

September 27, 2023

# Challenges adopting new technology: Learnings from developing an eCR pipeline with Los Angeles County DPH



# Agenda

- **Who we are**
- **Our work in public health**
- **Pilot overview**
- **Pipeline architecture**
- **Barriers to adoption**
- **Secret sauce**

# Who we are



Skylight

Skylight is a digital consultancy using design, technology, and procurement to help agencies deliver better public services.

**Dan Paseltiner** — Data Engineer with ~8 years of experience building software to process and analyze data in the physical sciences, neuroscience, and public health (Maine CDC).

**Amrita Bhatti** — Product Manager with ~7 years experience navigating highly technical product environments with deep knowledge of agile software development principles and human-centered design.

# Our work in public health

## **We've been a key partner of the CDC in designing the future of the Data Modernization Initiative:**

- We're at the forefront of building flexible, interoperable, and sustainable systems for public health.
- We built [SimpleReport](#), a COVID-19 test result reporting tool that's processed over 7 million test results and counting.
- We are the engineers, PM's, and researchers on CDC's PRIME Data Integration Building Blocks (DIBBs) team.

# Public health data strategy

## Success is measured by 2-year milestones (for Goal 1)

### Public Health Data Goal

**1 Strengthen the core of public health data**  
Ensure Core Data Sources<sup>2</sup> are more complete, timely, rapidly exchanged, and available to support the integrated ability to detect, monitor, investigate, and respond to public health threats

### Milestones within 2 years<sup>1</sup>

#### End of 2023



STLs<sup>3</sup> enabled to submit a generic core case data feed that can be used for national disease notification



portal, direct integration, or use of intermediary) with at least 1 healthcare partner for at least 1 lab program



75% of CDC infectious disease labs send lab test results to external partners electronically (e.g., using EUB, CSDR, intermediary)



Reduced time to send mortality data to and receive coded cause of death data from CDC for 12-15 jurisdictions<sup>4</sup> through use of FHIR messaging



CDC receives and ensures access to commercial lab data from at least 2 major national commercial labs to enable situational awareness across multiple conditions

#### End of 2024



Core case data for select nationally notifiable conditions are reported using a common format, using a CDC Core Data concept, and shared back in near real-time to CDC programs and STLs<sup>3</sup> partners to access



direct integration, or use of intermediary) with at least 1 healthcare partner for at least 1 lab program



80% of lab test order requests received electronically at CDC infectious disease labs (e.g., using EUB, CSDR, intermediary)



Reduced time to send mortality data to and receive coded cause of death data from CDC for 38 additional jurisdictions (42-45 total)<sup>4</sup> through use of FHIR messaging



CDC receives and ensures access to commercial lab data from at least 3 major national and regional commercial labs to enable situational awareness across multiple conditions



Increased participation to 80% (from 73% today) of U.S. non-federal emergency departments to increase representativeness of USDP<sup>5</sup> data sources and users



**32 jurisdictions<sup>3</sup> are ingesting eCR data into disease surveillance systems**

Potential impact: <7 days needed to detect a suspected disease outbreak and begin nation-wide monitoring, through using faster case, lab, emergency department, mortality data

<sup>1</sup> Accompanying the Public Health Data Goals are associated implementation activities with STLs, healthcare partners, and other federal agencies. <sup>2</sup> Data including electronic case reporting (ECR), lab reporting/electronic lab reporting (ELR), Electronic Case Notification Results (ECNR), emergency department mortality, National Syndromic Surveillance Program (NSDSP) emergency department data, vital statistics information, healthcare reports including National Healthcare Safety Report (NHSR) data, & USDP (see #42-45). <sup>3</sup> or other related jurisdictions. <sup>4</sup> 13

# Los Angeles County Department of Health <> Data Integration Building Blocks Pilot



# Pilot goals



## Business

eCR data is available in an easy-to-use format for LAC to conduct meaningful analysis and case investigation



## Product

LAC IT has an ingestion pipeline for eCR, ELR and ADT, with the ability clean, transform, and link data, as well as scale with other datastreams



## Team

LAC team gains more experience with cloud services and modern development tools

# Assumptions about LAC

- High technical maturity
- Large public health agency (PHA)
- Well-resourced\*

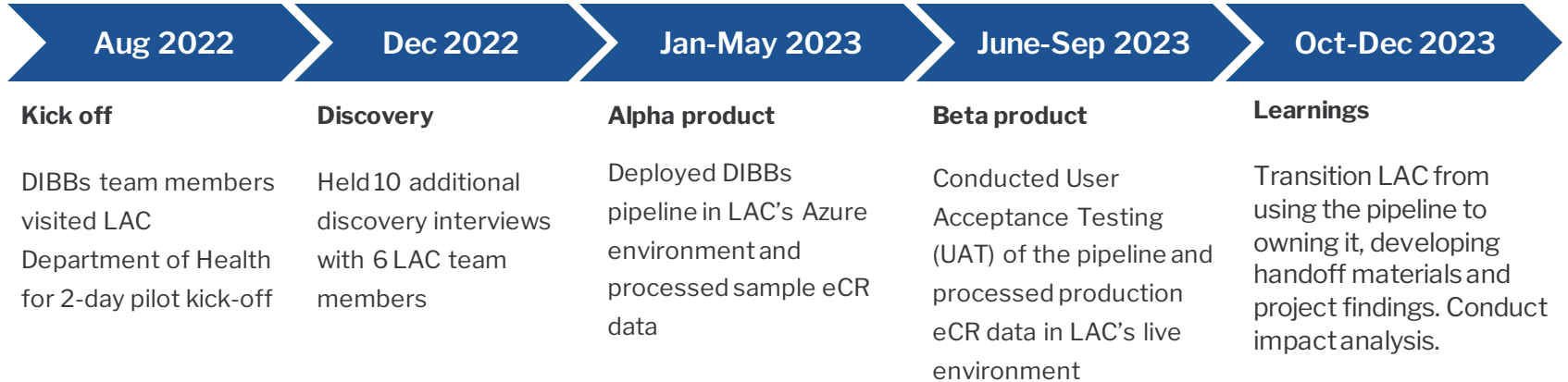
\*Relative to other PHAs



# Challenges working with eCR

- Incoming data often formatted incorrectly and/or missing information
- Cannot easily identify invalid messages
- Many incoming eCR records contain very similar information
- Extracting relevant information from an incoming eCR record is time consuming
- eCR are more complex and information rich than eLR

# Pilot timeline



# LAC problem statements

## What problems surfaced?

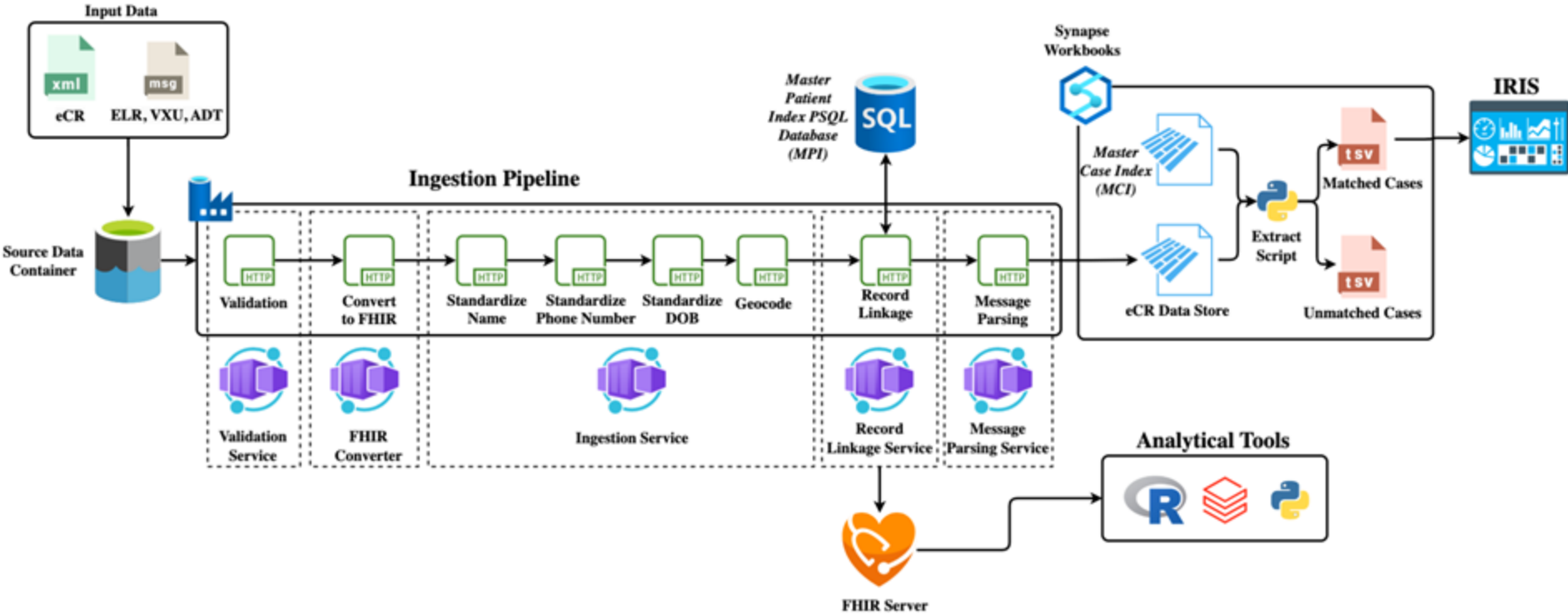
- CliniSys does not support eCR data
- Unable to parse eCR data easily in tabular format
- Data ingestion is disparate and siloed across datastreams
- Commercial integration engines are expensive
- Cloud migration is challenging without extensive cloud expertise

# Technical needs met

## eCR Needs

- ✓ Validate incoming data
- ✓ Enrich through standardization and geocoding
- ✓ Record linkage
- ✓ Flexible parsing based on public health need
- ✓ External data store
- ✓ Transform into a format supported by surveillance system

# Pipeline architecture



# Expectation...the perfect handoff



# Reality...unexpected obstacles



# Familiar problems in public health

## Structural barriers

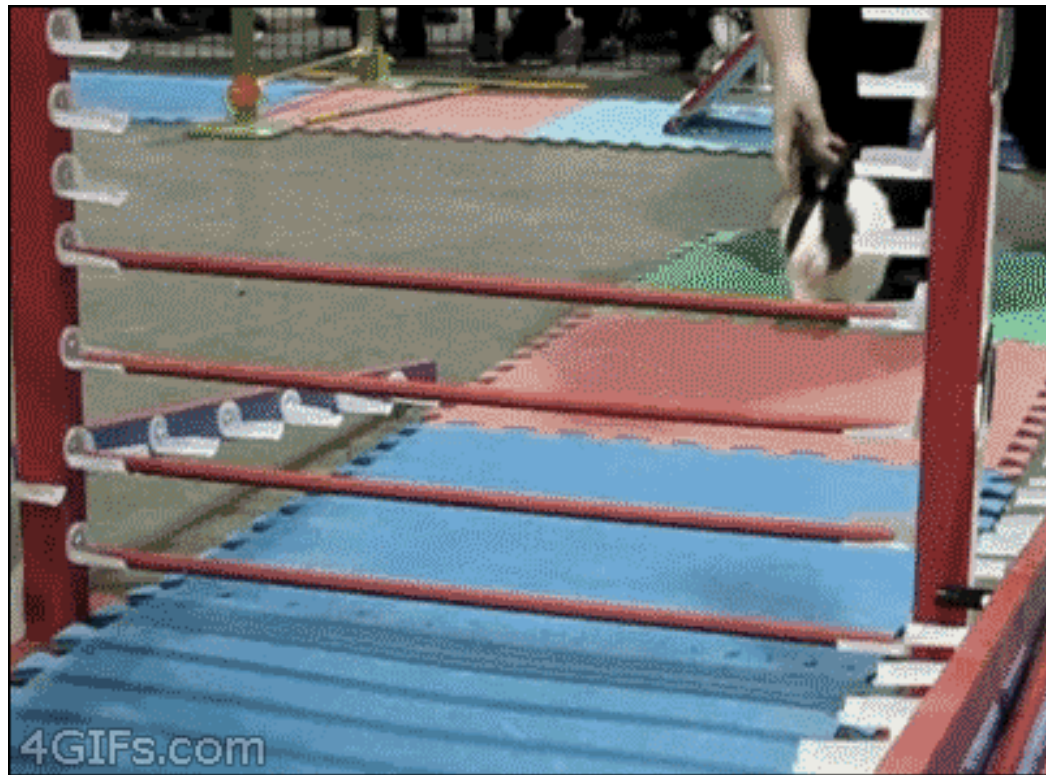
1. Early in cloud adoption
2. Limited staffing capacity
3. Lack of trust
4. Gap between implementation and ownership

## Solutions

1. Invest in jurisdictional cloud hosted services
2. Upskill and hire additional staff
3. Recognize sensitivity of processing public health data
4. Anticipate and plan for the heavy lift of integrating new services



# How did we adjust course?

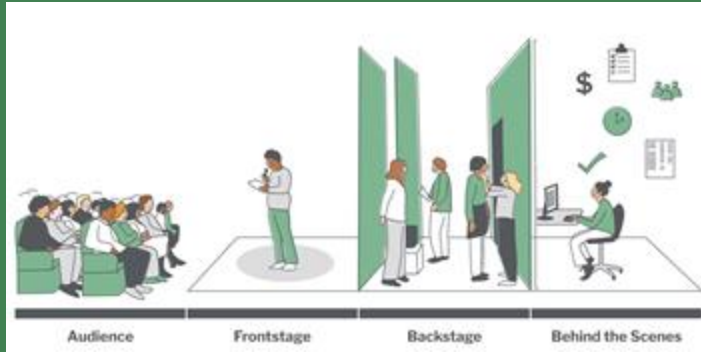


# Secret sauce — ABLE

1. **A**pply a service design lens from the start
2. **B**uild enablement into your process
3. **L**everage research-driven design
4. **E**ngage in continuous user testing



# Apply a service design lens from the start



- Check your assumptions
- Success of highly technical solutions requires substantial understanding of the entire ecosystem

# Build enablement into your process



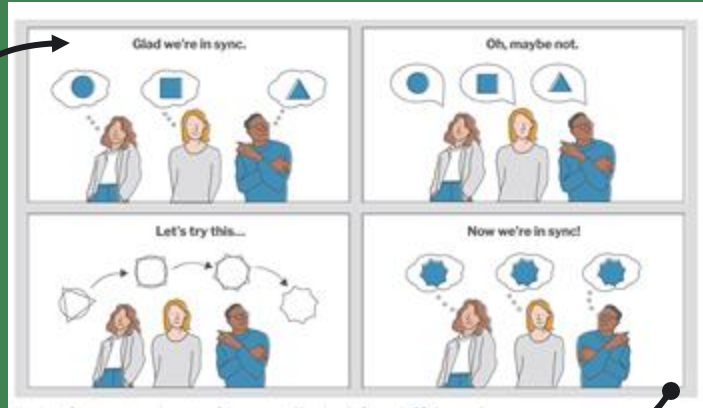
- It's not enough to just update a jurisdiction on what we're doing and expect them to use the product at the end
- We brought LAC into our agile ceremonies and held regular product demonstrations

# Leverage research-driven design



- User research and design should iterate hand-in-hand with engineering efforts
- Ongoing research is imperative; relying only on initial discovery is insufficient

# Engage in continuous user testing



- User test everything to make sure the product is easy to use
- User acceptance testing drove all of our handoff materials

# Better methods = better results



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# Thank you

Huge thank you to the Los Angeles County Department of Public Health team who has been astounding to work with!



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