

First steps towards an enterprise FHIR solution at the US CDC

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Who am I?

- Ryan Harrison
- Presidential Innovation Fellow
 - Office of Public Health Data, Surveillance and Technology (OPHDST)
 - Office of the Chief Information Officer (OCIO)
 - US Centers for Disease Control and Prevention (CDC)



Contact

- During DevDays, you can find / reach me here:
 - Via Whova App – Speaker’s Gallery
 - Email: rharrison@cdc.gov
 - FHIR Chat

Four major Public Health Data Goals enable the core public health missions

Public Health Data Goals

Core public health missions



1 Strengthen the core of public health data

Ensure Core Data Sources¹ are more complete, timely, rapidly exchanged, and available to support the integrated ability to detect, monitor, investigate, and respond to public health threats

2

Accelerate access to analytic and automated solutions to support public health investigations and advance health equity

Make tools available so STLTs and other public health decision-makers can better use public health data to address health disparities

3

Visualize and share insights to inform public health action

Serve as a trusted source for near real-time visualizations and offer situational awareness for the public and decision-makers to understand risks, make decisions, and direct resources

4

Advance more open and interoperable public health data

Enable exchange of interoperable data so that healthcare, STLTs, federal agency partners, and CDC programs can access and use data they need, when they need it

CDC Enterprise Data Exchange (DEX)

FOR public health actors

WHO exchange data with the CDC

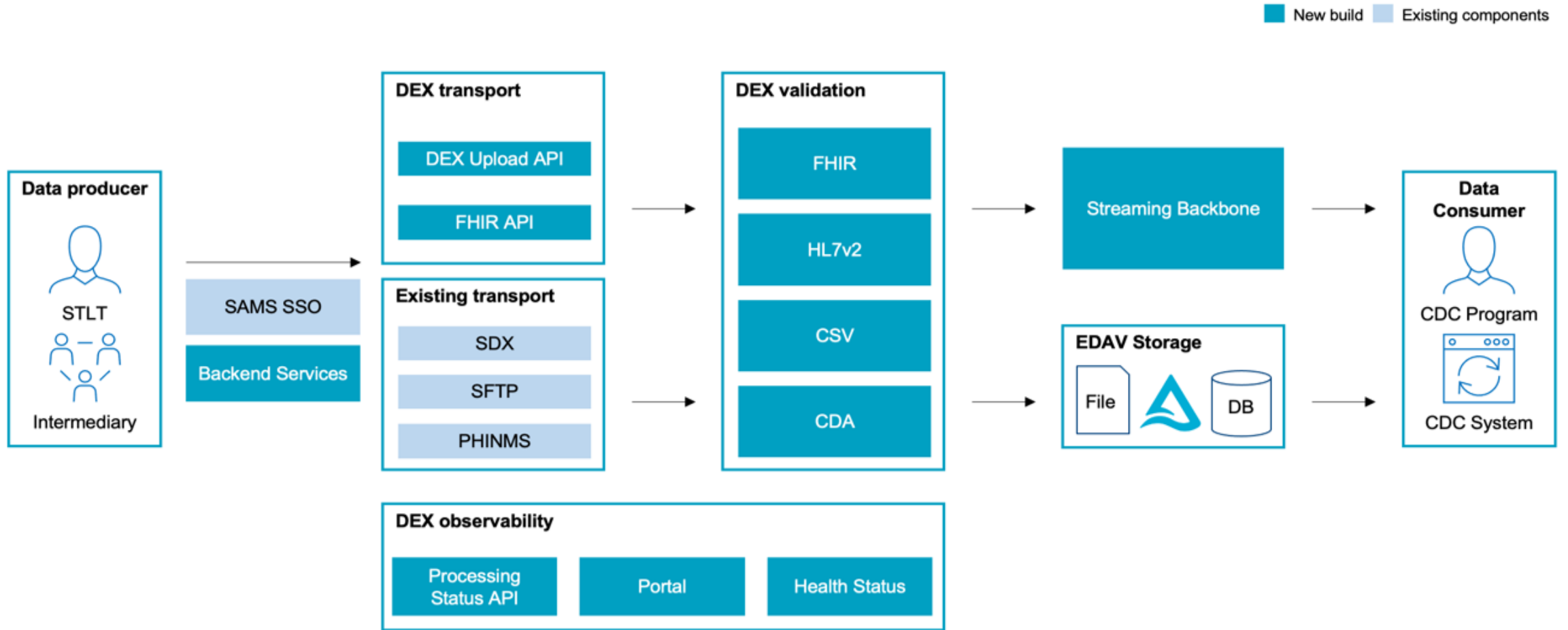
THE Enterprise Data Exchange (DEX) is a new cloud-native centralized data ingestion, validation, and observation service scoped for common data types (HL7v2, **FHIR**, CDA, XML, CSV)

THAT reduces the burden of data exchange with the CDC

UNLIKE current decentralized, duplicative, sometimes fragile, point-to-point transport and validation services

OUR PRODUCT increases the visibility of data, reduces maintenance requirements, and provides a scalable ingestion and validation engine for future pandemic level reporting

DEX Conceptual Architecture



Connectathon 33 – MedMorph Track

Health Care Surveys and Flu-Surv-NET

- First test of DEX infrastructure at Connectathon 33
- Designed to answer essential questions of interest for health care policy makers, public health professionals, and researchers
- Transitioning from medical record abstraction to EHR extraction
- MedMorph Reference Architecture
 - Health Care Surveys Content IG

Enterprise FHIR Roadmap (Business)

Phase 0

- *Status:* “Out of the Box” Azure API for FHIR
- Azure API for FHIR in CDC Moderate environment (no authorization)

Phase 1 (Current State)

- *Status:* In Progress, first public testing event (Connectathon) May 2023
- *Use Case:* MedMorph Health Care Surveys
- *Paradigm:* Messaging
- *Directionality:* Receive
- *Authentication:* Machine-to-machine

Phase 2

- *Status:* Pending use case
- *Use Case:* TBD, person authorization
- *Authentication:* Person Authentication > STLT (from SAMS)

Phase 3

Use Case: TBD, TEFCA Facilitated

Enterprise FHIR Roadmap (Technical)

Phase 1 (Current State)

- Machine-to-machine Authorization
 - [SMART on Fast Healthcare Interoperability Resources \(FHIR\) Backend Services Authorization Flow \(Asymmetric\)](#)
 - B2B Authorization Extension Object
- Machine-to-machine Authentication: Identity provider to support “pure” machine identities
- \$process-message

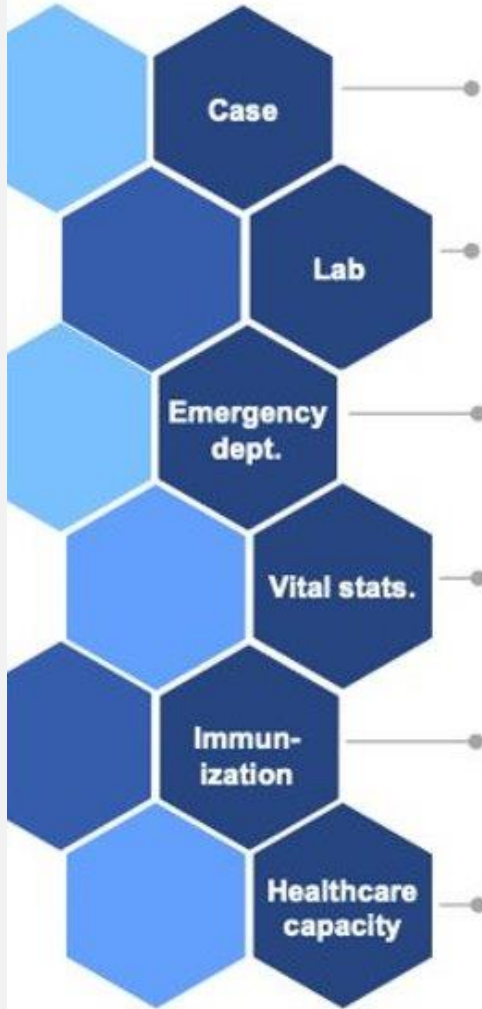
Phase 2

- Person Authorization: [SMART on FHIR App Launch Flows](#)
- Person Authentication: Integrate with SAMS (CDC’s SSO Solution)
- [UDAP IG](#) (dynamic client registration)
- Provenance resources for data going in/out of the FHIR server

Phase 3

- [TEFCA Facilitated FHIR IG](#)
- [\\$match](#)
- [BulkData IG](#)

Core Data Sources



Case data represent comprehensive disease and condition information used by public health to understand disease burden, know who is at risk, and identify outbreaks

Laboratory data, including test results and test type, enable public health agencies to track disease trends and identify outbreaks or exposures, and help frontline providers diagnose and treat health conditions

Emergency department data, including clinical diagnoses, signs, and symptoms, help identify near real-time trends for new, emerging, and developing public health threats to inform faster detection and response

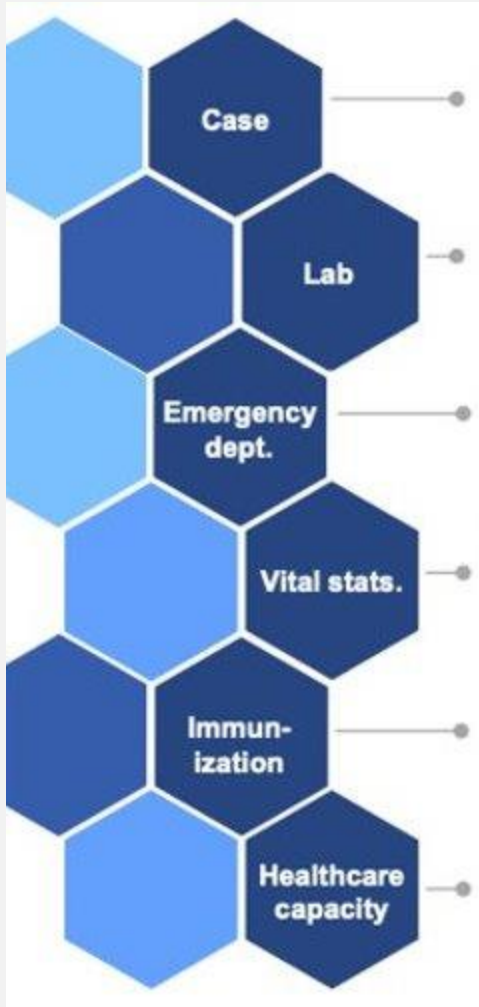
Vital statistics data include birth and death data and are essential to understand disease severity, mortality, trauma, and toxicity that might signal a larger public health emergency

Immunization data capture vaccine doses administered (both routinely recommended and response-related) to support calculating vaccination coverage levels and trends

Healthcare capacity and utilization data assess availability of healthcare resources, including staff, beds, and equipment, aiding understanding of health system stresses and disease severity to inform resource allocation

1. Core Data Sources as defined in CDC Advisory Committee to the Director (ACD) [Data and Surveillance Workgroup \(DSW\) Report](#); non-exhaustive of all data sources critical to public health awareness and response (e.g., advanced molecular detection data)

FHIR Transport Paradigms



- REST, Query
 - Individual Resources
 - Bulk Data Access
 - CQL



- Messaging
 - Trigger-based
- Document

Thank you!

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For more information about CDC's Front Door, visit

<https://www.cdc.gov/surveillance/data-modernization/technologies/cdc-front-door.html>

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC).

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