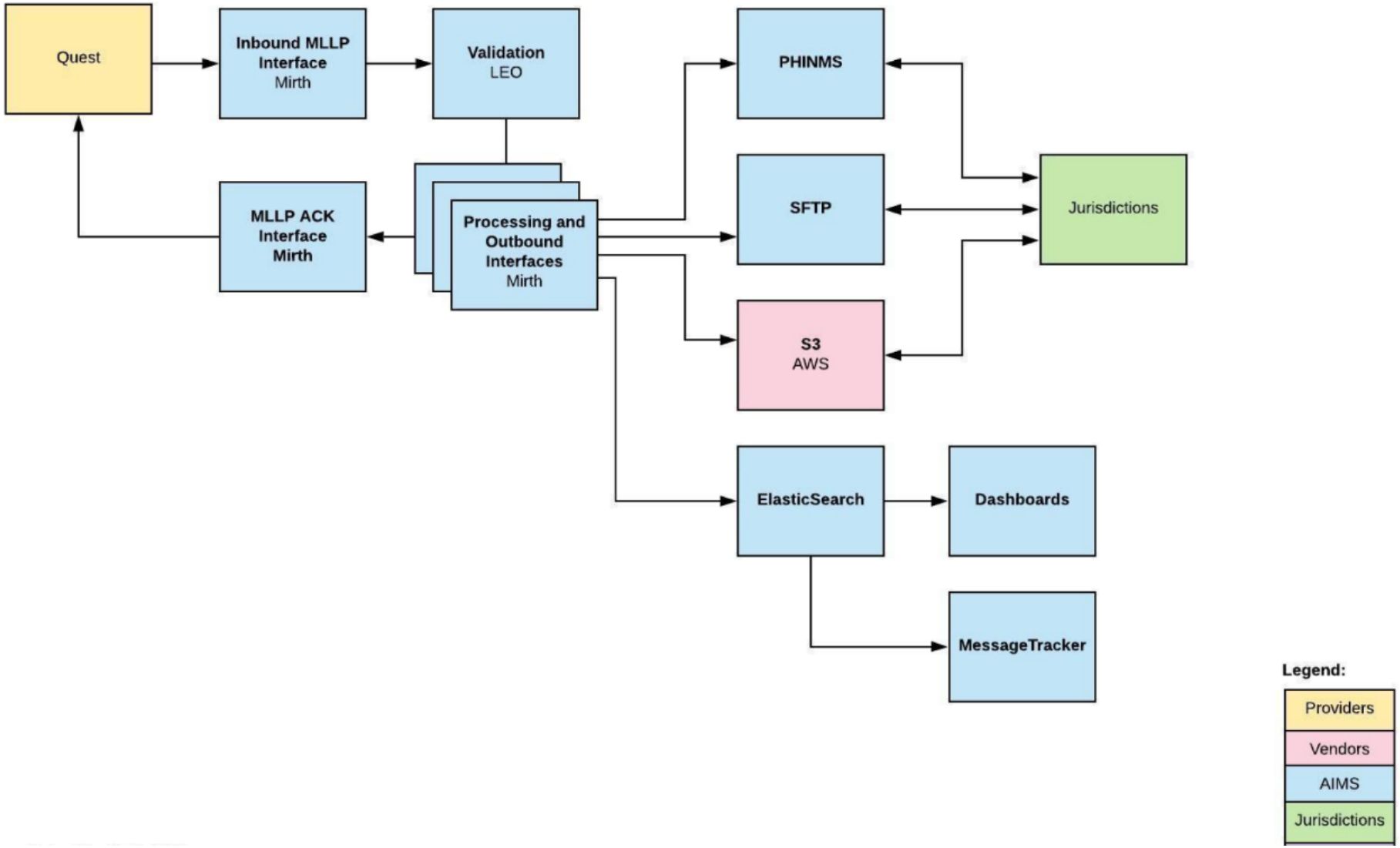
Messages over Time



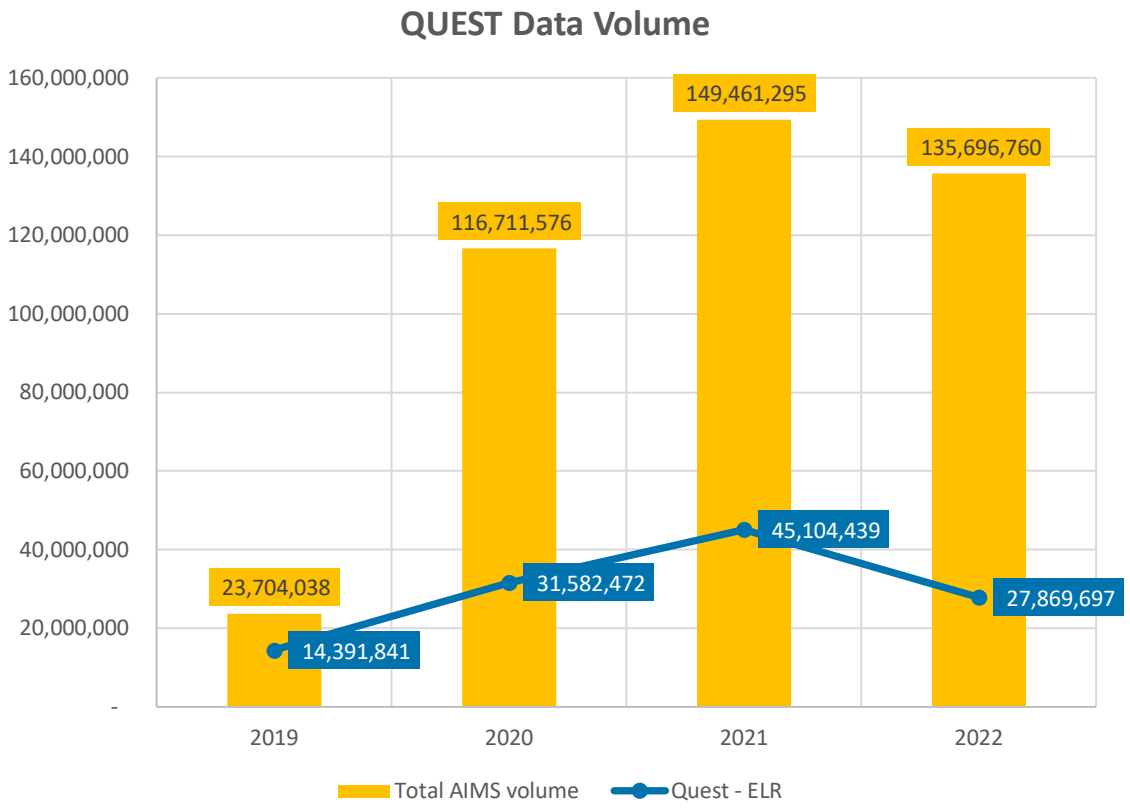
However, that is just the beginning…
Once received at the front door, Mirth gets down to the hard work



QUEST ELR Data Flow



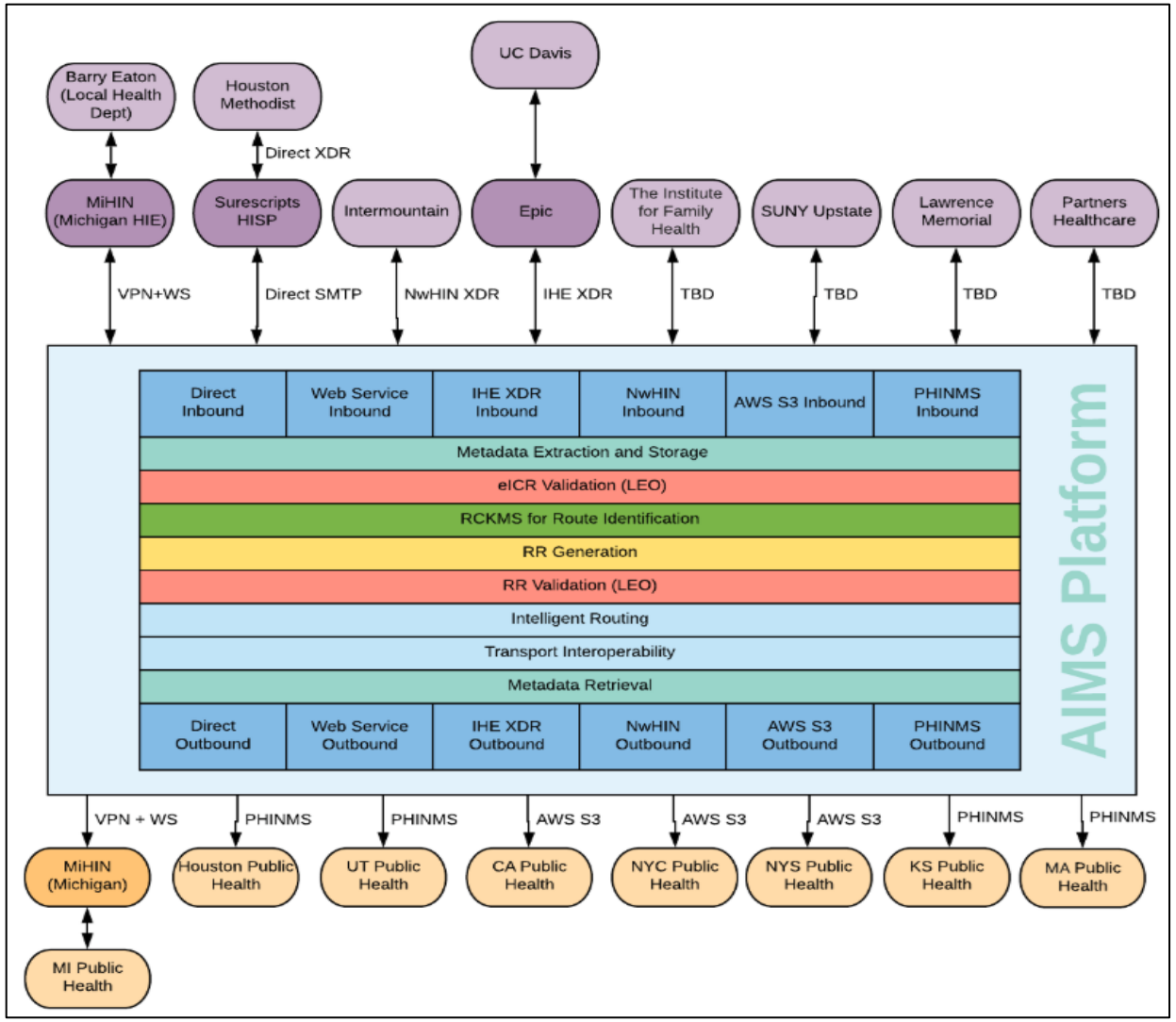
Through strict project scoping and the use of AIMS, the Quest ELR initiative accelerated the transmission of ELR data to PHAs. Providing tools and services to support sender and receiver needs.

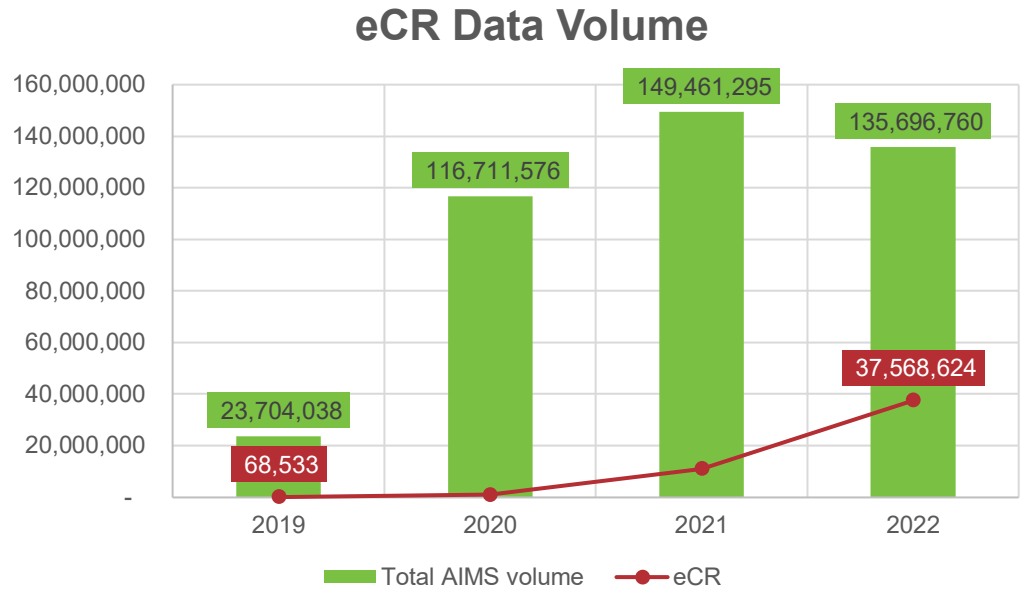


- Specialized Quest Message Tracker
- Seamless addition of COVID data to existing ELR feed
- Ability to repurpose and route line level MPOX data for CDC programs
- State specific delivery rules and filters in place across jurisdictions

Evolving - eCR

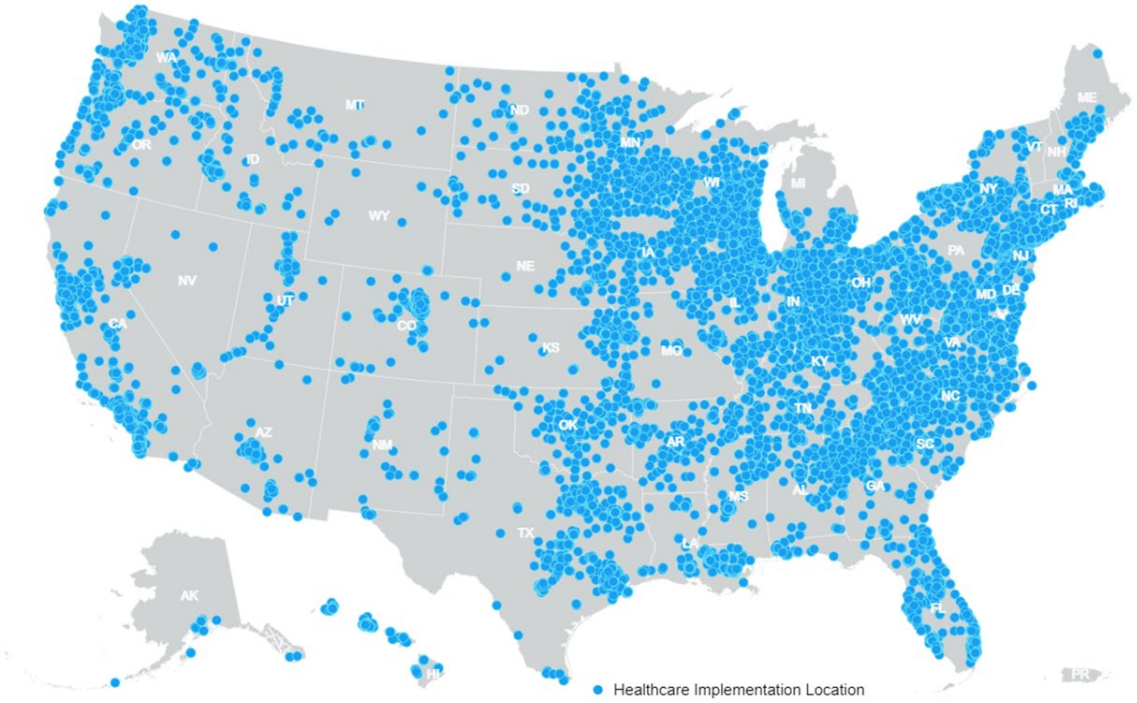
The eCR platform infrastructure speaks to the complex requirements of public health and the value of intermediaries to streamline high volume data exchange.





eCR By The Numbers

as of September 12, 2023



>28,800 facilities

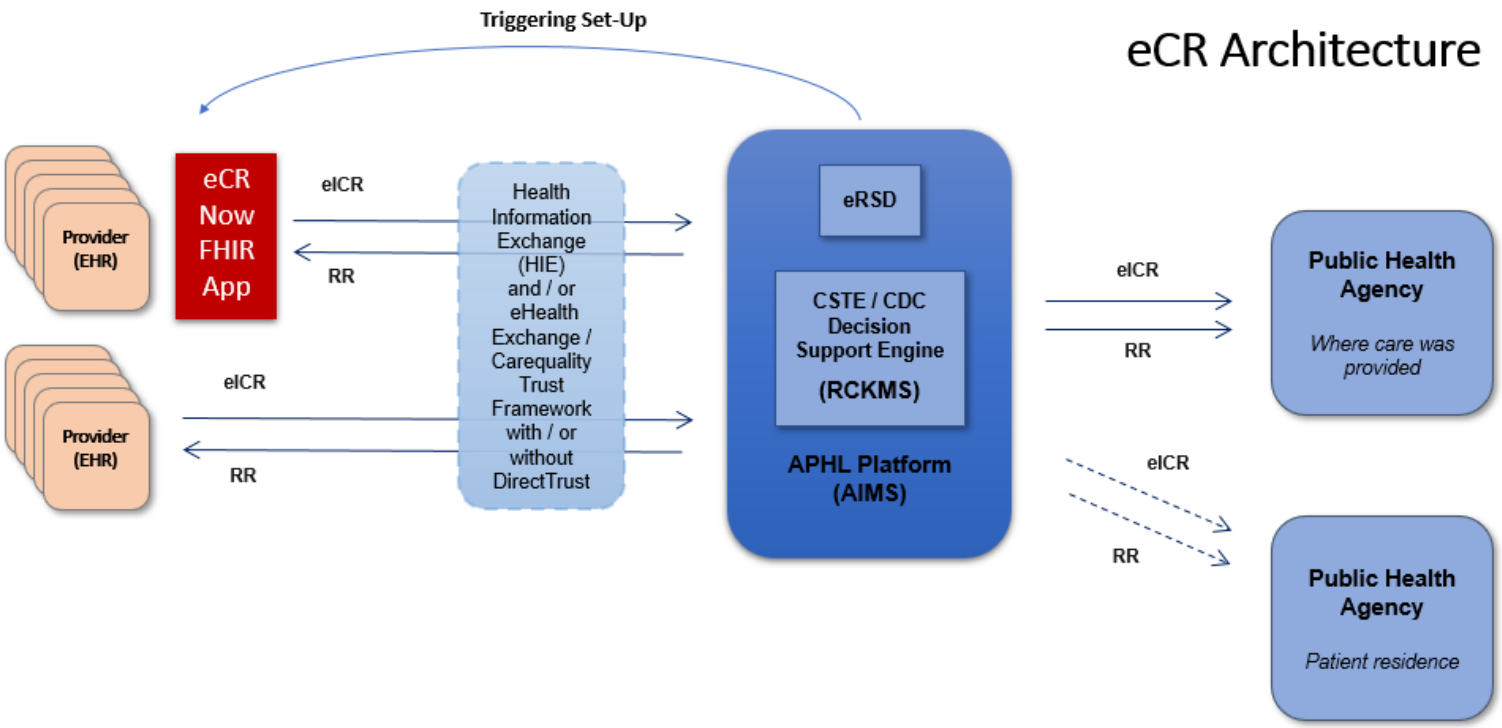
2,073 (28%) hospitals

355 (26%) Critical Access Hospitals

1,472 (11%) Federally Qualified Health Center service sites

11,441 (10%) ambulatory facilities staffed by MIPS providers

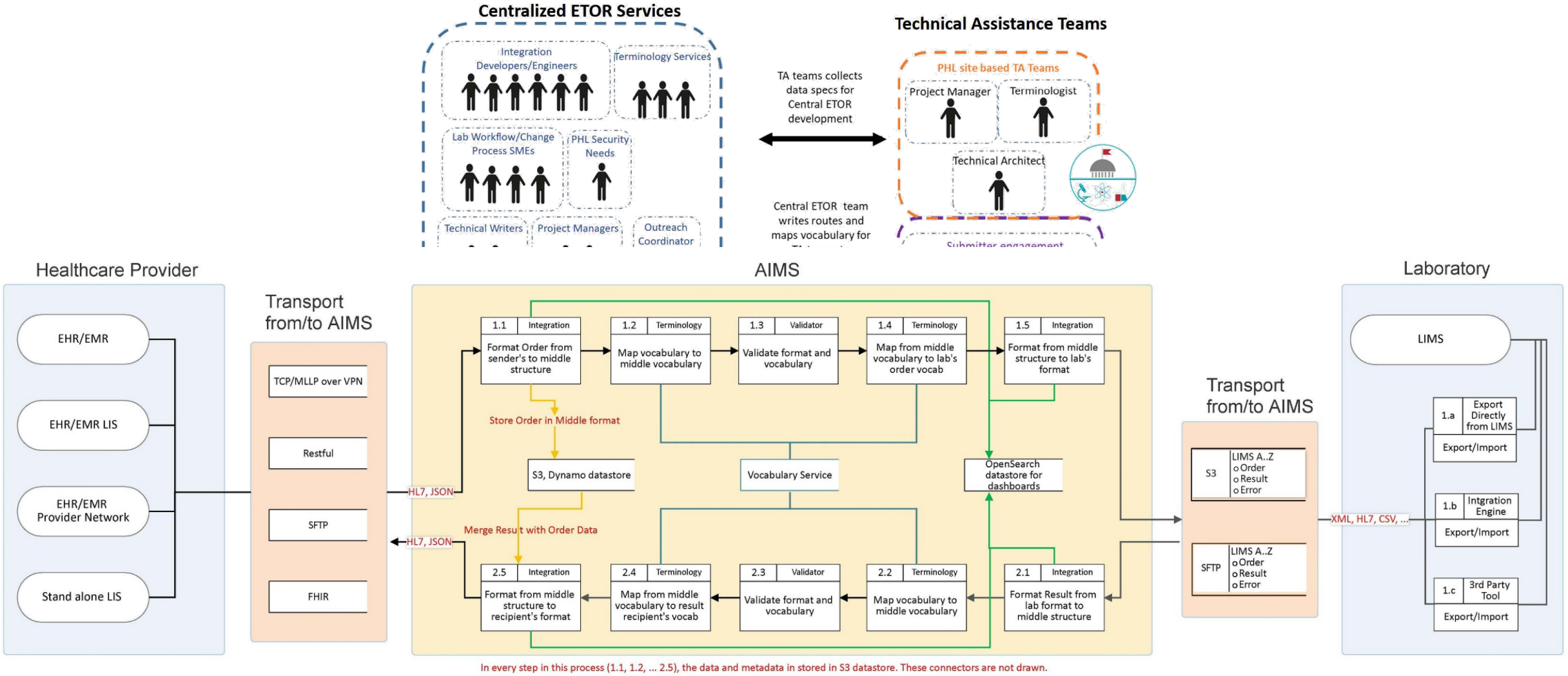
eCR and FHIR



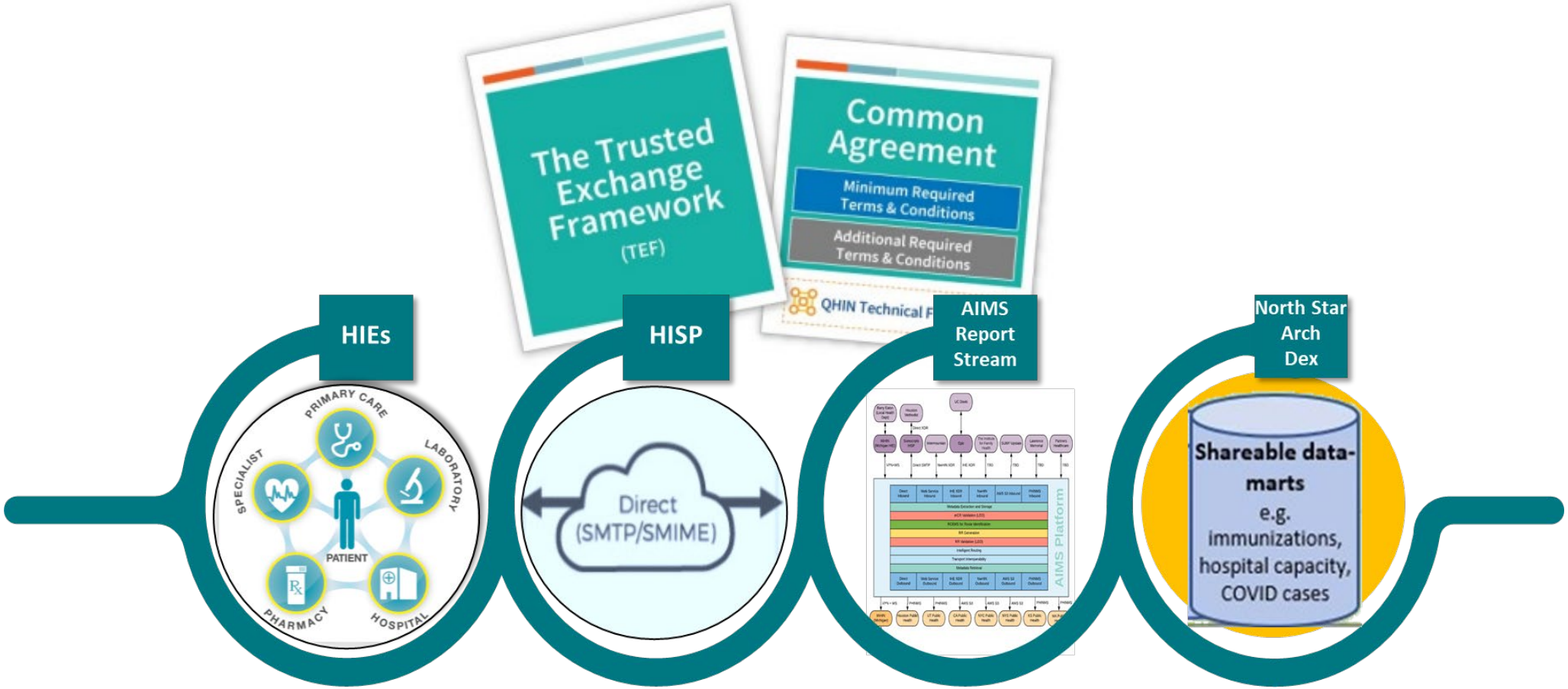
- The eCR Now App has effectively utilized the FHIR R4 API to extend eCR capabilities to EHRs lacking capability.
- Over half of all implementing EHRs use the eCR Now App to support eCR
- The launch of a CDA to FHIR transformation tool allows AIMS to support public health agencies manage FHIR data and support the transition to FHIR

Future - ETOR

AIMS and other intermediaries can leverage ELR and eCR technology, processes and relationships to facilitate Electronic Test Order and Result, ensuring public health and clinical care can communicate effectively



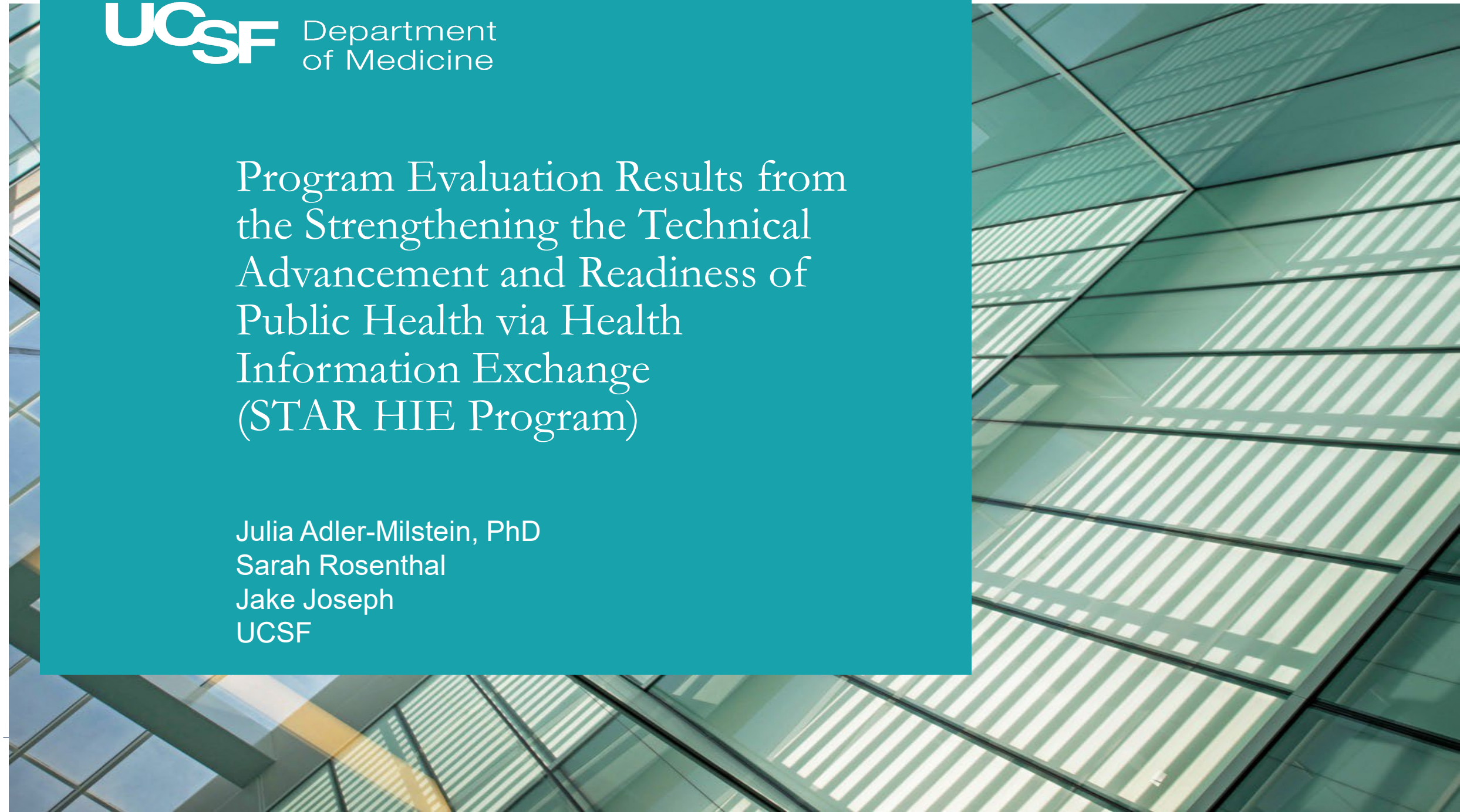
As we continue to make progress on critical path PHDS goals – the evolution of existing tools and services continues..



UCSF Department of Medicine

Program Evaluation Results from the Strengthening the Technical Advancement and Readiness of Public Health via Health Information Exchange (STAR HIE Program)

Julia Adler-Milstein, PhD
Sarah Rosenthal
Jake Joseph
UCSF



STAR HIE Program

Strengthening the Technical Advancement & Readiness of Public Health via Health Information Exchange Program

- The STAR HIE Program overall was a $5 million cooperative agreement program designed to **strengthen and expand the ability of health information exchanges (HIEs) to support public health agencies (PHAs)** in their response to public health emergencies and pandemics such as COVID-19.

- The first award of $2.5 million consisted of 5 original STAR HIE grantees which is the focus of this evaluation.

- The STAR HIE Program has the following **objectives**:
  - Build innovative HIE services that benefit PHAs.
  - Improve the HIE services available to support communities disproportionately impacted by the COVID-19 pandemic.

- **The original STAR HIE 5 recipients**: Georgia Health Information Network (GaHIN), HealthShare Exchange of Southeastern Pennsylvania (HSX), Kansas HIE (KONZA), Texas Health Services Authority (THSA), Contexture (Health Current AZ)
- A supplemental award of $2.5 million was provided to 4 out of the 5 original grantees and 17 other grantees that focused on connecting HIEs to IIS.

Brief Overview of Awardee Activities

GaHIN

- Increased COVID-19-related ELR and eCR to Georgia Depts of Public Health and Community Health (DPH and DCH) by extracting data from participants' lab and ADT feeds
  - Criterion for reporting established by DPH and DCH
  - Recruited participants from less-connected settings – the VA, correctional facilities, and rural hospitals – to increase understanding of COVID-19 impact within target populations
- Enriched ELR with patient demographic and clinical data

HSX (PA)

- Increased COVID-19-related ELR data feeds to PHAs and eCR to the CDC AIMS platform
  - Recruited participants based on local PHA guidance
- Leveraged MPI to increase completeness of COVID-19 data within comorbidity risk scores, race/ethnicity data, and mobility impairment data

Brief Overview of Awardee Activities

KHIN dba KONZA

- Developed TRANSLATE to increase COVID-19 test result reporting by mapping EHR HL7 feeds to ELR
  - Worked with the Athena, Next Gen and Qvera (EHR products) to send COVID-19 lab results to state public health departments for KONZA participants
- Adapted an alerting platform to create a COVID-19 registry for the Kansas Department of Health and Environment. Supplemented that platform with clinical and demographic data to provide a more complete view of patient's COVID-19 care.

THSA

- Recruited a pilot hospital (large, urban health system) and scoped technical needs
- Automated situational awareness reporting of PPE, ventilators, and hospital capacity (beds, ICU rooms) using SANER's FHIR Implementation Guide at the pilot hospital to fulfill state reporting requirements

Brief Overview of Awardee Activities

Contexture (Health Current AZ)

- Original scope: Utilize the HIE to facilitate hospital electronic submission of federal- and state-mandated reporting of non-clinical PH measures (e.g., PPE, supplies, ventilator use).
  - The complexity of this type of reporting, the lack of standardized coding, and competing demands of hospital resources became apparent after engaging with pilot hospitals.
  - In Q3 2021, re-scoped as there were no clear paths to automate these processes such that reporting burden wouldn't actually be reduced.
- Re-scoped proposal: Master Person Index (MPI) planning for Arizona to be initially used by the Arizona Department of Health Services (ADHS)and Arizona's Medicaid Agency, the Arizona Health Cost Containment System (AHCCCS). Benefits include:
  - Build innovative HIE services that benefit PHAs, including increased access to information to respond to public health emergencies.
  - Improve the HIE services available to support communities disproportionately impacted by COVID-19 by creating a common denominator across agencies.

STAR HIE Program Evaluation

- The evaluation of the 5 “original” STAR HIE awardees aimed to assess:
  - the Program’s impact on HIE-PHA relationships
  - methods to alleviate reporting burden for PHAs
  - sustainability, replicability, and lessons learned for all recipients within the cooperative agreement
  - successes and challenges associated with meeting programmatic milestones

- Program evaluation results serve to guide future investments and efforts to advance HIE for public health use cases across policymakers, HIE networks, PHAs, and other health system stakeholders.

- Results presented today reflect the totality of learnings across interim and summative evaluations.

Evaluation Approach: Mixed Methods

Quantitative

- Direct and/or proxy measures of progress in advancing HIE
- Examples of measure types:
  - Increased number of participants
  - Increased breadth of data exchanged
  - Increased volume of exchange
  - Improved data quality, completeness, etc.

Qualitative

- Interview key stakeholders to assess their experience with program implementation
- Use an implementation science framework (CFIR) that asks about different domains
- Identify key themes across awardees

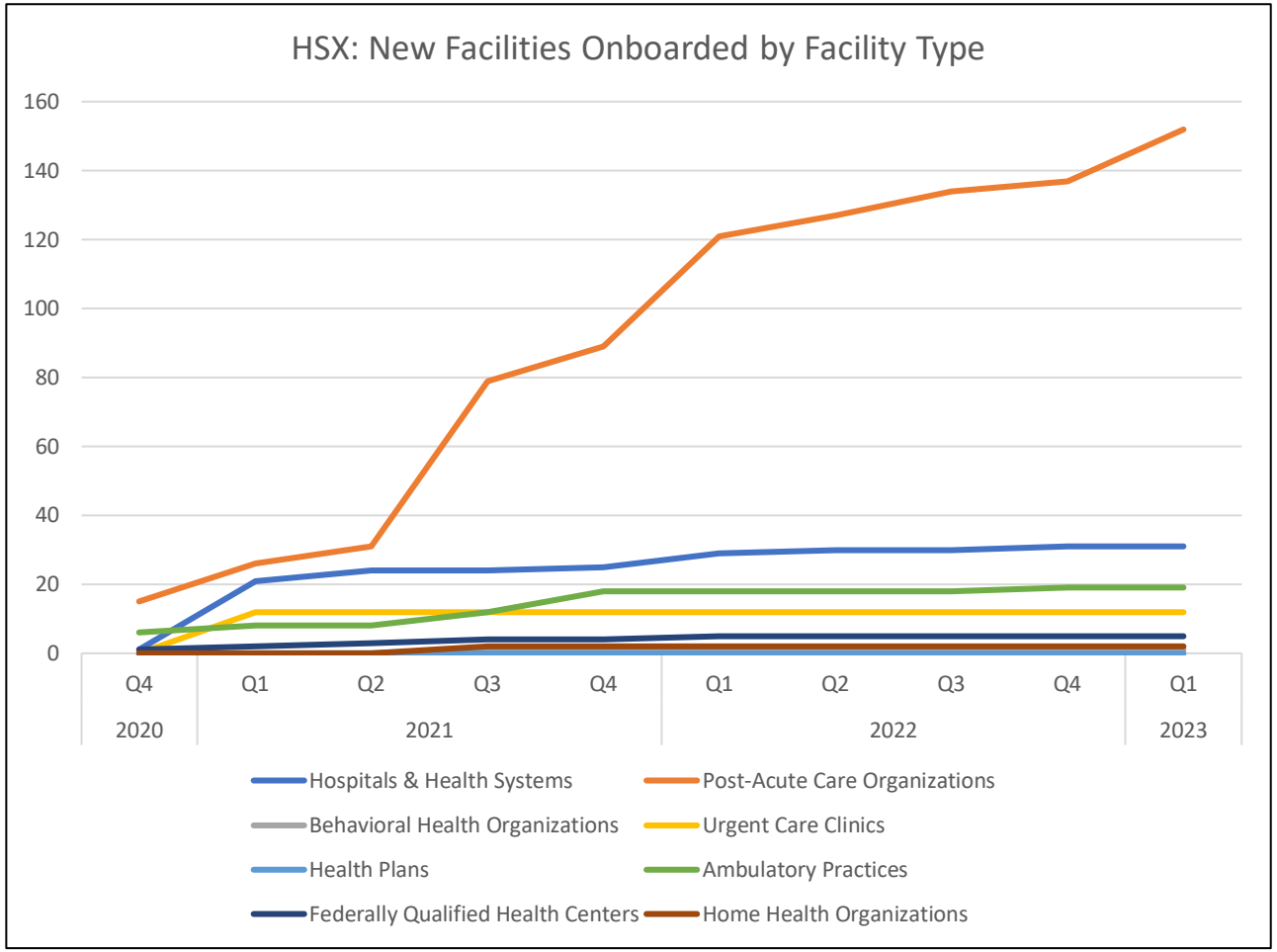
Results: Measures of Program Progress

Quantitative Measure Type	GaHIN	HSX	KONZA	THSA	Contexture (Health Current)
New Participants		✓			
New Data Feeds		✓			
ELR Volume		✓	✓		
eCR Volume	✓				
COVID-19 Registry Volume	✓	✓	✓		
Data Completeness			✓		
Notes on Data:	.			Quantitative data unavailable at time of evaluation.	No quantitative data associated with project activities

UCSF

Expanded Participation: New Participants

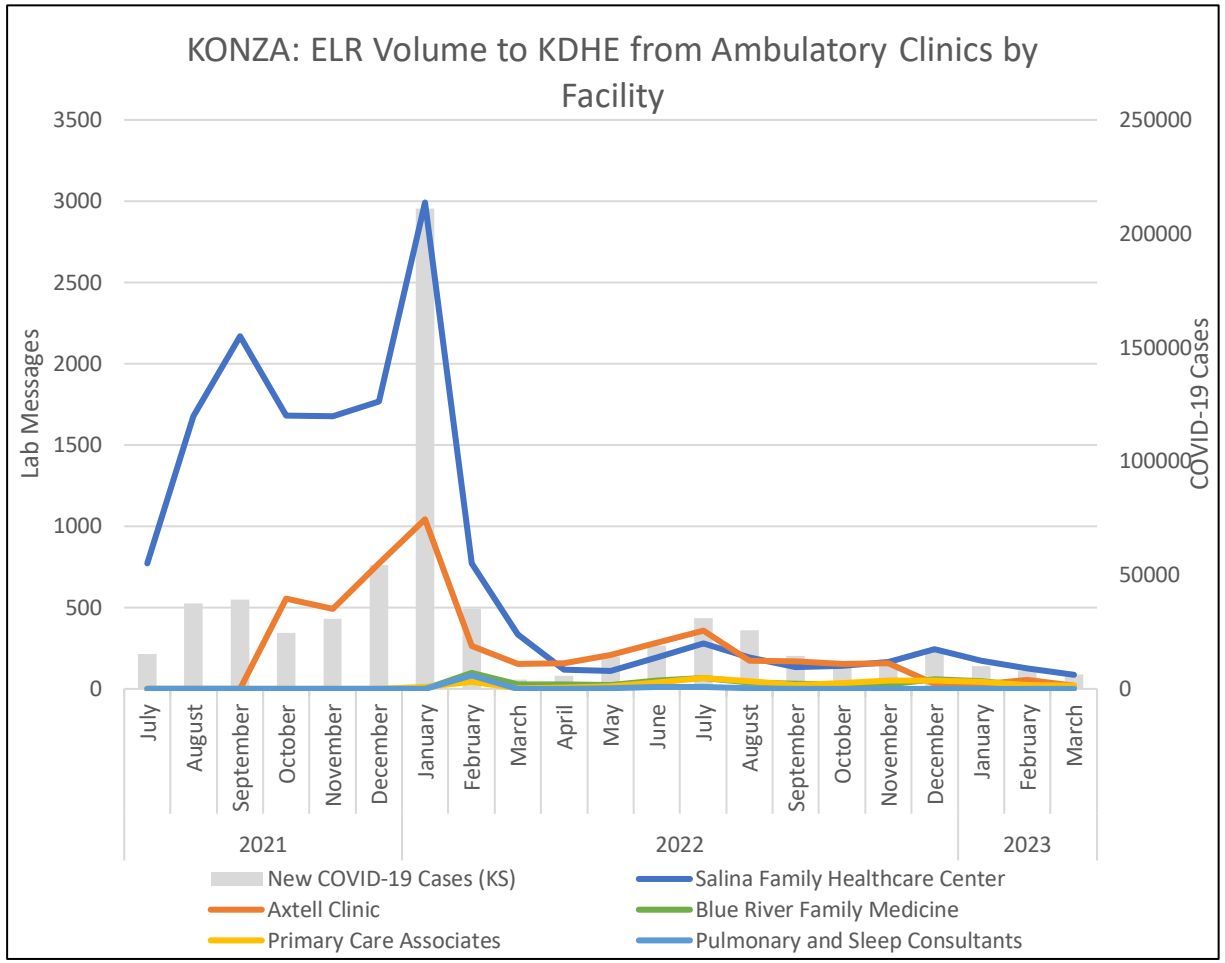
HSX



HSX onboarded 152 post-acute care (PAC) organizations by connecting to a PAC EHR vendor with a hub HIE model, allowing them to scale quickly.

Electronic Lab Reporting Volume

KONZA

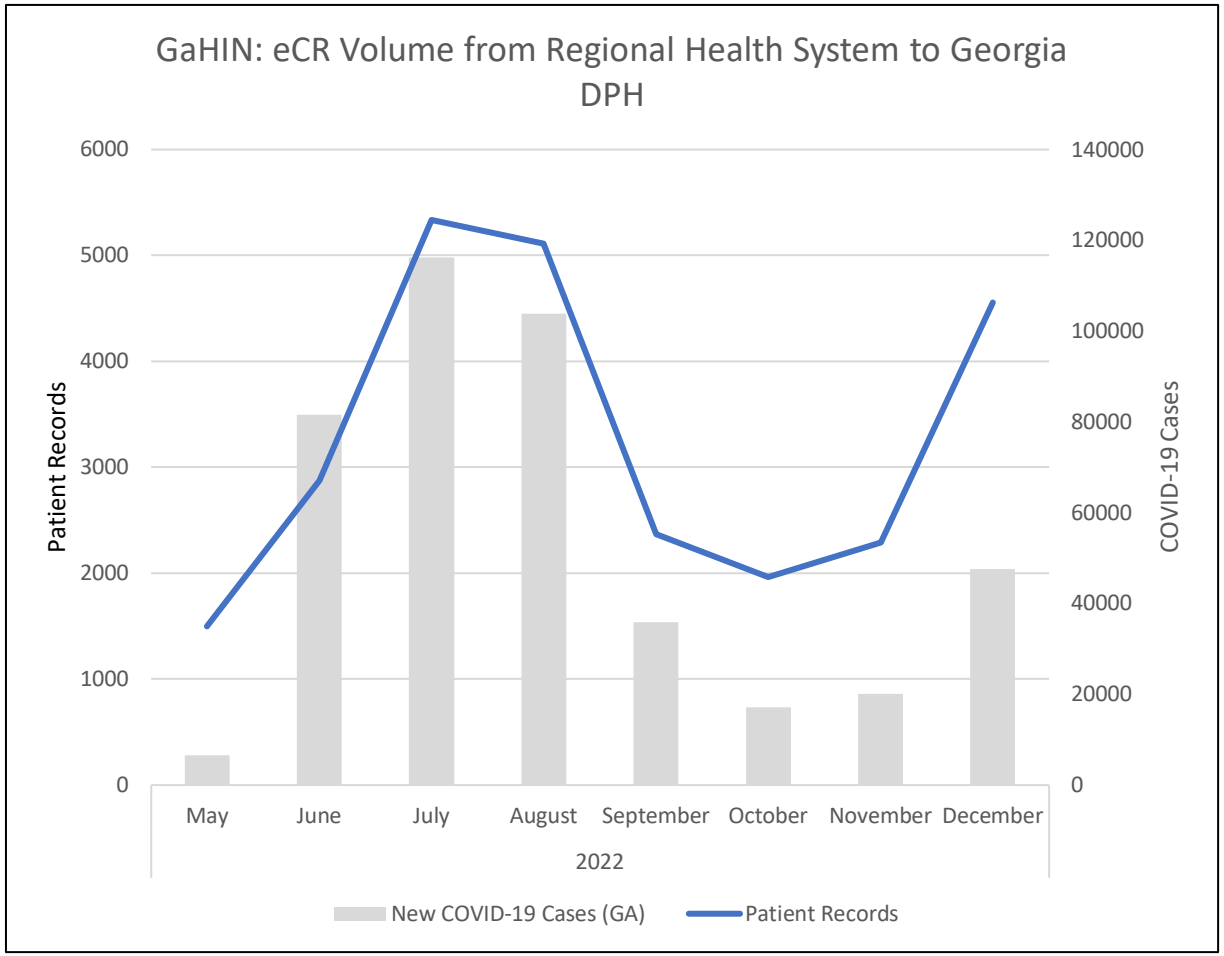


KONZA connected 5 ambulatory clinics to ELR during the Program period, which allowed them to increase ELR volume for COVID-19 test results.

ELRs were sent to the Kansas Department of Health and Environment through KONZA's ELR TRANSLATE product

Electronic Case Reporting Volume

GaHIN

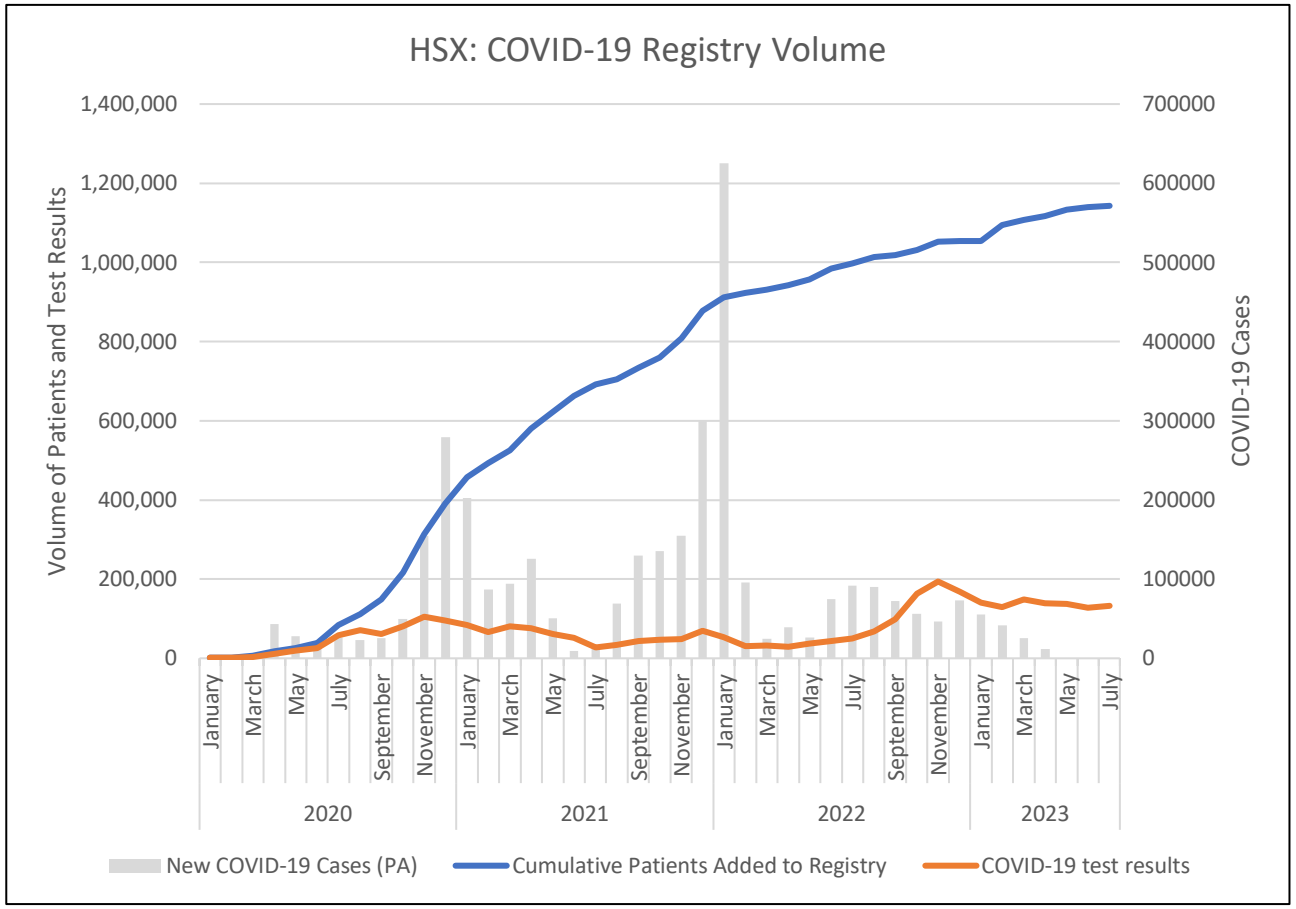


GaHIN onboarded their first organization to eCR in May 2022 – a major regional health system that reports COVID-19 cases as well as other reportable diseases to the Georgia DPH.

In total, 25,984 eCRs were submitted.

COVID-19 Registry Volume

HSX

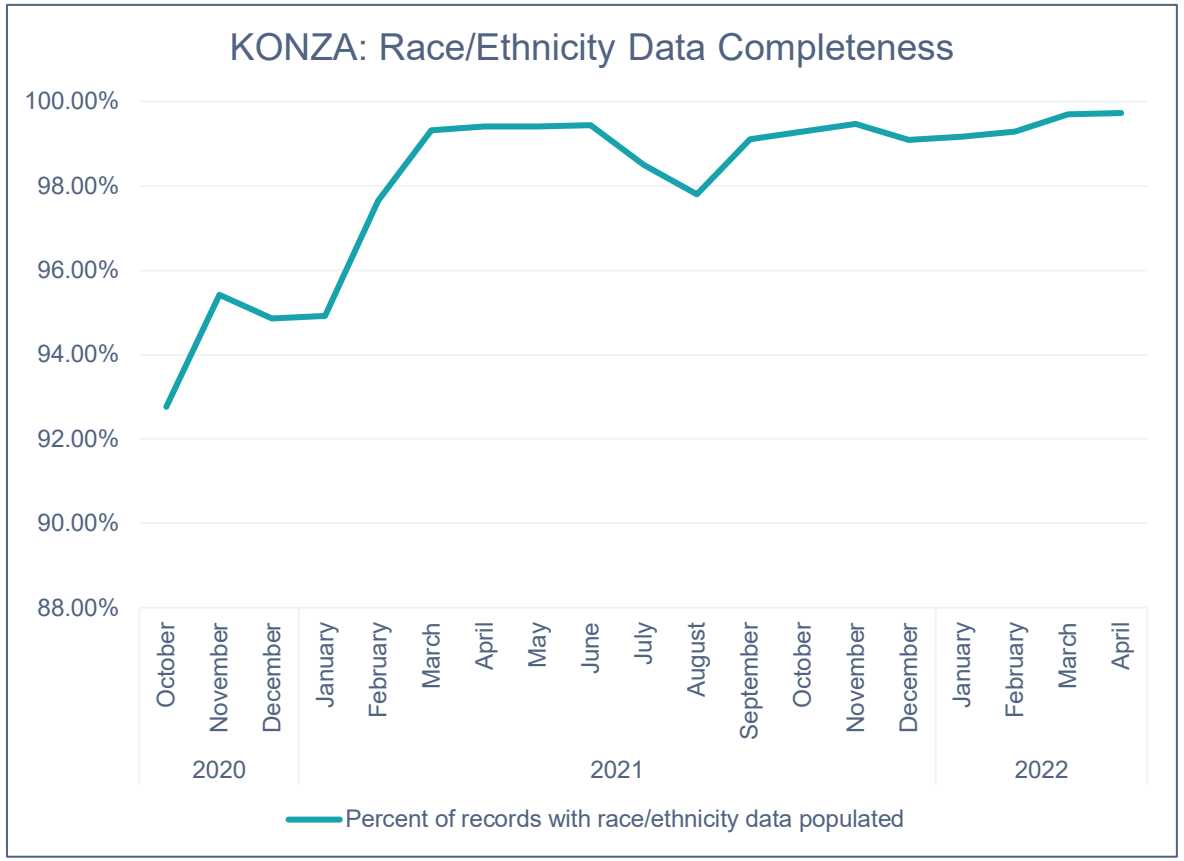


HSX developed and operates their own COVID-19 registry that includes COVID-19 test results and unique patient records. PHA partners access these data through reports that HSX generates and sends.

Cumulatively, the registry captured 1,143,376 unique patients and 3,147,486 COVID-19 test results.

Data Completeness

KONZA



While starting at a high level, KONZA was able to increase race/ethnicity data completeness.

They did so by setting up a COVID-19 registry to bring together data from multiple participants and PHAs.

Results: Key Qualitative Themes

Recruited and conducted 29 interviews with 36 interviewees across all 5 recipients and their stakeholders.

Recipient	Number of Interviews Completed (Interviewees)	Dates Interviews Were Conducted	Types of Stakeholders Interviewed
GAHIN	6 (7)	February – March 2023	Recipient, technical vendor, PHA, supporting HIE, participant
Contexture (Health Current AZ)	4 (4)	March – April 2023	Recipient, PHAs
KONZA	7 (9)	May 2023	Recipient, technical vendor, participant, PHA
THSA	7 (7)	June – July 2023	Recipient, technical vendors, supporting HIE, PHA, pilot site
HSX	5 (9)	June – July 2023	Recipient, pilot sites, PHAs

Results: Key Qualitative Themes

Theme 1A

Successful HIE efforts under the Program included leveraging more complete patient data to bolster ELR and eCR.

- Awardees were able to quickly develop ELR and eCR services and "switch" participants to electronic reporting methods
- Multiple awardees combined information from existing data feeds and their MPIs to supplement COVID-19-related data.

Results: Key Qualitative Themes

Theme 1B

Novel technical approaches and reporting use cases also made progress but faced more substantial challenges.

- Relative to ELR and eCR, capacity reporting proved more challenging.
  - HIEs, PHAs, and providers had to reach a common understanding of how to measure items (e.g., PPE, bed count) and develop methods to automatically extract these data from sources beyond the EHR
  - These issues became a key barrier to progress – especially amid high personnel turnover, technological difficulties, limited funding, and competing priorities.
- Recipients had also hoped to use novel technical approaches such as FHIR and API-based reporting but found them insufficiently mature and fell back on established methods.

Results: Key Qualitative Themes

Theme 2

Reporting burden reduction was salient for providers but not realized to the same extent on the PHA side.

- For providers, HIEs' services provide a clear, meaningful reduction in public health reporting burden
  - HIEs guide providers through onboarding, interface with vendors and PHAs, and provide technical assistance as needed
- For PHAs, HIEs' services represent only one of many sources of inbound data to PHAs, diluting a reduction in burden
  - As one PHA stated: *"[ELR from the HIE was] a drop in the ocean because we were getting COVID data from everybody. We did appreciate it because it came consistently, came HL7®, and came automatically, so we didn't have to worry about data entry errors that are made when people enter data in through the portal."*

Results: Key Qualitative Themes

Theme 3

There is no single optimal use case for how HIEs can best support public health reporting.

- All projects under the Program were perceived as creating important value, yet none were described as transformative.
  - Particularly valuable were the timeliness of reporting services and data completeness
  - Yet, no single service stood out as essential or groundbreaking for pandemic response efforts

- When designing services to cater to public health needs, HIEs must still take on the challenging work of aligning stakeholders with differing incentives, complex regulations, and varied technical capabilities.

Results: Key Qualitative Themes

Theme 4

Ongoing sustainability is shaped by a broad array of factors that influence which services will continue and scale after the Program while others will be placed on hold until they may be needed in future public health emergencies.

- Policies (e.g., state mandates for standards-based reporting, return of suspended HIPAA requirements)
- Funding – some PHA engagement with Program activities was hampered by lack of funding (e.g., lacking staff to parse and aggregate ELR data from HIEs)
- Scalability of solutions – particularly across EHR vendors
- Ongoing perception of urgency (i.e., ranging from none to ongoing related crises like natural disasters)

Results: Key Qualitative Themes

Theme 5

The STAR HIE Program meaningfully altered the trajectory of the relationships between PHAs and HIEs.

- By providing funding and incentives for PHAs and HIEs to closely collaborate and advance shared goals, the STAR HIE Program markedly strengthened relationships between HIEs and PHAs.
  - PHAs gained new understanding of HIE capabilities
  - They are interacting more (via standing meetings or other regular correspondence)
  - They are approaching each other with new, collaborative projects

HIE:	“The [STAR HIE] Program served as the catalyst for building the bridge between HIE and public health partners.”
PHA:	“Having the STAR opportunity has fueled a lot of relationship building with [the HIE], and we have tapped them for new projects we’d like to do.”

Conclusions

- Results from STAR HIE Program can guide future efforts to leverage HIE capabilities to meet public health needs.

- Given that the original program sought to seed five diverse HIE efforts, make progress in HIE-supported public health reporting, and learn from their experiences, the evaluation suggests that it fulfilled its overall objectives and made progress in key areas:
  - HIEs provided timely and more complete data to PHAs
  - HIEs built capabilities that serve public health use cases
  - HIEs laid a foundation for ongoing future bidirectional HIE-PHA collaborations on a broader set of public health needs


UCSF
University of California
San Francisco

A New Way to Exchange Immunization Data from Ohio

Brian Fowler, Chief, Public Health Informatics, ODH

Dan Paoletti, CliniSync CEO

ONC Tech Forum

September 21, 2023

Ohio | Department of Health

Partnerships

Why Sharing Data is Important

- Helps improve immunization rates.
  - Ohio clinicians should have access to immunization data.
  - Clinicians in other states should have access to Ohio immunization data for patients who have moved or seek care in other states.
- Existing ways of accessing data include:
  - Manual entry/lookup in Ohio's immunization registry.
  - Data feeds set up through Promoting Interoperability.

Plan to Exchange Data with CliniSync

- ODH will provide CliniSync with data from Ohio's immunization registry.
  - Legal agreements have been signed between ODH and CliniSync.
  - A technical project to set up data transfer is scheduled to begin shortly.
- CliniSync will share data with Ohio providers and through eHealth Exchange.
- Real-time, bidirectional exchange will continue to be available and encouraged for interested providers in Ohio.

QUESTIONS?

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Our Mission: Advancing the Health and Well-being of All Ohioans.

Ohio | Department of Health

Q&A: Deeper Insights into Public Health Exchange and the Role of Networks

Break: Please return at 1:30pm ET

Current State of Public Health Exchange: State and Local Perspectives

Dawn Nims and Megan Patel (Illinois Department of Health); Sarah Solarz (Minnesota Department of Health) and David Johnson (Hennepin County, MN); and Benjamin Schram (North Dakota Department of Health)

How Vital Records Death Certificate Automation Has Improved Mortality Surveillance and Reporting in Illinois

Dawn Nims, MPH
Megan T. Patel, MPH

September 21, 2023

Background

- The Illinois Department of Public Health (IDPH) developed automated processes to import vital records death certificate data to the infectious disease surveillance reporting system
- These processes identify new cases of unreported infectious diseases (established in 2012) and update current cases of infectious disease with mortality information (established in 2017)
- Details on causes of death are logged within the reporting system for analysis

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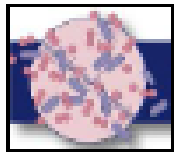
I-NEDSS & IVRS

I-NEDSS

- Illinois – National Electronic Disease Surveillance System
- Home-grown, JAVA based, person/event hybrid centric model
- Disease surveillance system for general communicable diseases and STIs (chlamydia and gonorrhea)
- Utilized by state and local health department users since 2005



I-NEDSS

IVRS

- Illinois Vital Records System
- Electronic vital records system for birth and death records
- Utilized by state and local officials since 2008

IVRS

IDPH
Illinois Department of Public Health

Person Summary

User Name: DAWN NIMS

Name: [redacted]
Current Address: [redacted]
Champaign, IL [redacted]
Champaign

Birth Date: [redacted]
Sex at Birth: Female
Home Phone:

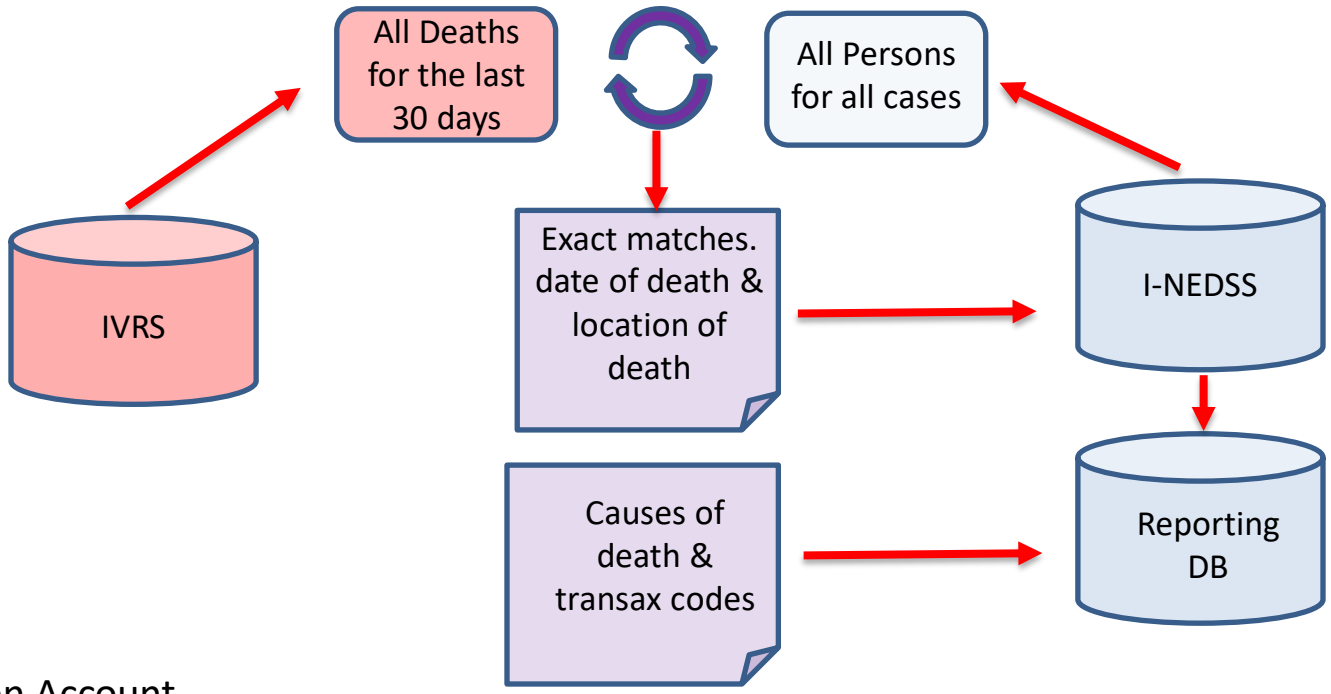
Names | Identifications | Phones | Addresses | Demographic

Disease	Event Date	Disposition	Case Status	Investigation Status	Investigator	Jurisdiction
Rubella	02/22/2021		Suspect	In-Progress		Chicago Department of Public Health
Botulism Foodborne	12/02/2020		Confirmed	In-Progress	UGRAPPA, VINAY	Illinois Dept of Public Health Central Office
Lyme Disease	05/02/2022		Probable	In-Progress	UGRAPPA, VINAY	Illinois Dept of Public Health Central Office
SARS-CoV-2 infection (COVID-19)	11/11/2020		Confirmed	In-Progress	UGRAPPA, VINAY	Illinois Dept of Public Health Central Office

Add Case

IDPH
Illinois Department of Public Health

I-NEDSS & IVRS Integration: Death Match- Person Match



1. Death Match to Person Account
   - Exact match on First Name, Last Name, DOB, and Gender; if no match found, then discard
   - If a single person matches:
     - I-NEDSS application is updated: Deceased = yes; Date of death
     - Reporting database is updated with all causes of death & coded transax fields

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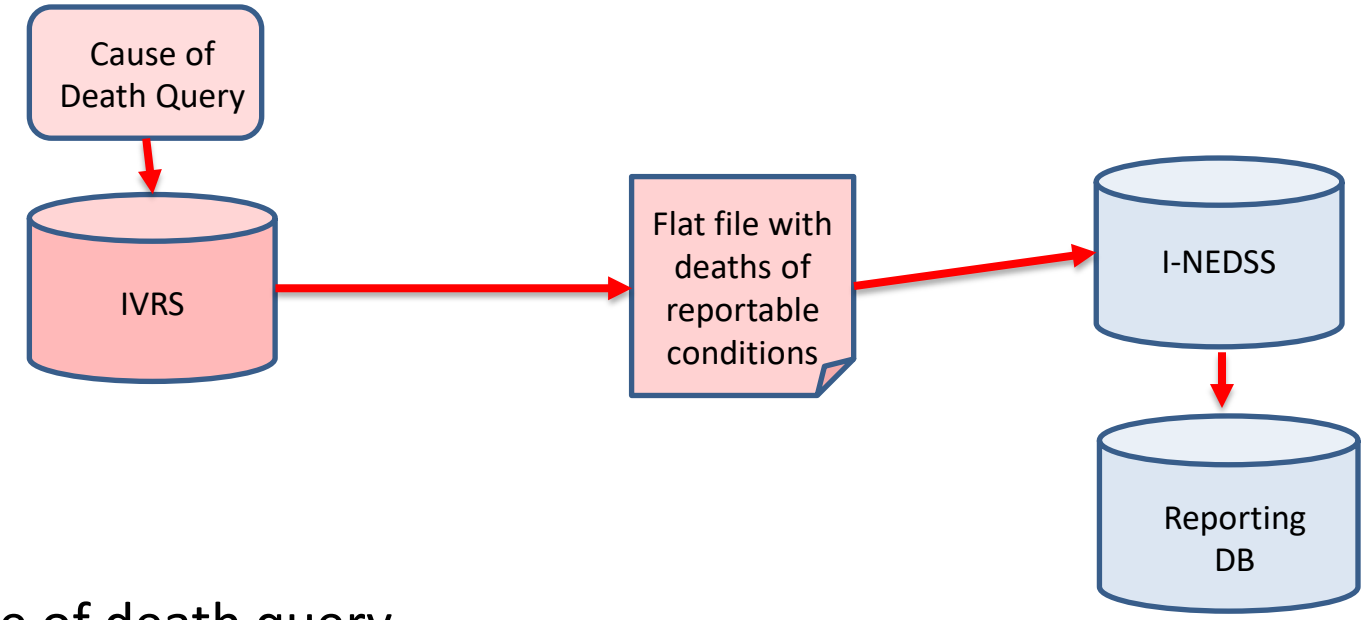
Illinois Department of Public Health

I-NEDSS & IVRS Integration: Cause of Death Query



2. Cause of death query

- Daily flat file for deaths due to reportable conditions for the past day
  - Reportable conditions from disease list
- Send daily in a ~=~ delimited flat file that contains deaths by reportable diseases
- Flat file is uploaded into I-NEDSS that produces a death certificate report to review and merge into the appropriate I-NEDSS case (disease-specific)

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I-NEDSS & IVRS Integration: Cause of Death Query Cont..

DISEASE_KEY	DISEASE_NAME
CRVN	CARONA VIRIS
CRVN	CARONA VIRYS
CRVN	CARONAVIRUS
CRVN	CORONA VIRIS
CRVN	CORONA VIRUS
CRVN	CORONA VIRYS
CRVN	CORONAVIRUS
CRVN	COV
CRVN	COVID
CRVN	COVID 19
CRVN	COVID-19
CRVN	NOVEL CORONA
CRVN	NOVEL CORONA COVID-19 VIRUS INFECTIOI
CRVN	NOVEL CORONAVIRUS 19
CRVN	NOVEL COVID 19
CRVN	NOVEL COVID-19
CRVN	SARS-COV
CRVN	SARS-COV-2
DENGU	DENGUE
DIPH	DIPTHERIA
EEWI	EWINGII
EHCNS	SHIGA TOXIN
EHGA	PHAGOCYTOPHILUM
EHME	E CHAFFEENSIS
EHME	EHRLICHI
EHRL	ANAPLASM
GIAR	GIARDI
HAEMO	H FLU
HAEMO	H INFLUENZA
HAEMO	HAEMOPHILUS
HANT	HANTAVIR

DISEASE_KEY	DISEASE_NAME
LEGIO	L. PNEUMOPHILA
LEGIO	LEGIONELL
LEPT	LEPTOSPIR
LIST	L MONOCYTOGENES
LIST	LISTERI
MALA	MALARIA
MALA	P FALCIPARUM
MALA	P OVALE
MALA	P VIVAX
MEAS	MEASLES
MONK	MONKEY
MONK	MONKEY POX
MONK	MONKEYPOX
MONK	MPOX
MONK	MPX
MONK	MVP
MUMP	MUMPS
NMEN	MENINGOCOC
NMEN	N MENINGITI
NMEN	NEISSERIA
PERT	PERTUSIS
PERT	WHOOPING COUGH
PLAG	PLAGUE
PLAG	YERSINIA PESTIS
RABI	RABIES
RMSF	RMSF
RMSF	ROCKY MOUNTAIN
RUBE	RUBELLA
SALM	SALMONELL

IDPH
ILLINOIS DEPARTMENT OF PUBLIC HEALTH

Case Logs

Case Logs: Condition Listed on DC

IVRS Logs: 2023-06-08 IVRS Match - Date of Death: 2023-06-03 June 8, 2023 8:02:56 AM, IVRSIMPORT: Invalid value for Pregnancy 7 June 8, 2023 8:02:56 AM, IVRSIMPORT: Imported from IVRS :CRVN2023048000;Disease/Condition at Death: IVRS Disease Match

Back To Top

Case Logs: Condition NOT Listed on DC

Investigation status changed to 'Closed'.

IVRS Logs: 2020-05-21 IVRS Match - Date of Death: 2020-05-14

Back To Top

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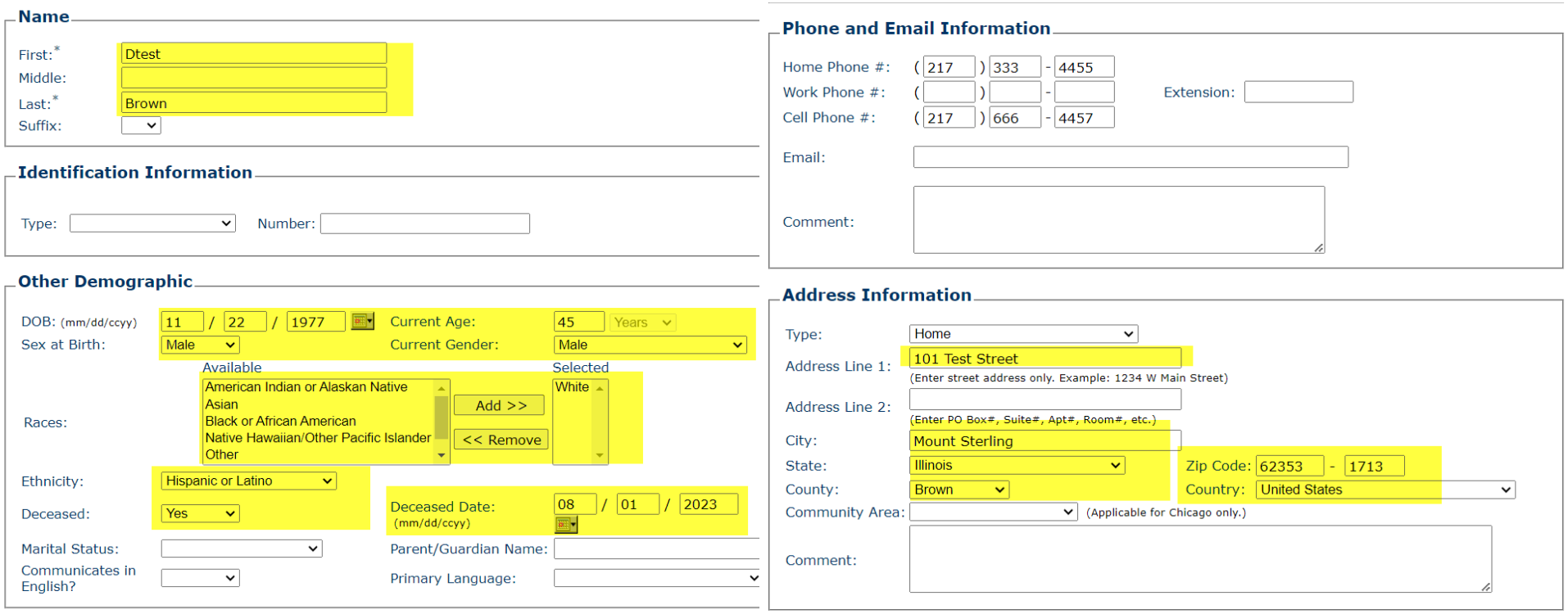
I-NEDSS

Information ingested from death certificates that aid in case investigation:

- Deceased Date
- Demographics
- Place of Death
- Cause of Death
- Underlying Conditions
- Certifier
- Autopsy
- Informant

IDPH
Illinois Department of Public Health

Demographic Page



= Information found on the DC

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Updated IVRS Data to Demographic Page with Disease-Specific IVRS Match

Place of Death:

Autopsy:

Informant:

Certifier:

Birth Place:

Back To Top

Springfield in Sangamon County
INSTITUTION: Inpatient - Memorial Medical Center

Was an autopsy performed? N
Were autopsy findings used to complete cause of death? X

Name and Address

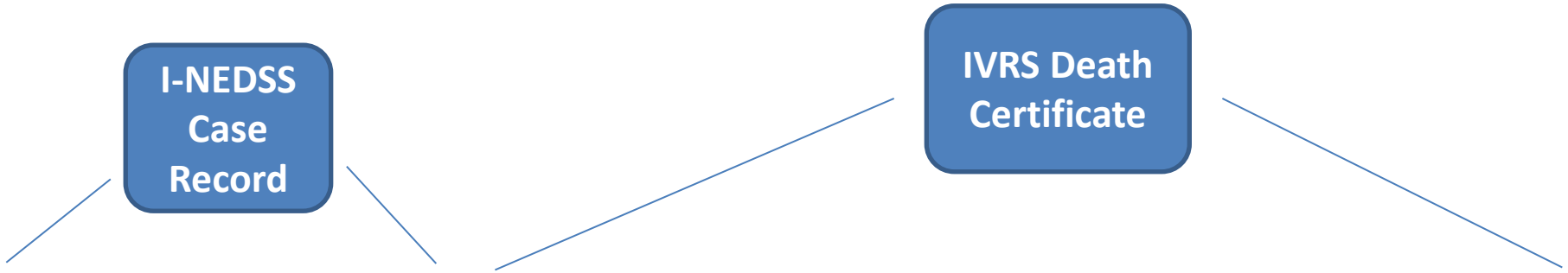
Relationship: Wife

Shravana Aryal
751 North Rutledge Street
Springfield, Illinois 62702
TYPE:Physician In Charge

United States

IDPH
Illinois Department of Public Health

Reports



State Case Number	Deceased	Deceased Date	Immediate Cause of Death	Consq1	Consq2	Consq3	Othsignfconds
29-1793975	Yes	07/02/2022	HYPERCAPNIA RESPIRATORY FAILURE	PROBABLE GUILLAIN BARRE SYNDROME	HAEMOPHILUS MENINGITIS		MORBID OBESITY

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Marking Deaths in Surveillance System

- A deceased match (either person or condition) does not automatically mark the case as a condition-related death
- A secondary question within the surveillance system must be answered manually in order for the case to be counted as a death related to that specific case/condition

Person Account – Demographic Page

Marital Status:	
Deceased:	Yes
Deceased Date:	07/02/2022
Parent/Guardian Name:	
Communicates in English?	

Case Details – General Illness Page

Is the patient pregnant?	
Estimated Due Date:	
Estimated Due Date was calculated based on:	
If the patient died, did the patient die from this illness or complications from this illness?	Yes
Age at Onset:	69 year(s)

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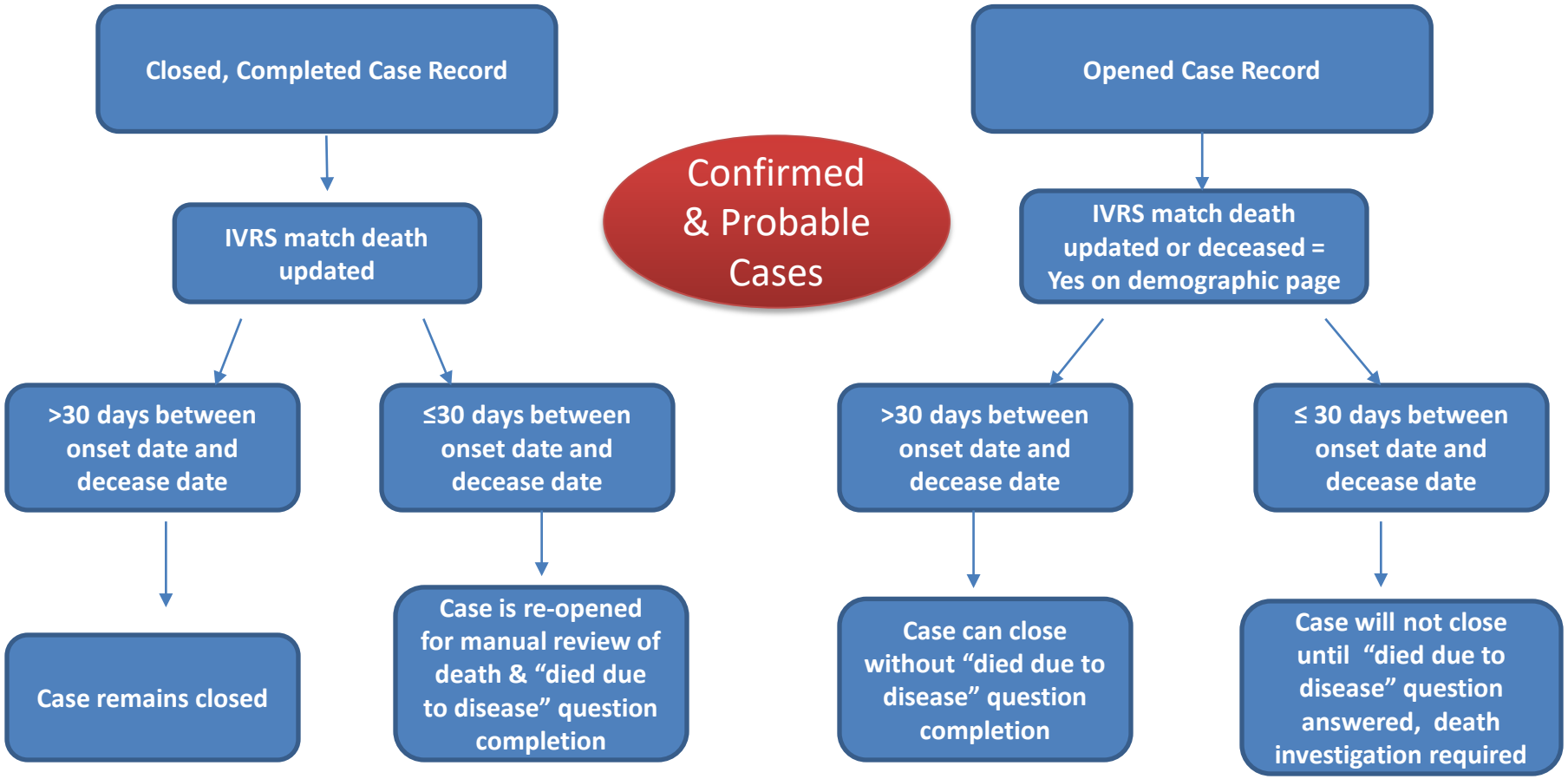
Business Rules



Exceptions to Business Rule:

- Hepatitis A, and streptococcal disease, invasive, group A have an extended rule of 60 days from onset.
- Hepatitis C, hepatitis B, COVID-19 and tuberculosis exempt from this rule

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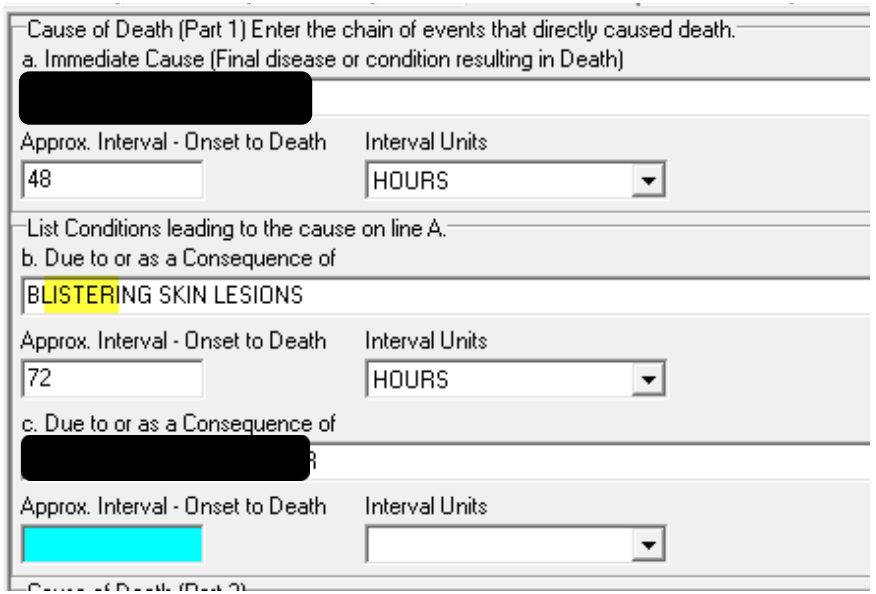
Issues/Needed Improvements

- If DC is reported >30 days, a match will not occur
- Some keywords or terms missing from our list that would identify a death
- Some keywords or terms too “inclusive” for the wildcard matching and can pull in other, unrelated conditions from DC (see example)
- FN, LN, DOB, gender match will sometimes match to the wrong person with that same matching criteria (especially for common names)

B	C
DISEASE_KEY	DISEASE_NAME
LEPT	LEPTOSPIR
LIST	LISTERI
MALA	MALARIA
MEAS	MEASLES
NMEN	MENINGOCOC



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Positive Outcome/Successes

- Automating the ingestion of vital records death certificate data and the implementation of business rules that notify and require further investigation of the cause of death increase the timeliness and completeness of our infectious disease mortality data in Illinois.
- Aided in the timely and accurate mortality reporting of our COVID-19 deaths during the pandemic

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Illinois Department of Public Health

Acknowledgements

- Megan T. Patel, MPH, CD Informatics Lead
- Douglas Tucker, BS, I-NEDSS Database Administrator
- Kevin McGee, IVRS Database Administrator
- Lori Saathoff-Huber, CD Epidemiologist
- IDPH Communicable Disease Investigators

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QUESTIONS / COMMENTS?

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Examining Feasibility of FHIR to exchange Data between State and Local Public Health: A Pilot Study

Sarah Solarz, MPH

September 21, 2023

Project Background

- FHIR (Fast Healthcare Interoperability Resources), a next-generation interoperability standard for efficient exchange of healthcare data has gained momentum in adoption in clinical sector
- Ongoing challenges in interoperability persist in public health despite the immense progress made over the last several years
- Initiatives such as the Helios FHIR Accelerator for Public Health have been launched to promote adoption in public health
- The Minnesota Department of Health (MDH) is participating in the Public health FHIR Implementation Collaborative (PHFIC) as a pilot site for the implementation of a FHIR use case benefiting a state and local public health agency

Methods

- Sponsored pilot project through the Public Health FHIR Implementation Collaborative (PHFIC), facilitated and managed by MITRE
- MDH Office of Data Strategy and Interoperability (DSI) initiated the pilot project, and Hennepin county was recruited as the local public health agency partner based on interests and capacity
- A project team was formed comprised of staff from DSI, MNIT, MEDSS Operations, STI program, lead staff at Hennepin county and supporting staff from MITRE
- A structured method, led by MITRE, was used to identify a feasible data exchange use case for FHIR
- After identifying the use case, the project started a pilot implementation
- FHIR Education was a component of the project throughout

Project Anticipated Value

- Building FHIR skills and knowledge within state and local public health (program staff & IT)
- Relationship building between state and local public health
- Identify future use cases
- Identify staff skills needed and the process
- Provide feedback on future FHIR development
- Expand FHIR capacity at MDH beyond the already started project in the Office of Vital Records

Use Case Selection Process

Decision to focus on data from MDH to Hennepin

- Following the centralized reporting process in MN
- The need for MDH to share data with LPH was already a MDH interoperability priority

Three Use cases was evaluated further

- Infectious disease data for case management
- Vital records
- Immunization data
- All 3 would cover datasets already available to Hennepin County, so no new data use agreements needed

Selected the use case of infectious disease data

- Hennepin county identified the infectious disease data as their highest need.
- Hennepin already had an automated process to receive Immunization data
- MDH had a different active FHIR project for death records.

Narrowed it down to Syphilis case data

- Would replace a manual process where this data was extracted manually out of the MEDSS system

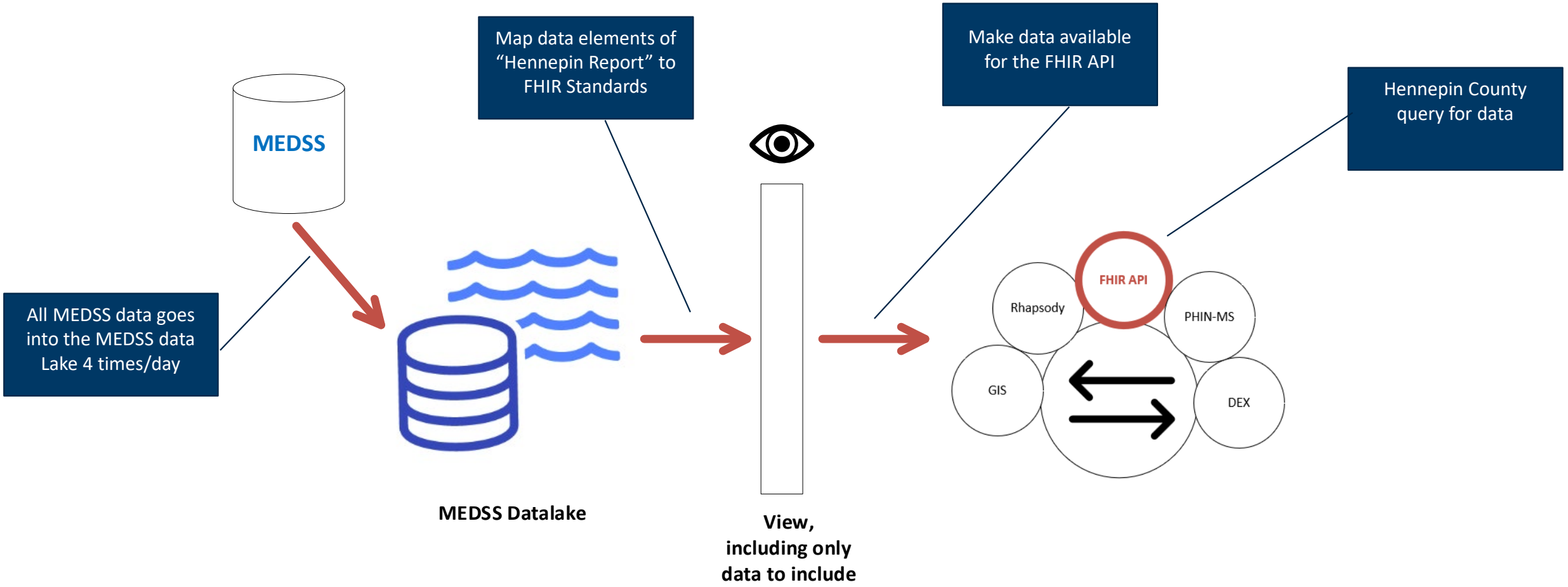
Use Case Selected

- Piloting FHIR for syphilis data from MEDSS to Hennepin County Public Health to support case investigation and follow-up
  - MEDSS: Minnesota Electronic Disease Surveillance System (Maven)
  - Hennepin County, includes the city of Minneapolis, has the 22% of Minnesota's population
  - New infections continued to be centered within the Twin Cities metropolitan area
  - Syphilis cases increased 33% with 1,457 cases in 2021 compared to 1,093 in 2020

Minnesota Electronic Disease Surveillance System (MEDSS)

- Integrated information system to support public health disease surveillance in Minnesota
- Person-centric system and consolidates data receives from various sources for an individual
- Supports case management, contact tracing and outbreak investigations
- Receives lab data on reportable conditions; mostly as electronic laboratory reporting (ELR)
- Receives paper/manual case reports currently; moving towards electronic case reporting (eCR)

Data Process Flow



Cross-Disciplinary Team

Every step of the process required different skills and people

Communication and Coordination is key

- **MDH DSI—project manager, contract manager, finance resources**
- **MDH Syphilis program staff—data set, filtering logic**
- **MDH MEDSS Operations staff—data mapping, filtering logic specifications, testing, documentation, data lake review**
- **MNIT Teams—overall design, data lake views and filtering, FHIR API, User access controls**
- **Hennepin County—program and technical staff to be able to receive syphilis data**
- **MITRE—Technical Assistance (TA) resource, provide FHIR training, consultation, etc.**

Lessons Learned

- Mapping the process, design, and data use by partners before the project is beneficial
  - Inclusive of the data filtering logic and data translation/transformations at each point of the design
- Finding the right people post-COVID can take time
- Staff bandwidth is less right now, so communication and documentation is even more important as parts of the process exchange hands
- Need to include someone to know both the FHIR standard and the data to be able to map it correctly (we should have engaged this person earlier)
- Competing priorities for key IT staff with FHIR standard skills to support this project
- Coordination needed between the FHIR project for the Office of Vital Records

Factors for FHIR Future

- Staff: skills, availability, burnout, turnover, well-being, setting expectations
- Aligns with Data Vision and Roadmap Project and other initiatives
- Asks of partners and/or community
- Strong connection to health equity
- Evaluate the implications sharing a single data set multiple ways
- Avoid creating technological and data disparities between partners
- Focus on data sets/programs with processes not going well or clunky (QI focus)
- Preference/focus of new health commissioner and other leadership roles

Next Steps

Phase 2: bi-directional FHIR exchange with Hennepin County for syphilis case data

Evaluate our Phase 1 Minimum Viable Product, document lessons learned for future FHIR implementations, and make enhancements to infrastructure/design to make it scalable and reproducible

Thank You!

Sarah Solarz

Minnesota Electronic Disease Surveillance System (MEDSS) Manager, DMI co-lead

Minnesota Department of Health

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HENNEPIN COUNTY

MINNESOTA

Public Health

Public health context

- In Hennepin County, syphilis cases increased by 31% (646 vs. 846 cases) between 2021 and 2022.
- Between January and September 2022, 52 cases of syphilis were diagnosed by Health Care for the Homeless, compared to 14 cases between January and September 2021.
- 34% of cases have a history of receiving housing services, 14% of cases have patient history with Health Care for the Homeless.

Data-informed local response

- Case data are utilized to support case follow up.
  - Cross reference against public health patient lists, human services, and homeless information systems.
- Data reporting allow for local surveillance risk and demographic factors (gender, age, race/ethnicity)

Original state

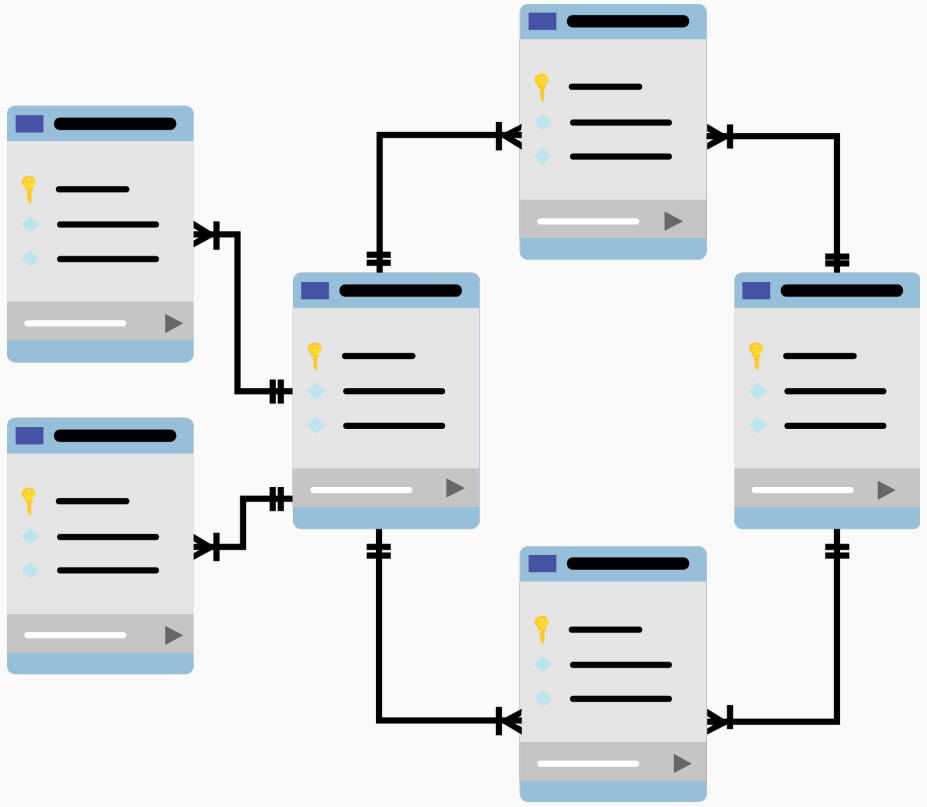
- State health department staff extract, format and upload case data to SFTP drive.
- Hennepin Epi then manually download data
- Monthly file preparation/transfer

Limitations

- Monthly data hinder timely follow up
- Staff time required for data preparation and manipulation
- Human factors can create delays (e.g. vacation, competing priorities)

Public health informatics modernization

- Data engineering unit of Public Health Data & Analytics
- New unit as of March 2022 & fully staffed since June 2022
- Developed Azure data lake with vital statistics, infectious disease surveillance, and other public health data



HENNEPIN COUNTY
PUBLIC HEALTH

Hennepin County Syphilis Report

High sensitivity, please consult before sharing

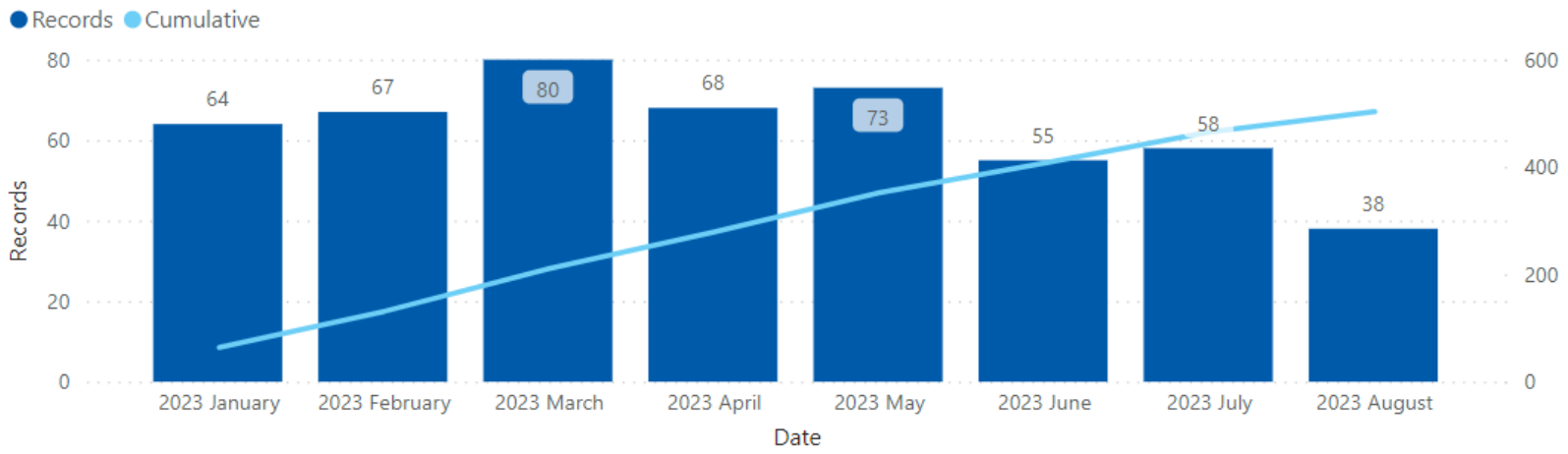
Year
- 2022
- (2023)

503
Records

80
HCH Match

183
HMIS Match

Monthly case count year to date



Count

% Change

Infection
- (Blank)
- primary
- secondary
- early latent
- late latent
- neurosyphilis
- congenital
- other

Race/Ethnicity	Records	%
Hispanic/Latino	75	14.9%
Amer Ind, not Hispanic	60	11.9%
Asian, not Hispanic	15	3.0%
Black/AA, not Hispanic	214	42.5%
Other, not Hispanic	7	1.4%
White, not Hispanic	113	22.5%
Unknown	19	3.8%
Total	**503**	**100.0%**

Gender	Records	%
Female	154	30.6%
Male	347	69.0%
Non-binary	1	0.2%
Unknown	1	0.2%
Total	**503**	**100.0%**

Age Group	Records	%
<10	5	1.0%
15-19	16	3.2%
20-24	48	9.5%
25-29	58	11.5%
30-34	109	21.7%
35-39	66	13.1%
40-44	55	10.9%
45-54	59	11.7%
55+	87	17.3%
Total	**503**	**100.0%**

Anticipated outcomes

- Query state FHIR server for syphilis data based on date range
- Ingest data into public health data lake
- Match data against public health clinical and housing services to examine opportunities to assist with case follow up
- Populate data in Power BI surveillance reports

Progress to-date

- Developed API call function using Databricks
- Small scale testing of API response and assuring data are received accurately and in expected format
- Preparing for User Acceptance Testing and Production Deployment

Next steps

- Move to production and complete user acceptance testing
- Evaluate process improvements
- Phase II: Exploring bi-directional exchange to return information to state health department

Lessons learned

- Local public health data systems require additional investments to enable interoperable data
- Migrating data storage solutions to cloud-based infrastructure created a flexible and responsive ecosystem to nurture this project.
- Staff skill in creating data pipelines has grown through exposure to FHIR data transfer

Dave Johnson

David.johnson2@hennepin.us, 612-348-6150

Data and Reporting Automation

Benjamin Schram MPH

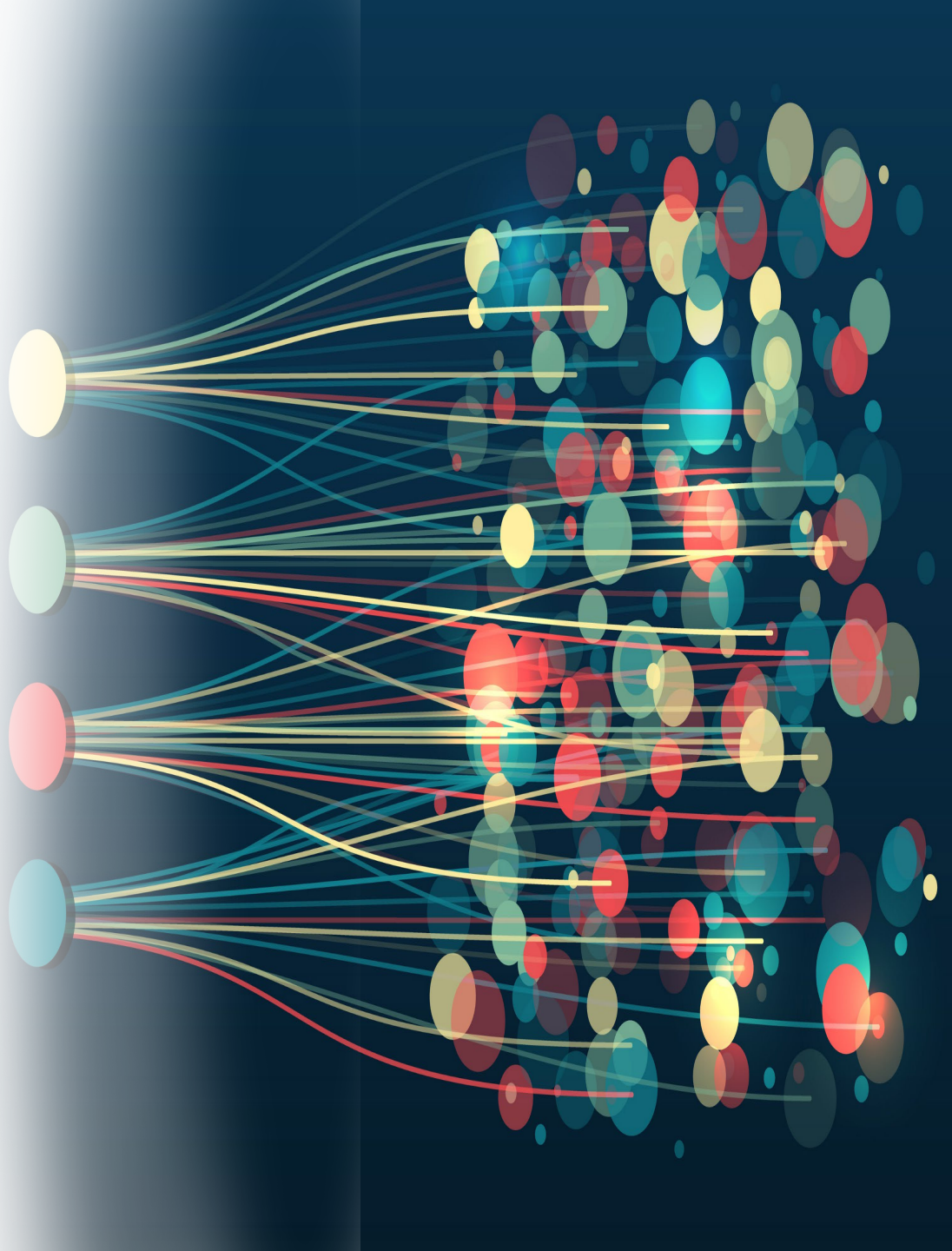
NORTH Dakota | Health & Human Services

Be Legendary.

Where do we get our data?

Who? When? How?

- Disease Surveillance Systems
- Immunization Information Systems
- Education systems
- Hospital systems
- HIE
- Vital Records
- Specialized systems
- Etc.



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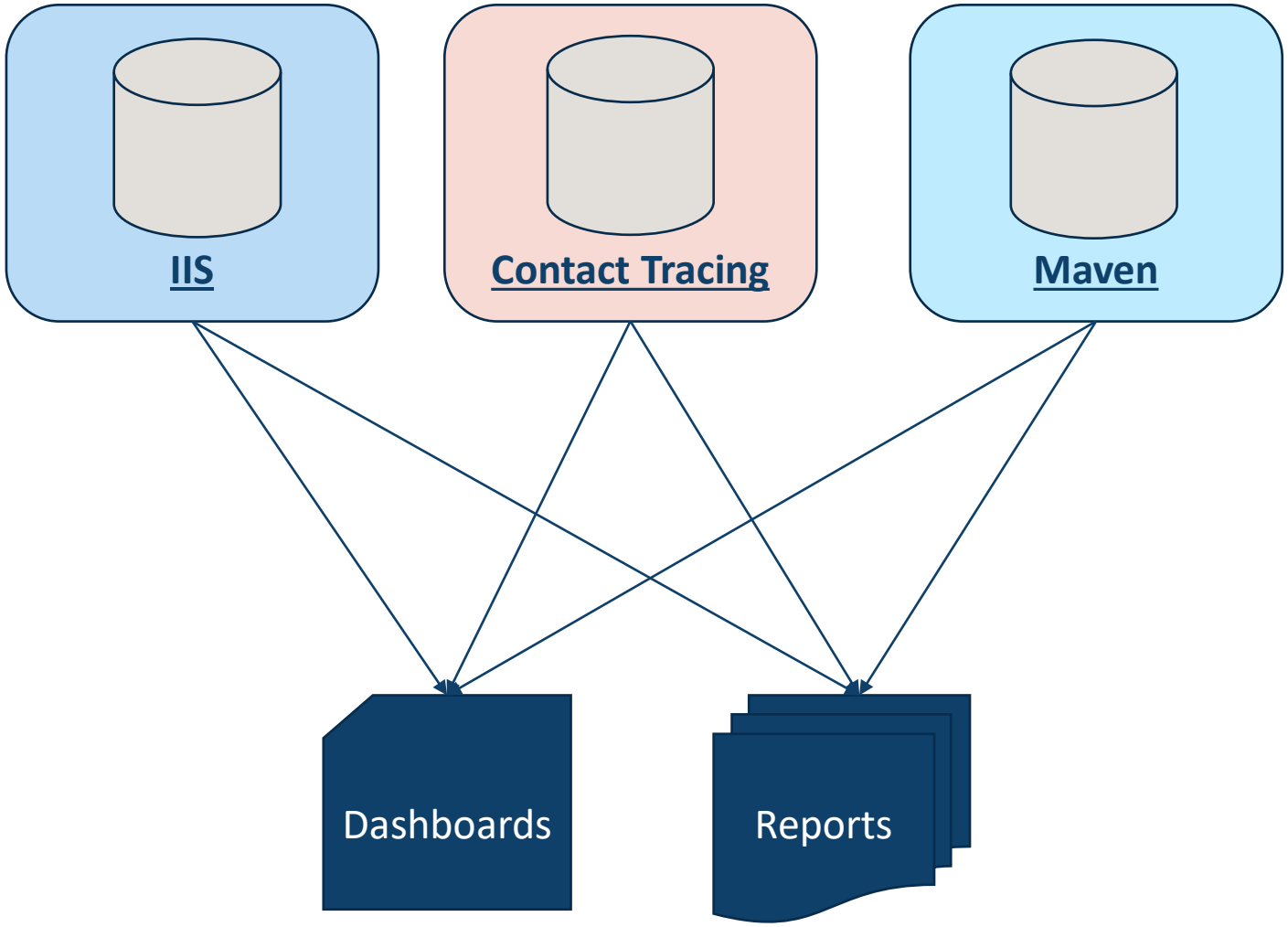
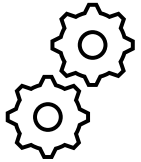
Be Legendary.

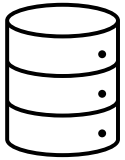

IIS
Contact Tracing
Maven
Dashboards
Reports

Steps in changing our data pipeline

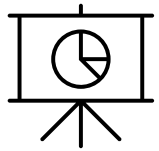
Single Source of Truth



Automatic Processing



Automatic Serving



Automatic Reporting

Single Source of Truth

- “Freeze” data at midnight.
- Extract, clean and prepare datasets and reports.
- This data is the source of truth for all internal and external uses for the following day.

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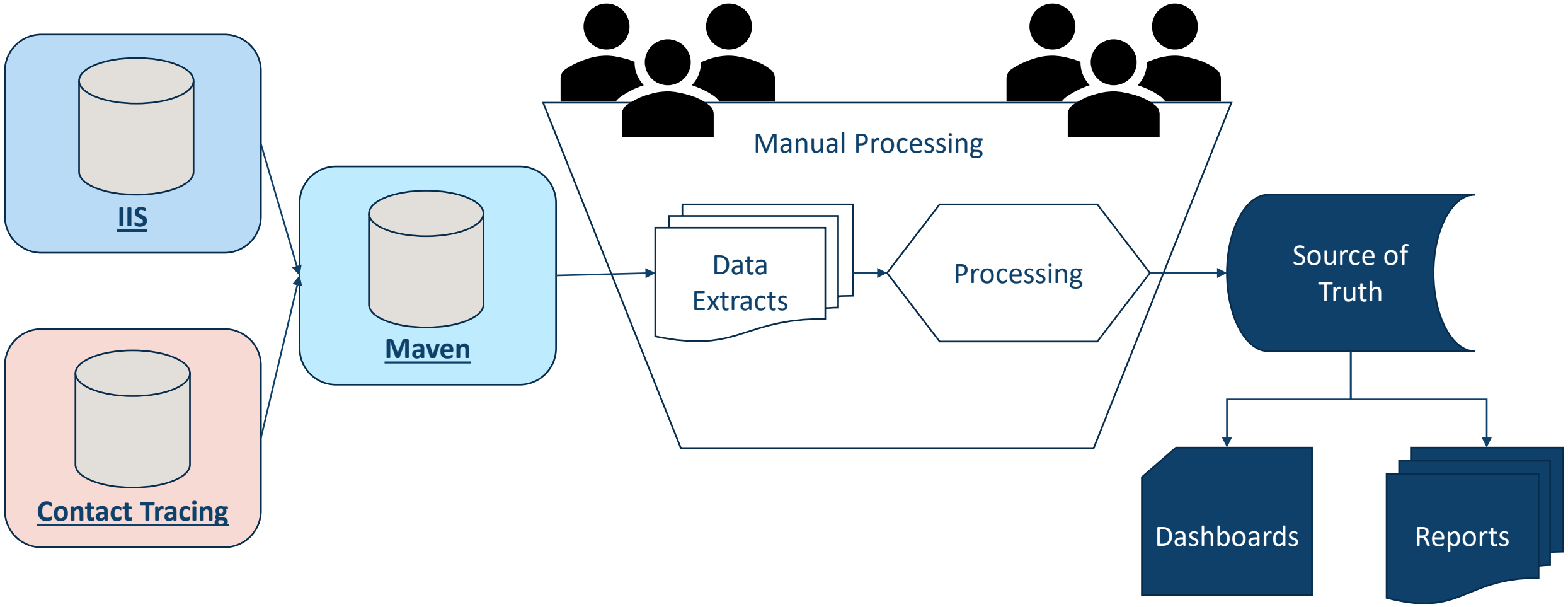
Be Legendary.


IIS
Contact Tracing
Maven
Manual Processing
Data Extracts
Processing
Source of Truth
Dashboards
Reports

Automatically process data

- Data extraction and processing pipeline was built incrementally using Python.
- Replaced manual data cleaning and processing with python scripts.
- Replaced manual data extracts from surveillance system with queries direct to database.

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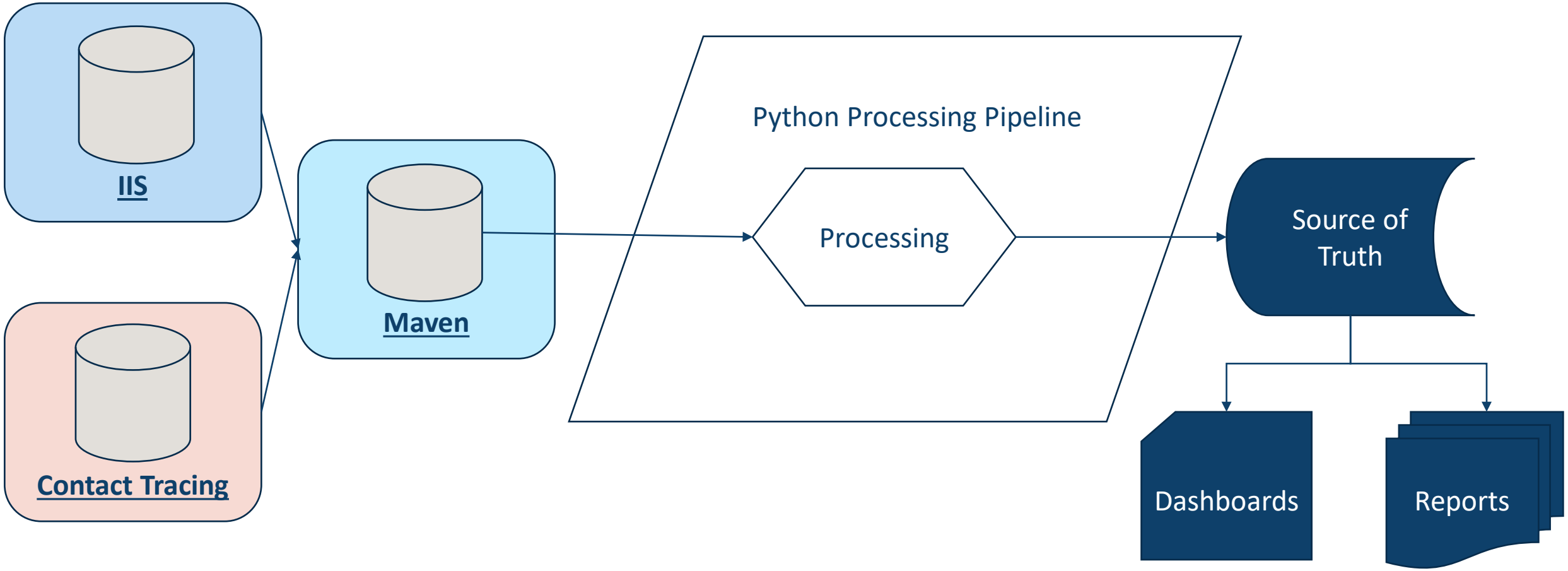
IIS
Contact Tracing
Maven
Python Processing Pipeline
Processing
Source of Truth
Dashboards
Reports

Automatically Store and Serve Data

- Data warehouse built in collaboration with North Dakota Information Technology (NDIT).
- Warehouse stores frozen data at midnight, creates connections between systems, performs cleaning and validation steps, and serves data to end users.

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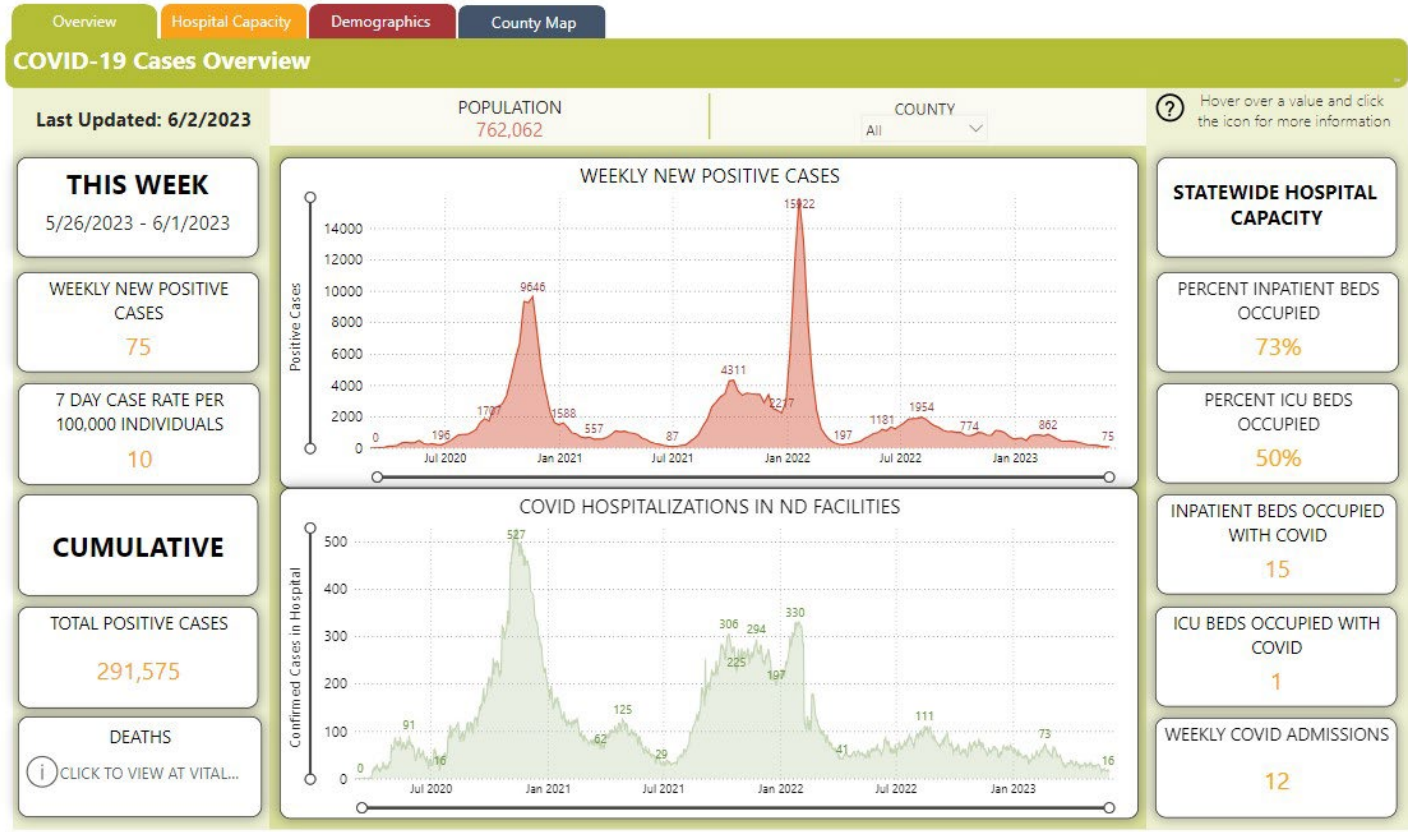
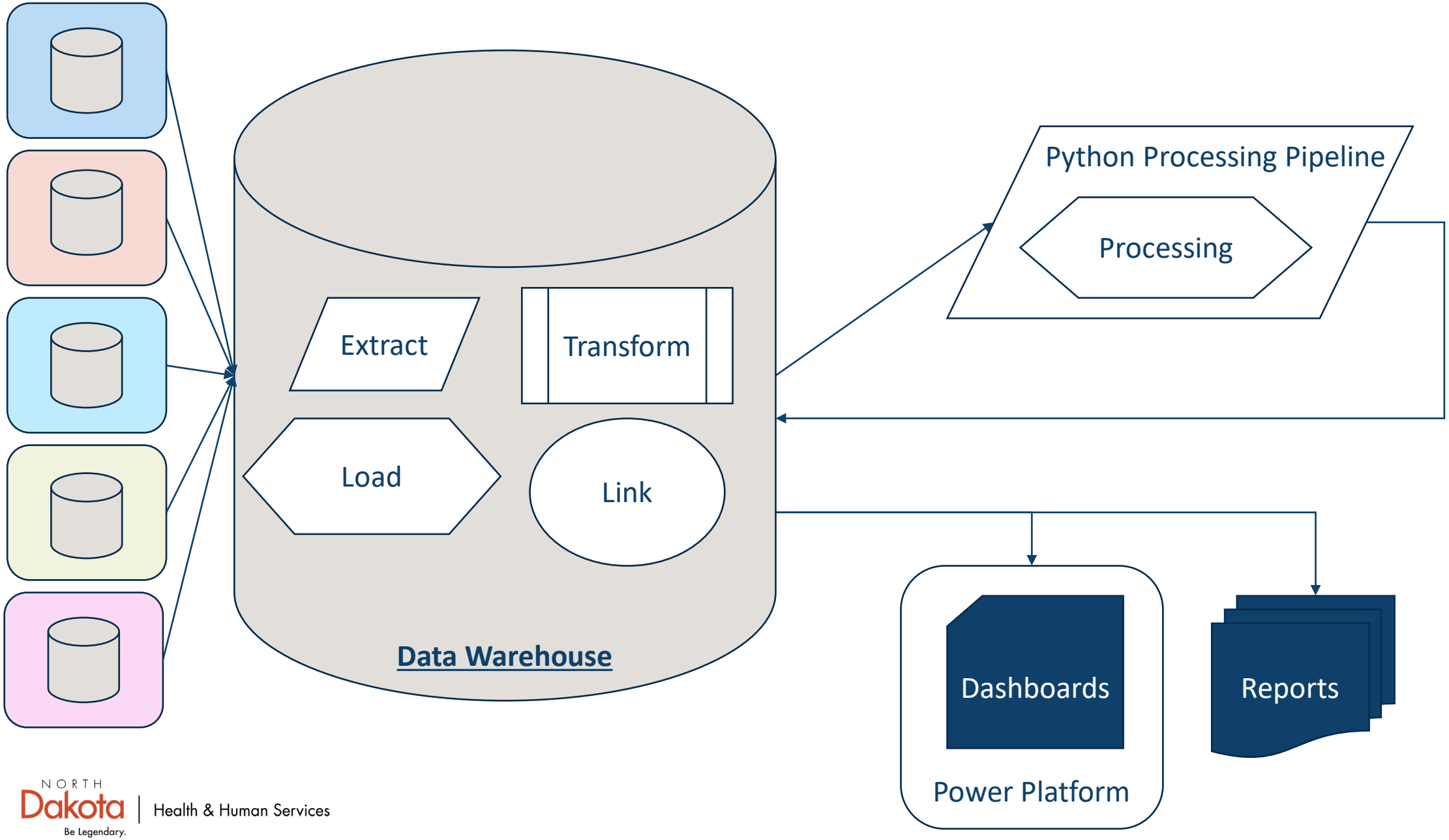
Automatically Report

- Data Warehouse is integrated with Microsoft Power Platform's Dataflows to allow automatic updating of dashboards.
- Data in Data Warehouse is used to build additional reports using Python, R, or a user's preferred language.





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Current State

- When able, we utilize Data Lake / Data Warehousing to store, transform, and serve data.
    - Adding datasets to data lake or warehouse with assistance of Centralized IT Department
- Other combinations of data sources, data transformations, and data serving have been used as intermediate steps.

Thank You!

NORTH Dakota
Be Legendary.
| Health & Human Services

Questions & Answers

Advancing Public Health Interoperability: Vendor Perspectives

Mike Berry (HLN), Theron Jeppson (EpiTrax), and Jim Daniel (Amazon Web Services)

Leveraging FHIR for IIS Bulk Data and Modernization

ONC 2023 Virtual Tech Forum
Modernizing Public Health Data Exchange:
Lessons Learned and Tools for the Road Ahead

September 21, 2023

Background: Immunization Information Systems (IIS)

- Confidential, population-based systems
- Collect and consolidate immunization data in a given jurisdiction
- Provide actionable information for clinical and public health decision making. (Source: CDC)

IIS Background (continued)

- Inbound data exchange:
  - HL7 version 2 Unsolicited Vaccination Update (VXU)
  - Flat file
  - Interactive web applications
- Outbound data exchange:
  - HL7 version 2 Query/Response (QBP/RSP)
  - Flat file (CDC Data Clearinghouse, HEDIS data, etc.)
  - Interactive web applications

FHIR in a Nutshell

- Fast Healthcare Interoperability Resources (FHIR)
- Next generation HL7 standard
- Set of Resources and a modern RESTful API for accessing them
- **FHIR Bulk Data** – FHIR-based approach for exporting large amounts of data from a FHIR server
- **SMART on FHIR** – health app interface based on FHIR and other open standards

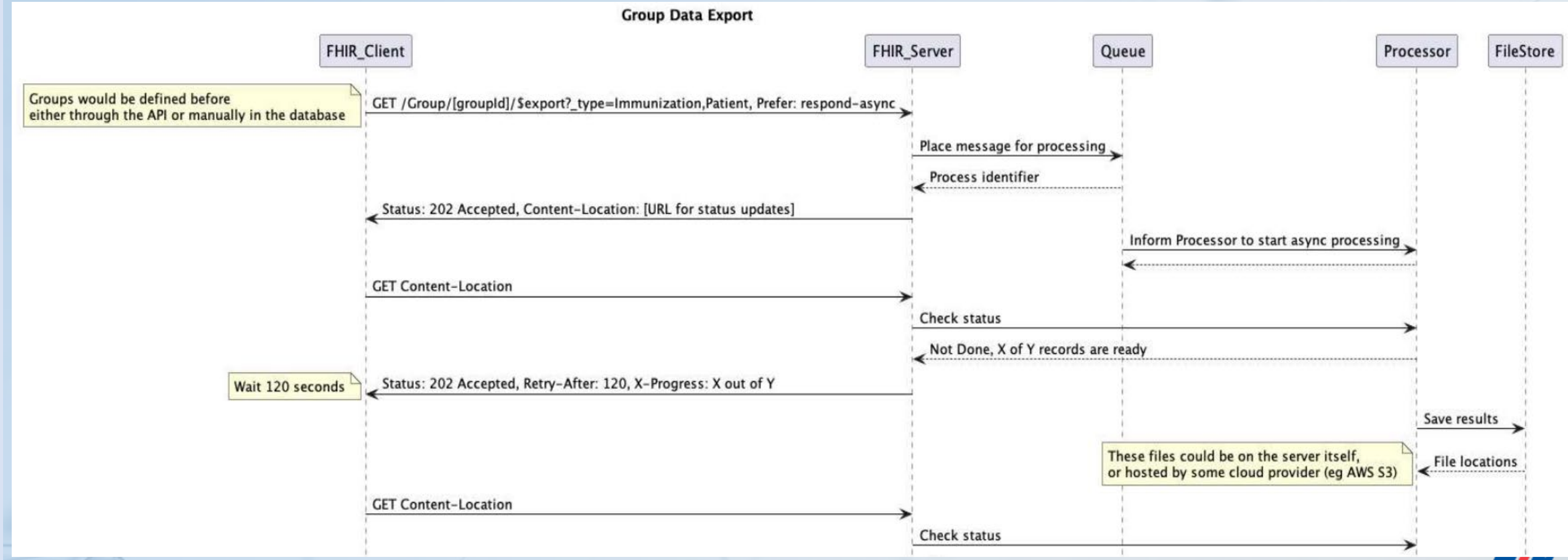
FHIR Server Models

- **FHIR Façade**
  - Data translation – translate FHIR REST calls to the underlying legacy database or service (no native FHIR storage)
  - Intermediate FHIR server – synchronize native FHIR storage to underlying legacy database or service
- **Native FHIR server**
  - FHIR storage is the operational data store

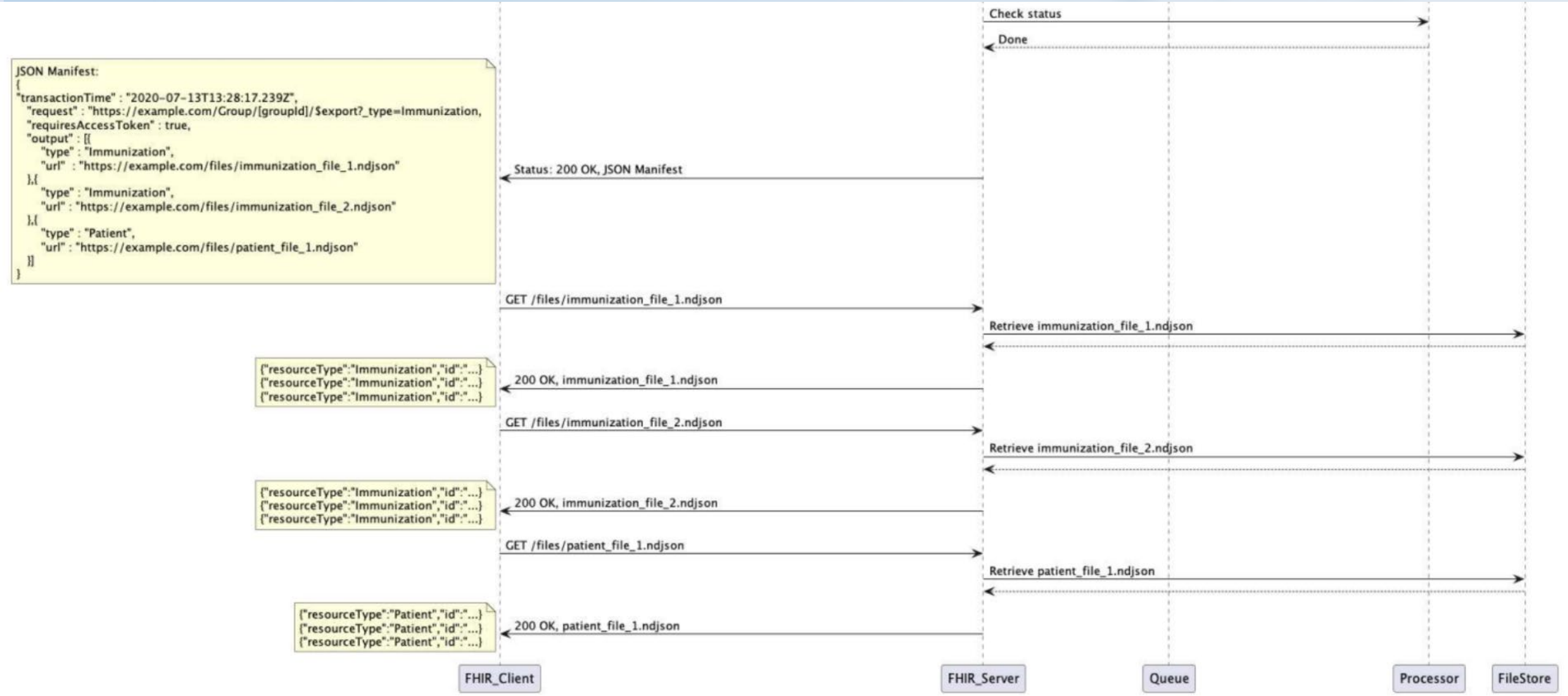
Why FHIR for IIS Data Access?

- Accessible to general purpose developers
- Modern APIs, software, tools, resources, and support
- FHIR Bulk Query:
  - Efficiently access up-to-date immunization data
  - Reduce redundant queries
  - Easy to parse bulk data format
  - Flexibility for different use cases: Hospitals, physicians, schools, payers, etc.
  - Modern authentication/authorization framework

Bulk FHIR Workflow for IIS



Bulk FHIR Workflow for IIS (continued)



Immunization FHIR Example

Patient Info

First Name: **TEST** Middle: **A** Last: **HIMSS-PATIENT**

Date of Birth: **04/20/2022** Age: **10m 16d**

VALID DOSES					NEXT DUE
COVID-19 2 valid doses	10/20/2022 COV19 PF PFR 6m-5 6m 0d	11/20/2022 COV19 PF PFR 6m-5 7m 0d			**Due Now** (On or after 01/15/2023) Dose 3 Covid Record
Influenza					**Due Now** (On or after 10/20/2022) Dose 1
Hepatitis B 3 valid doses	04/20/2022 HepB ped/adol 0m 0d	06/20/2022 VAXELIS 2m 0d	08/20/2022 VAXELIS 4m 0d [1]	10/20/2022 VAXELIS 6m 0d	**End of Series**
DTaP/DT/Tdap/Td 3 valid doses	06/20/2022 VAXELIS 2m 0d	08/20/2022 VAXELIS 4m 0d	10/20/2022 VAXELIS 6m 0d		**Due in the Future** (07/20/2023 - 12/17/2023) Dose 4
Pneumo 1 valid doses	06/20/2022 PCV15 2m 0d				**Past Due**
Polio 3 valid doses	06/20/2022 VAXELIS 2m 0d	08/20/2022 VAXELIS 4m 0d	10/20/2022 VAXELIS 6m 0d		**Due in the Future** (04/20/2026 - 05/17/2029) Dose 4
Hib 3 valid doses	06/20/2022 VAXELIS 2m 0d	08/20/2022 VAXELIS 4m 0d	10/20/2022 VAXELIS 6m 0d		**Due in the Future** (04/20/2023 - 09/16/2023) Dose 4
Rotavirus 0 valid doses					Maximum Age Reached

*Courtesy of the Rhode Island IIS

Rhode Island IIS Implementation

- Rhode Island Child and Adult Immunization Registry (RICAIR)
- FHIR Façade Model (with translation layer) using open source HAPI FHIR server and SMART Backend Services Authorization
- Bulk Query:
  - Predefined Groups, or search and define custom groups
  - Query Patient, Immunization, ImmunizationRecommendation, and ImmunizationEvaluation resources
  - Download up to 100k patients or more in a fraction of the time of HL7 v2 QBP/RSP
  - Server has flexibility in scheduling and allocating resources to query

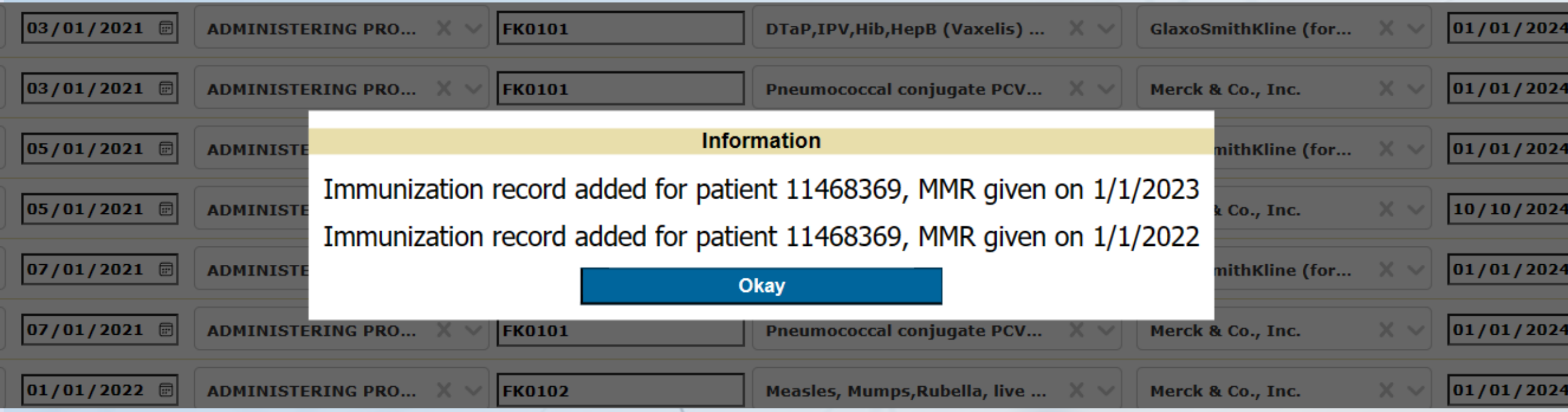
Helios FHIR Accelerator for Public Health

- Part of the **Immunization Integration Program (IIP)** Workgroup – collaborative to improve EHR/IIS interoperability
  - Convening Partners: CDC, AIRA, HIMSS, Drummond & SME Consultants
- **IIS Bulk Data Query - Make Data in Public Health Systems Accessible in Bulk**
  - Leverage bulk FHIR to develop a uniform process for querying IIS data
  - Develop Implementation Guidance & vision for bulk data exchange
  - Test & pilot solutions

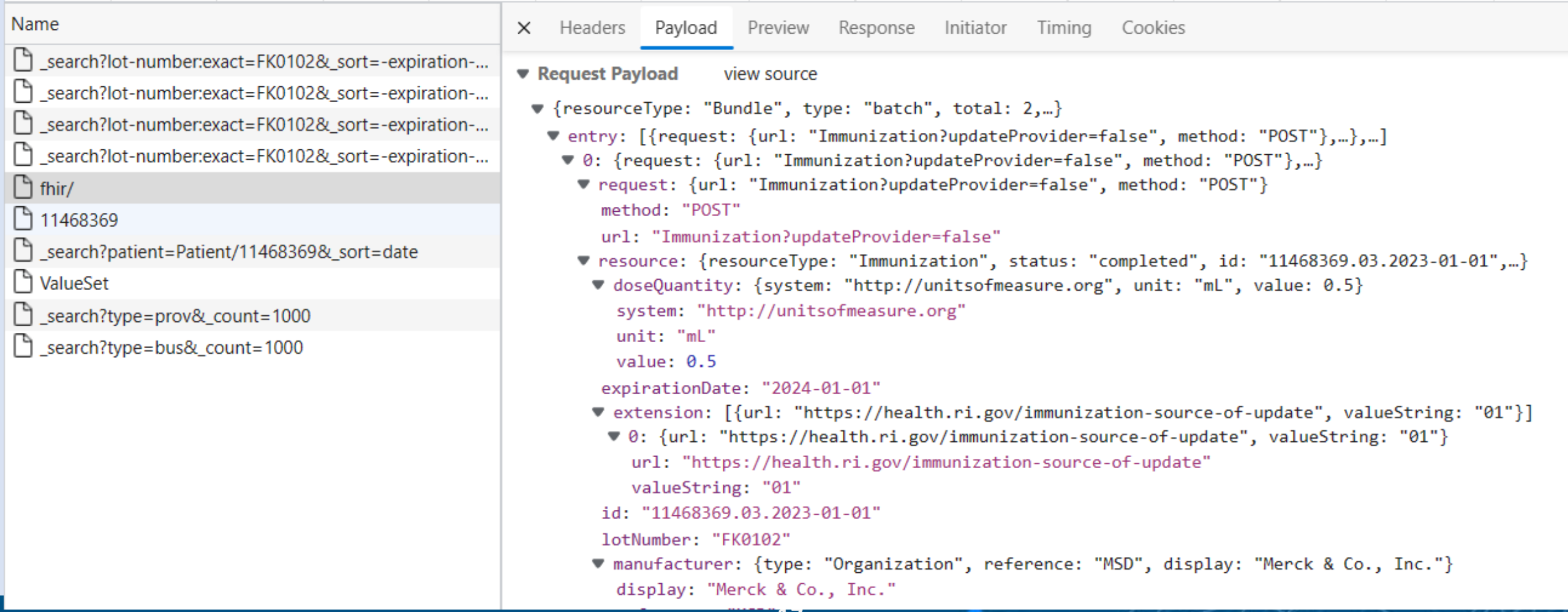
RI IIS Bulk FHIR – Helios Status

Functionality	FHIR functionality	Status
Bulk Data Export	Group/[id]/$export	Tested at January Connectathon; US Core Support enhanced for June Helios virtual event; Available for use - Soliciting potential partners
Patient Match	Patient/$match	Tested at June Helios virtual event
Creation of Group resource	POST /Group {“member” […] }	Tested at June Helios virtual event
Add Patient to Group	Group/[id]/$member-add	Tested at June Helios virtual event
Remove Patient from Group	Group/[id]/$member-remove	Tested at June Helios virtual event
Security/authentication – SMART Backend Services (OAuth/JWT)	/.well-known/smart-configuration POST /auth/token	Tested at June Helios virtual event
Bulk Match (Argonaut)	Patient/$match with [1..*]	Prototype implementation ready for testing at next Connectathon

Now that we have a FHIR server, what else can we do with it?



IIS Web App – FHIR behind the scenes



Leveraging FHIR Bulk Data for DMI

- FHIR Server for IIS can double as an application modernization strategy
- Replace legacy web applications with modern front-ends that communicate with the FHIR back-end:
  - Immunization Data Entry/Update
  - Other potential uses:
    - Immunization Display, Patient Demographics, SMART Health Cards, School Forms, etc.
    - SMART on FHIR apps
    - Consumer apps
    - IIS-to-IIS - IZ Gateway

Thank you!

- Acknowledgements:
  - Rhode Island Child and Adult Immunization Registry (RICAIR) and CDC
  - Helios – The HL7 FHIR Accelerator for Public Health
  - Immunization Integration Program (IIP)
  - American Immunization Registry Association (AIRA)
  - HLN Rhode Island Team

- Questions? Mike Berry (berrym@hln.com)

Public Health Case Surveillance Modernization

Theron Jeppson, M.Ed
Division of Population Health
Informatics Assistant Program Manager
September 21, 2023

Utah Department of Health & Human Services

MMWR
Morbidity and Mortality Weekly Report
www.cdc.gov/mmwr

MMWR Dispatch
Vol. 58 / April 21, 2009

Swine Influenza A (H1N1) Infection in Two Children — Southern California, March–April 2009

On April 17, 2009, CDC determined that two cases of febrile respiratory illness occurring in children who resided in adjacent counties in southern California were caused by infection with a swine influenza A (H1N1) virus. The viruses from the two cases are closely related genetically, resistant to amantadine and rimantadine, and contain a unique combination of gene segments that previously has not been reported among swine or human influenza viruses in the United States or elsewhere. Neither child had contact with pigs; the source of the infection is unknown. Investigations to identify the source of infection

outpatient clinic, and a nasopharyngeal swab was collected for testing as part of a clinical study. The boy received symptomatic treatment, and all his symptoms resolved uneventfully within approximately 1 week. The child had not received influenza vaccine during this influenza season. Initial testing at the clinic using an investigational diagnostic device identified an influenza A virus, but the test was negative for human influenza subtypes H1N1, H3N2, and H5N1. The San Diego County Health Department was notified, and per protocol, the specimen was sent for further confirmatory testing to reference labo-

April 21, 2009

Integrated Disease Surveillance Systems

Cornerstone for modern and robust public health case surveillance activities.

- Balance between structure and flexibility
- Invest in partnerships
- Enhance core infrastructure
- No throwaway systems
- Financial sustainability

Guiding Principles

Public health reporting is a burden - we know

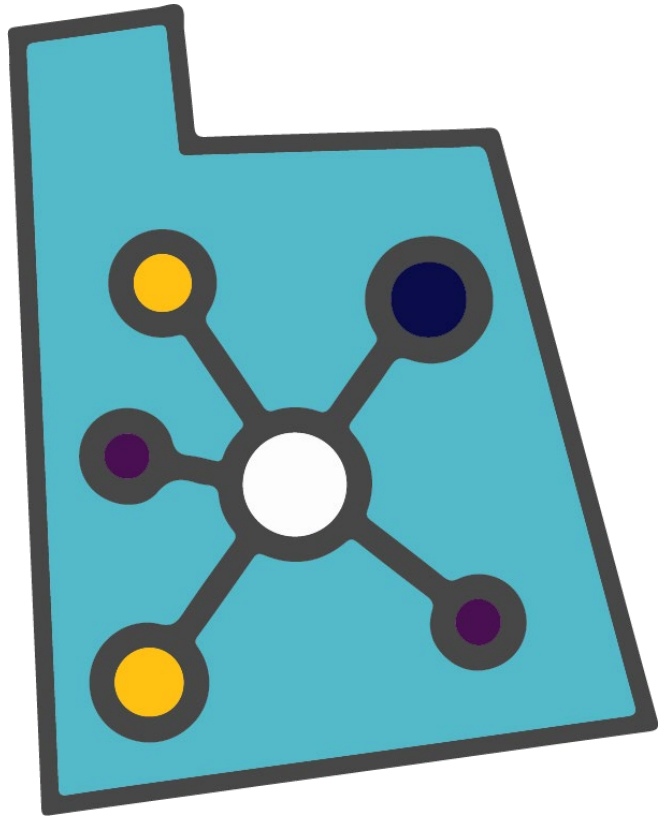
- Centralize reporting within the state
- Work with imperfect implementations of standards
- Automation, automation, automation

Clinical Interoperability

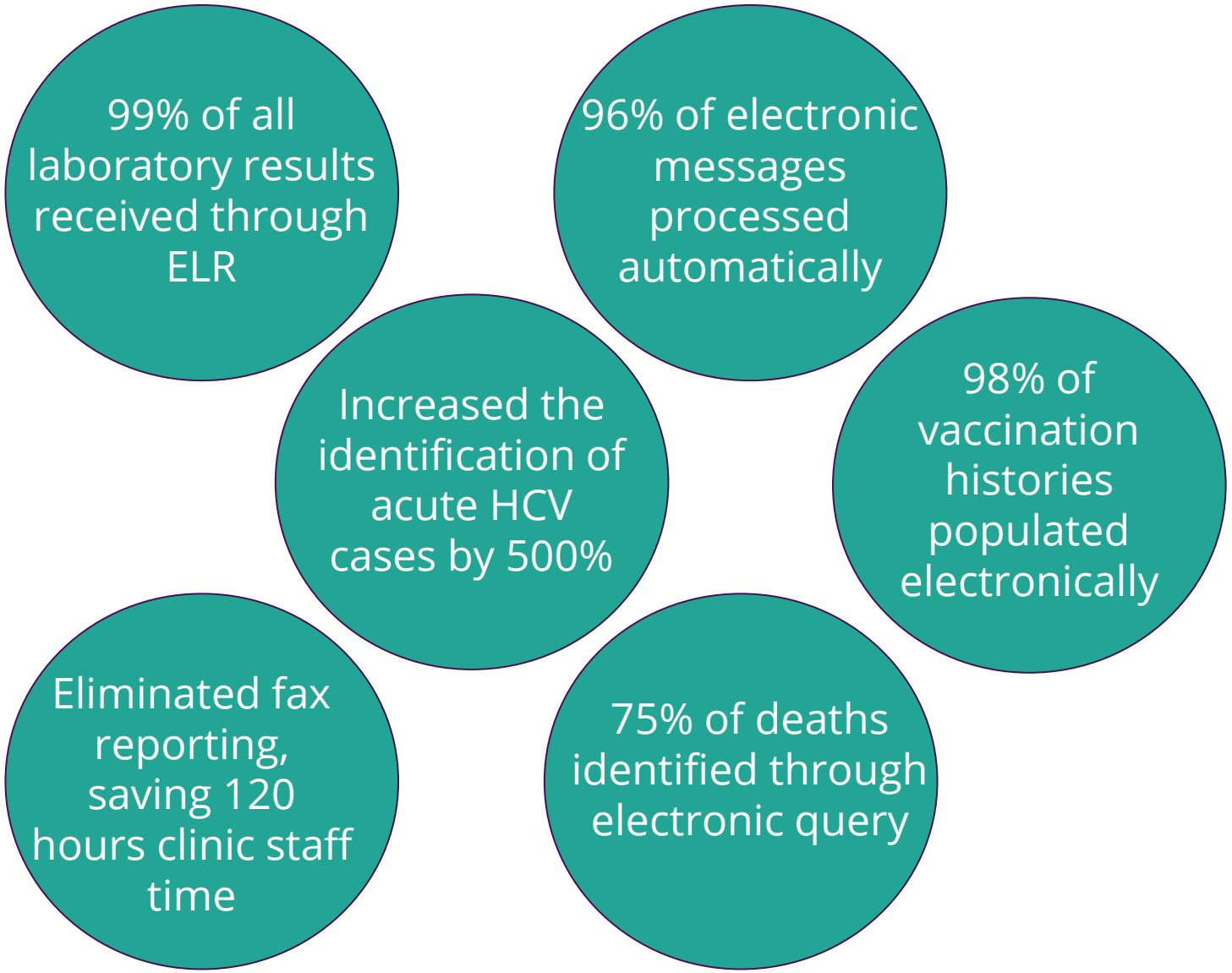
Integrate systems internally

FHIR-based interoperability

- Electronic Death Registry System
- Immunization Information System

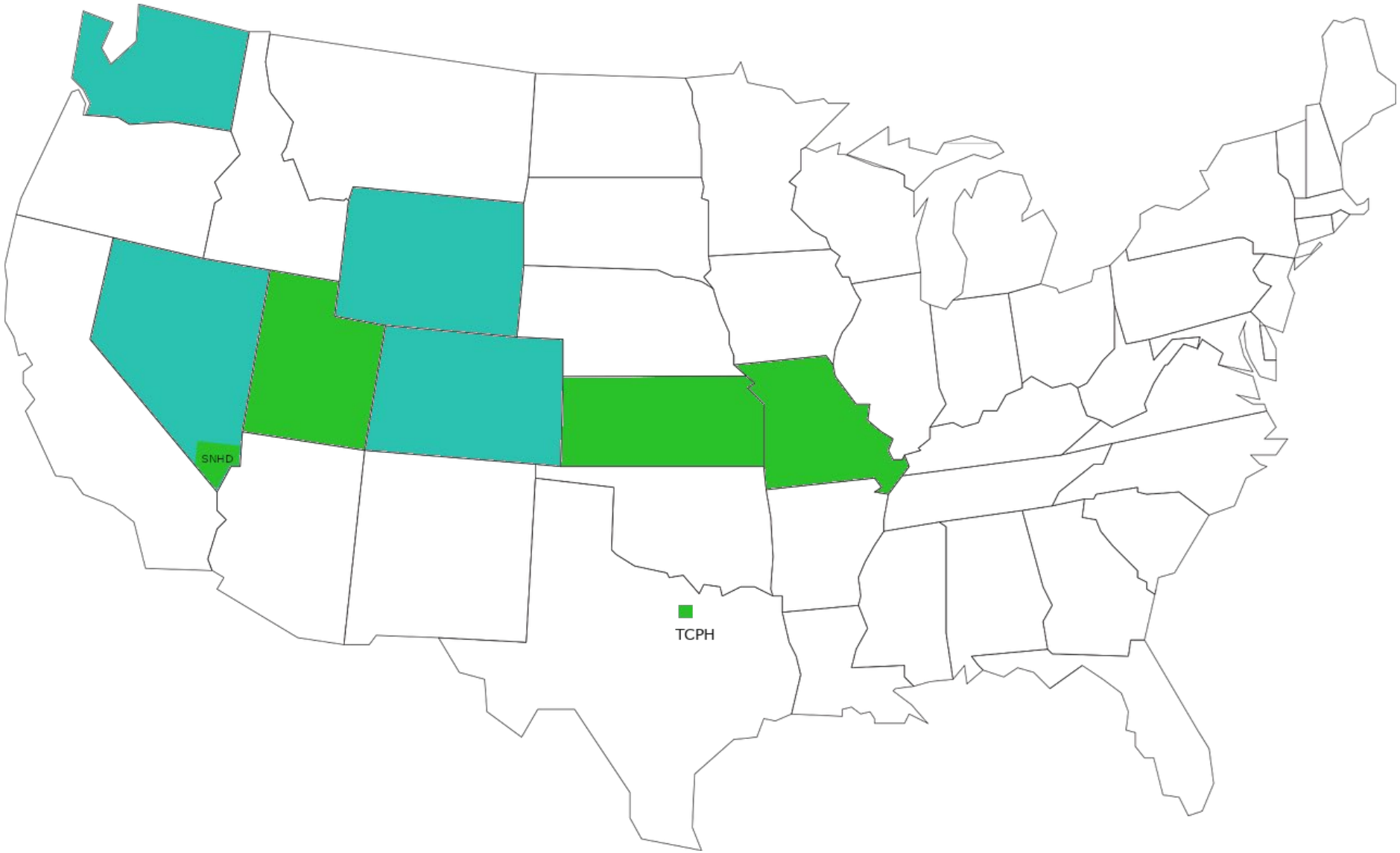


Public Health Integration



- Saved everyone time
- Improved quality
  - Timeliness
  - Completeness
  - Accuracy
- Increased access to data
- Novel surveillance processes

Current Impact



EpiTrax Implementations

EpiTrax Community Consortium

Created in 2015 to enable the collaboration of health jurisdictions utilizing the EpiTrax suite of applications.

Key goal is to share resources for:

- Design
- Feature development
- Implementation
- Maintenance

Responsibilities:

- No financial obligations
- No requirement to contribute
- Jurisdictions are responsible for their own hosting and data security

EpiTrax Consortium

Public health jurisdictions have complete decision-making power

Release Manager

- Full authority to represent the jurisdiction
- Formal end user feedback process

Contributor

- Propose enhancements and new features
- Submit bug reports
- Contribute to code development and application documentation

Code Steward

- Utah Department of Health and Human Services
- Manage Consortium branches and releases
- Facilitates formal Consortium activities

Consortium Governance

Priorities Moving Forward

- Universal solutions
- Interoperability grounded in standards
- Focus on quality
- Success in real-world implementations

Future

AWS Public Health Team

Jim Daniel, MPH
Public Health Leader

Betsy Baker, MPH
Modernization Lead

Dawn Heisey-Grove, MPH PhD
Public Health Analytics Leader

Venkata Kampana
Senior Solution Architect

Strategy Development

Working Backwards Sessions

aws migrations

Strategic Data Modernization Planning with Maryland Department of Health

“We quickly realized the limitations of our small team and we had to encourage team members to get out of our resource-constrained mindsets and allow ourselves to think big with no limits—not worrying about funding or how we would get from the current state to the future state.”—Dr. Katherine Feldman, Chief Scientist, Maryland Department of Health

Working Backwards in Iowa to Design a Disease Surveillance System for the 21st Century

"We could go to an organization and say, we want to build this. But the problem is that group—while happy to help us build something—isn't coming in with a public health perspective. That's why we were happy to find the AWS public health team, because they have the real public health experience and expertise. They've been there."

"Out of the gate, we felt a great deal of comfort that we made the right decision [to work with AWS] because they speak our language and understand what we're dealing with."

–Jeff Van Engelenhoven, CIO
Iowa Department of Health and Human Services

Proof of Concept Tenets

Test mission use cases and accelerate value

Understand AWS services and solutions

Create “sandbox” environments for iteration

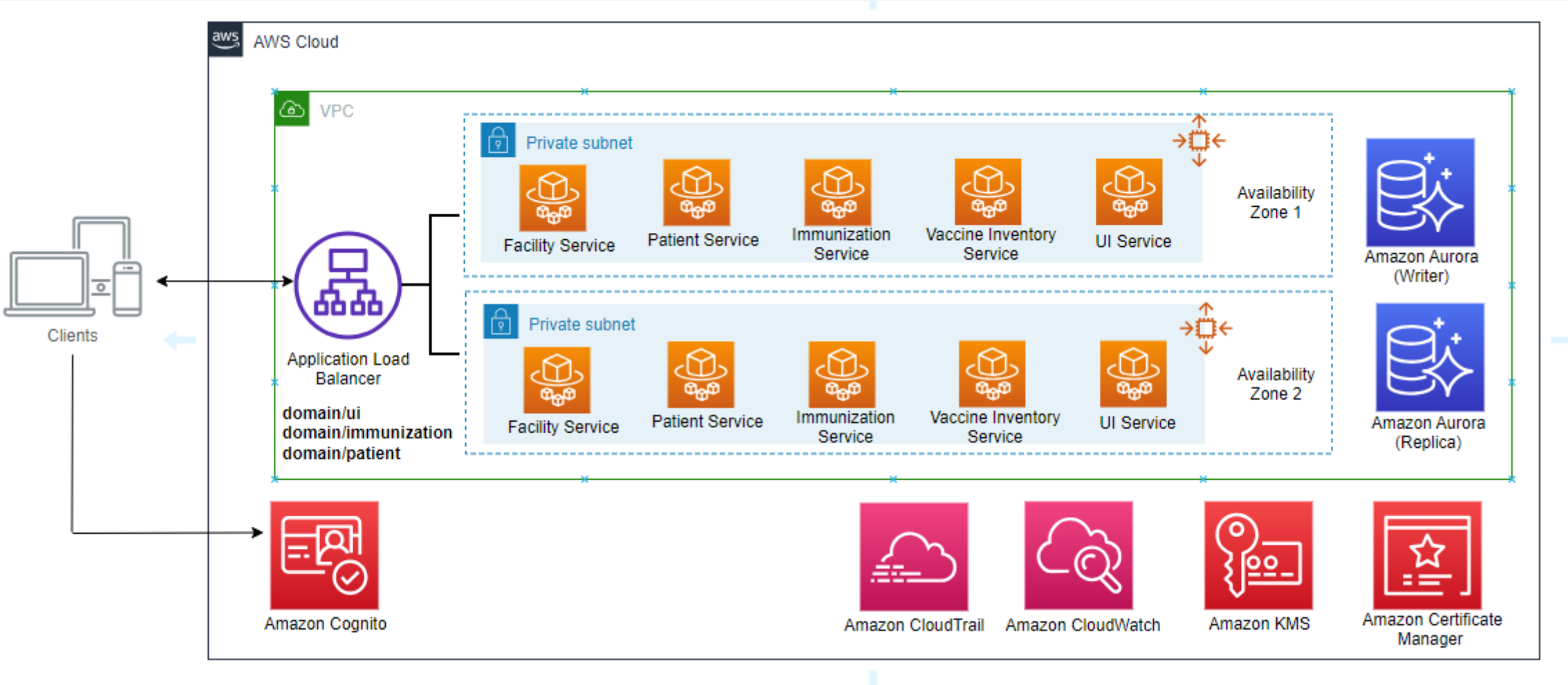
Potential for repeatable solutions

Lift & Shift

Legacy Applications: Minnesota Migrates Minnesota Immunization Connection (MIIC) to AWS

- MIIC on premise servers failing
- Business need for 24/7 availability
- Requirement to scale rapidly to support COVID-19 mass vaccination efforts
- Increased demand for query/response
- Four week migration from on premise to AWS hosted environment

New Cloud Native Technology



Ways AWS is helping Public Health

Modern Data Analytics

Analytics and Business Intelligence


Data preparation


Data integration


Analysis *(streaming, interactive, statistical, operational)*


Visualization

Artificial Intelligence (AI)


Text comprehension, translation, & extraction


Image recognition


Speech transcription


Smart search

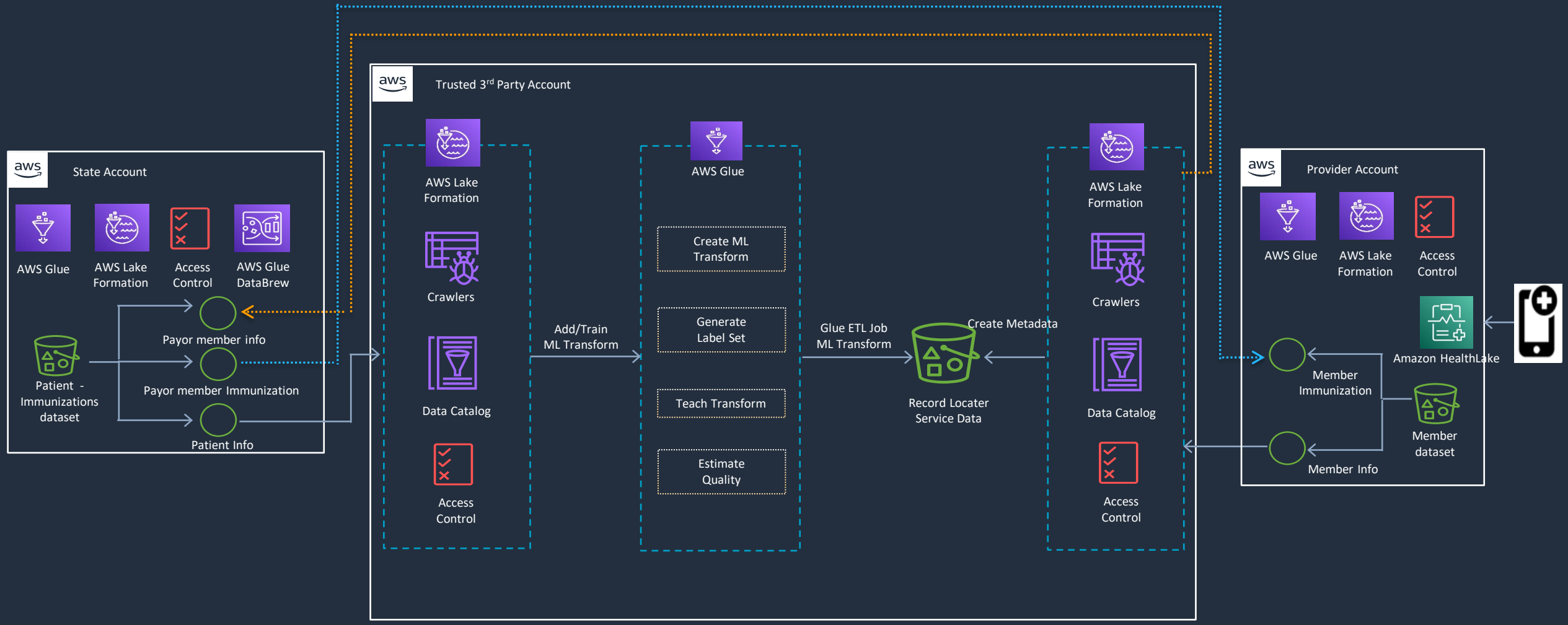

Anomaly detection


Forecasting

Machine Learning (ML)


Build, test, train, tune, & deploy models

FHIR Bulk Query for IIS



Democratizing Genomic Sequencing Analytics

Wisconsin State Laboratory of Hygiene
UNIVERSITY OF WISCONSIN–MADISON

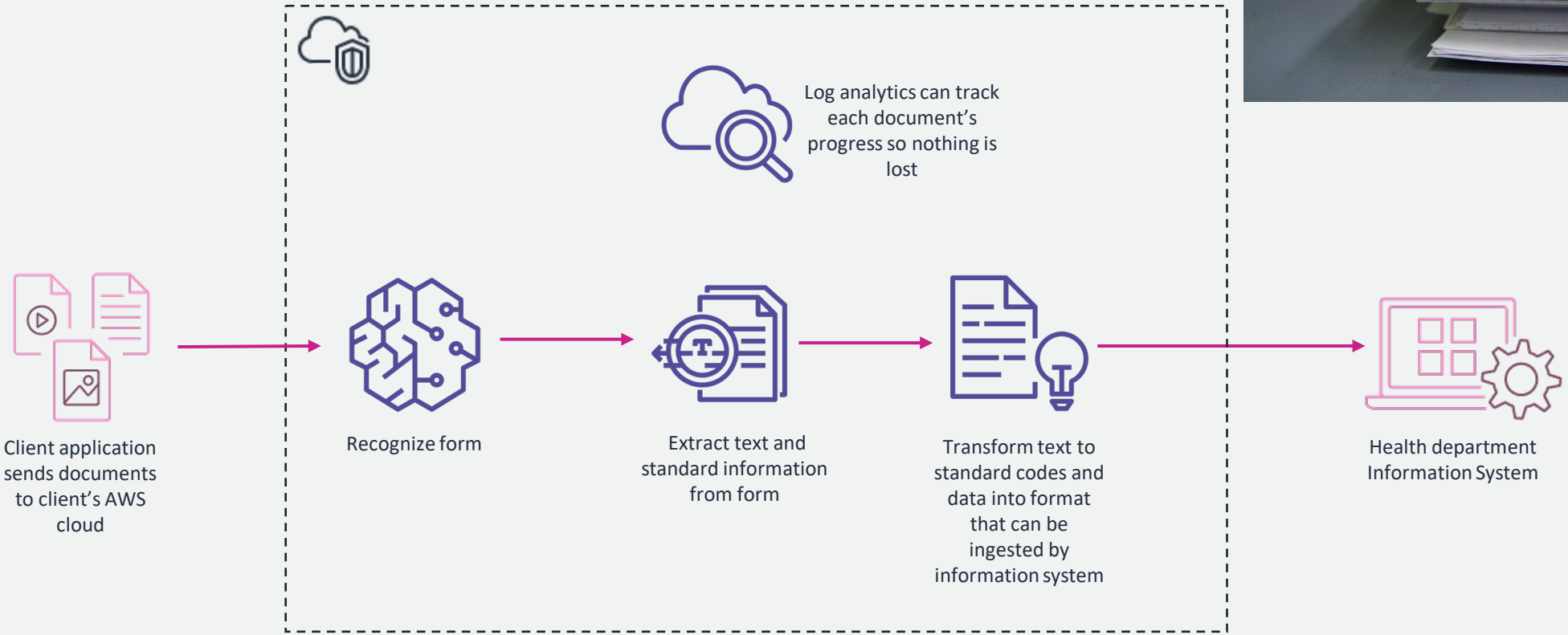
aws

twobulls

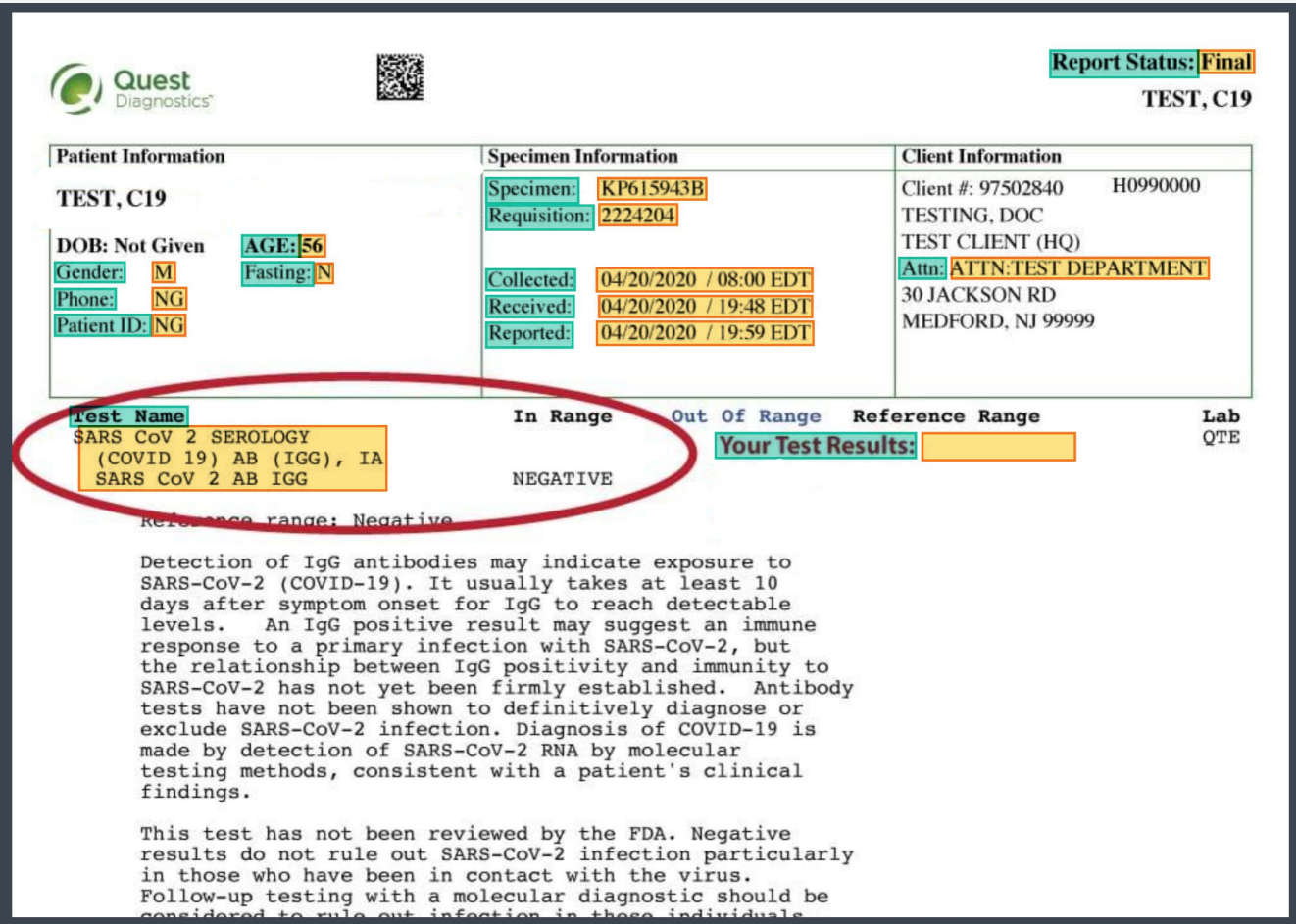
“The launch of Easy Genomics means public health labs that don’t have technical staff now have access to a tool that makes it simple to run genomic pipelines on their lab tests. That means communicable diseases like COVID-19 can have their variants far better tracked by public health authorities. We’re proud to be a key partner in this impactful project. Making it open source is the cherry on top of the cake.” –Evan Davey, Founder Two Bulls

aws

Intelligent Document Processing



Key-Value Pairs Identified From Less Structured Reporting Formats



Quest Diagnostics

Report Status: Final

TEST, C19

Patient Information	Specimen Information	Client Information
TEST, C19	Specimen: KP615943B	Client #: 97502840 H0990000
DOB: Not Given AGE: 56	Requisition: 2224204	TESTING, DOC
Gender: M Fasting: N		TEST CLIENT (HQ)
Phone: NG	Collected: 04/20/2020 / 08:00 EDT	Attn: ATTN:TEST DEPARTMENT
Patient ID: NG	Received: 04/20/2020 / 19:48 EDT	30 JACKSON RD
	Reported: 04/20/2020 / 19:59 EDT	MEDFORD, NJ 99999

Test Name	In Range	Out Of Range	Reference Range	Lab
SARS CoV 2 SEROLOGY (COVID 19) AB (IGG), IA			Your Test Results:	QTE
SARS CoV 2 AB IGG	NEGATIVE			

Reference range: Negative

Detection of IgG antibodies may indicate exposure to SARS-CoV-2 (COVID-19). It usually takes at least 10 days after symptom onset for IgG to reach detectable levels. An IgG positive result may suggest an immune response to a primary infection with SARS-CoV-2, but the relationship between IgG positivity and immunity to SARS-CoV-2 has not yet been firmly established. Antibody tests have not been shown to definitively diagnose or exclude SARS-CoV-2 infection. Diagnosis of COVID-19 is made by detection of SARS-CoV-2 RNA by molecular testing methods, consistent with a patient's clinical findings.

This test has not been reviewed by the FDA. Negative results do not rule out SARS-CoV-2 infection particularly in those who have been in contact with the virus. Follow-up testing with a molecular diagnostic should be considered to rule out infection in these individuals

Report Status:
Final

Specimen:
KP615943B

Requisition:
2224204

AGE:
56

Gender:
M

Fasting:
N

Collected:
04/20/2020 / 08:00 EDT

Phone:
NG

Attn:
ATTN:TEST DEPARTMENT

Received:
04/20/2020 / 19:48 EDT

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Cloud training pathways for public health professionals

The AWS Training Pathways for Public Health are designed for public health professionals to learn more about the cloud and the AWS services that can help them on their modernization journey. Read this blog to learn more.

Questions & Answers

End of Day 1

See you tomorrow!