CDC-ONC Industry Day

Office of Public Health Data, Surveillance, and Technology (OPHDST)

Office of the Chief Information Officer (OCIO)

Center for Forecasting and Analytics (CFA)

February 27 – 28, 2023

Washington, DC

Welcome

Judy Monroe, MD

CEO and President, CDC Foundation

OPHDST Strategic Priorities and Needs from Industry

Jennifer Layden, MD, PhD

Acting Director of CDC's Office of Public Health Data, Surveillance, and Technology (OPHDST)

Our Ultimate Goal

To move from siloed and brittle public health data systems to connected, resilient, adaptable, and sustainable **'response-ready'** systems that can help us solve problems before they happen and reduce the harm caused by the problems that do happen.

Better, Faster, Actionable Insights for Decision-Making
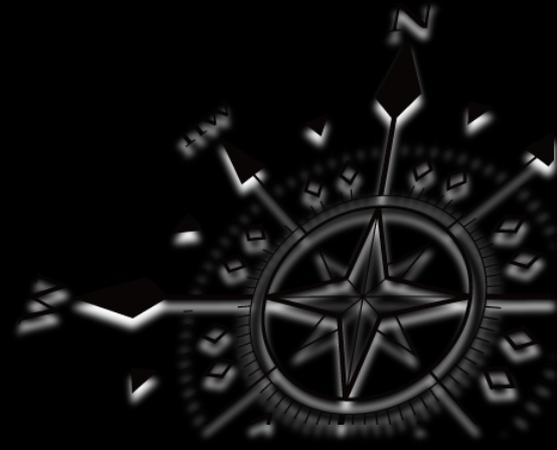
Office of Public Health, Data, Surveillance and Technology (OPHDST)

Why this Matters

Establishes an accountable office within CDC to execute data modernization

Ensures accountability for CDC's Public Health Data Goals:

- Structures the organization to support **four core public health missions**
- Defines and empower **accountable owners** within OPHDST and across the agency
- Establishes **regular cadence** of Public Health Data Goal updates for the agency

We Are Positioned for Increased Efficiency

Public health core data systems

Technology solutions and tools

Data policy essential to the public health mission

By bringing key functions under one roof, the new Office of Public Health, Data, Surveillance and Technology (OPHDST) serves as a platform for better partnerships and collaboration for data modernization

OPHDST will Focus on Executing a Unifying Public Health Data Strategy
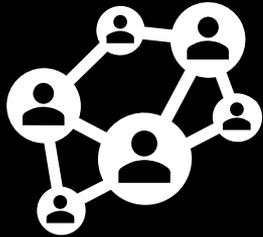
The Public Health Data Strategy…

- **Outlines the data, technology, policy, and administrative actions** needed to efficiently and securely exchange critical core data across healthcare and public health

- **Describes a path to address gaps in the public health ecosystem**, helping the nation become response-ready, promote health equity, and improve health outcomes for all

Addressing Challenges Experienced Across Public Health

ILLUSTRATIVE (!) Challenge ⟷ High-level data flow

30%+ of COVID-19 cases missing data on race and ethnicity early in the pandemic[1]

~3 months until CDC started receiving mpox vaccination rates from STLTs after the first reported case[2]

Up to **80%** of epidemiologist time spent cleaning and wrangling data[4] because of non-interoperable systems

State, Tribal, Local, and Territorial health departments (STLTs)

Healthcare (labs, providers)

National public health (CDC, Federal partners)

Public

The Public Health Ecosystem

~70% of healthcare organizations use fax to send or receive care records[3]

6+ months often needed to develop and potentially rework Data Use Agreements[5]

12+ months for data on some reportable conditions to become available in national datasets or be disseminated in accessible and interoperable formats[5]

The Public Health Data Strategy Advances Four Core Missions

To **advance four core missions of a robust public health data ecosystem** aimed at improving health outcomes equitably…

Detect and monitor

Investigate and respond

Inform and disseminate

Be response-ready

…**the Public Health Data Strategy** …

Addresses **imperative of the CDC Moving Forward effort** to consistently deliver public health information and guidance to Americans in near real-time

Builds on **lessons learned during the COVID-19 pandemic** and other recent public health threats

Aligns data modernization efforts at all levels of public health and across partners, **focusing execution on near-term priority gaps**

Articulates how success will be defined, with 2-year milestones for public health data and solutions

Creates accountability for public health data with the newly established Office of Public Health Data, Surveillance, and Technology at CDC

Four Goals Will Shape Our Work for the Next Two Years

Public Health Data Goals

By the end of 2024, 2-year milestones ensure…

1   **Strengthen the core of public health data**

- STLTs have reduced reporting burden
- Labs can forecast needs better
- STLTs can access lab reports more quickly and through multiple pathways
- CDC has robust situational awareness that informs decision making across the nation
- STLTs and CDC programs have access to more representative early warning signals from emergency departments

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

- STLTs and CDC can identify threats faster as more hospitals in rural communities send case data electronically
- STLTs can address pain points in the public health workflow
- STLTs and communities can proactively identify, prevent and mitigate disproportionate impact on populations

3   **Visualize and share actionable insights to inform public health action**

- STLTs and CDC programs receive quicker access to data and insights from Core Data Sources
- Americans can access near real-time data and visualizations through a centralized data dissemination platform

4   **Ensure access, exchange and use of interoperable data and solutions**

- CDC establishes a strategic pathway of data exchange with providers' EHRs
- CDC and STLTs increase data exchange back to healthcare providers
- Data sharing and access is easier and there is quicker access to minimal data necessary for response
- CDC has measurably, securely, increased the amount of accessible open data

Achieving our Public Health Goals Requires Effective Partnerships

To date we have engaged partners across public health, research, academia, and industry through three key mechanisms

Data and Surveillance Workgroup

Provides input on agency-wide related to the scope and implementation of DMI

DMI Consortium

Convenes to share perspectives on priorities and strategies for data modernization

CDC Foundation

Collaboration to strengthen engagement with industry partners

We are Looking to Further Enhance Partnerships with Industry

We are eager to expand industry partnerships to ensure that we move forward together to meet the needs of the American people

## Together we can

Learn & Inform
Explore new tools, systems, services, and innovations together and enhance awareness about CDC and ONC's priorities

Partner & Collaborate
Promote collaboration across federal, private industry, and STLT landscapes to break down silos, foster innovation and develop new products

Looking Ahead
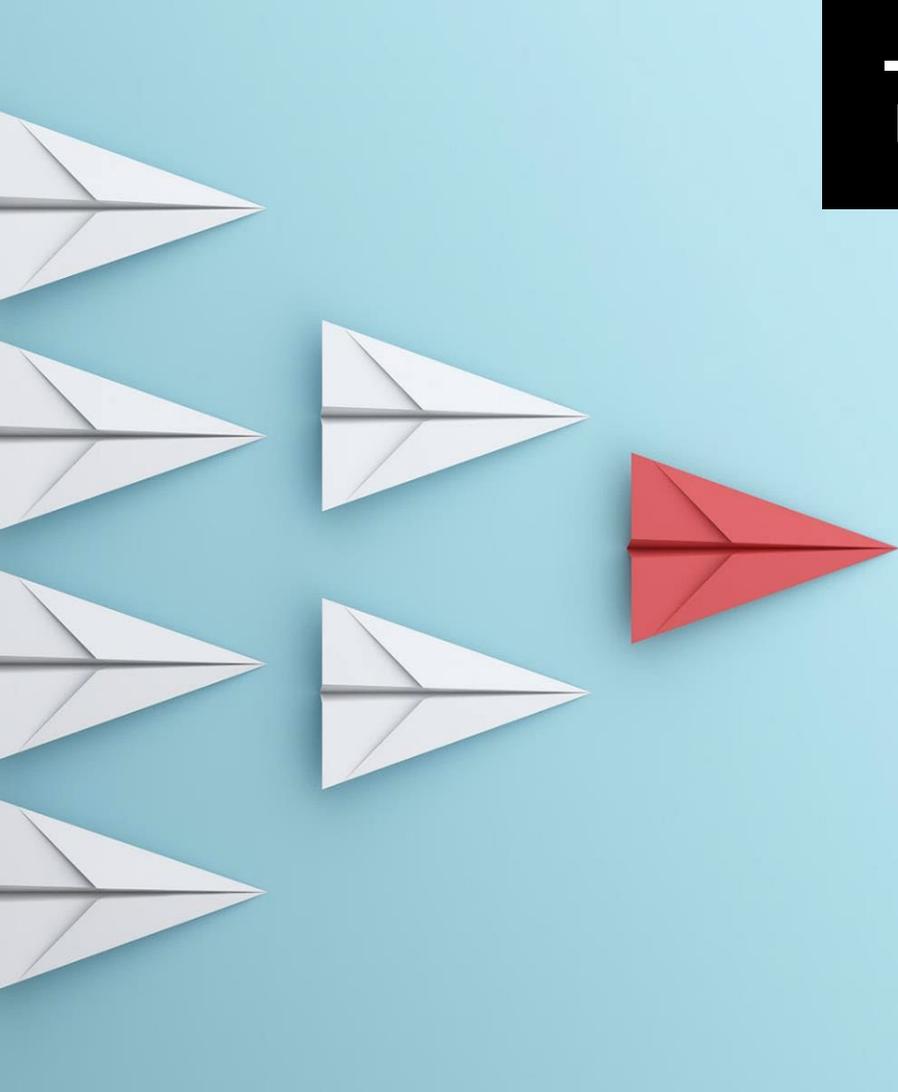
- We hope to continue engaging industry partners – stay tuned for more!

- We are seeking your feedback on the most useful forums for engagement

- Contact us with any feedback, ideas, and questions via our mailbox DMIpartnerships@cdc.gov

OCIO Strategic Priorities and Needs from Industry

Suzi Connor

CDC Chief Information Officer

Director of CDC's Office of the Chief Information Officer

Priorities and Opportunities for 2023

- **Building** response ready cloud infrastructure to get data quickly and reliably

- **Developing and adopting** CDC Front Door infrastructure to streamline data ingestion

- **Investing** in infrastructure for public health data dissemination

- **Reusing** common standardized infrastructure for CDC's multiple core data sources

- **Improving** CDC programs and external partners' ability to better discover API to access data and capabilities

- **Piloting** use cases around artificial intelligence and machine learning

North Star Architecture Overview

1

Information Exchange Zone

← → Report Stream

2

Shared Data and Analytics Zone

Shared Applications

Shared Data

3

Enterprise Zone

Enterprise Data Analytics and Visualization (EDAV)

Public Health Cloud

Enterprise Data Catalogue (EDC)

← → DEX
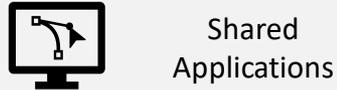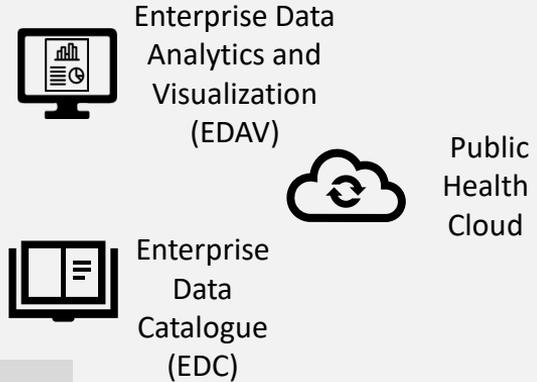
🔒 **Authentication**

Two use cases selected to "test drive" North Star Architecture

These cases provide key information about opportunities and gaps as we scale it to numerous notifiable infectious and non - infectious diseases

1 **Viral Hepatitis**
Detect outbreaks of viral hepatitis and inform interventions to substantially improve case management and reduce transmission

2 **Maternal and Newborn Health**
SET-NET: Surveillance to Emerging Threats to Mothers and Babies
Improve maternal health and prevent pregnancy complications and maternal deaths

✓ **Public health impact**

✓ **Feasibility**

✓ **Scalability**

What is the Data Exchange (DEX)?

1
THE PROBLEM
Exchanging data with the CDC is not standardized, labor-intensive, complicated, and often manual.

2
THE SOLUTION
DEX acts as the "CDC Front Door" to provide a standardized, streamlined data intake process.

3
THE VALUE
DEX simplifies data exchange by standardizing entry points, scalable, secure, and automated options for CDC Partners and Programs.

What is the Shared Analytics Zone (SAZ)?

1

THE PROBLEM

The current public health data ecosystem is fragmented, and STLT partners don't have the same access to data domains and analytic tools.

2

THE SOLUTION

The SAZ provides STLT partners access to data and cloud-based analytic tools that foster collaboration and lead to improved public health insights.

3

THE VALUE

The SAZ provides STLT turnkey capabilities to leverage CDC-provided public health data domains and applications.

What is the Enterprise Data Analytics and Visualization (EDAV) platform?

1
THE PROBLEM

Right now, analyzing and visualizing critical public health data is a complex, siloed process that slows down effective action.

2
THE SOLUTION

EDAV is a cloud-based platform that allows customers to store, analyze, visualize, and share data on a common platform.

3
THE VALUE

EDAV breaks down data silos, by centralizing data ecosystems. This common platform allows people to access, analyze and visualize data quickly to address complex public health challenges.

What is External Health Partner Authentication?

1 THE PROBLEM

CDC collaborates and shares data with many partners requiring both CDC and partners to present credentials to access each other's systems and data repositories.

2 THE SOLUTION

Modern cloud-based user and machine authentication with a focus on scalability and security through trust with market leading identity providers.

3 THE VALUE

Faster, easier authentication for people and machines to securely collaborate and exchange data.

How do we work together?

You can support us with innovative and cost-effective solutions for:

- ✓ Multi cloud optimization approaches

- ✓ Generative artificial intelligence and machine learning capabilities

- ✓ Multi sector authentication services

- ✓ Advanced accessible visualizations

- ✓ Internet of Things network approaches

- ✓ Advanced cybersecurity and privacy protections

CFA Strategic Priorities and Needs from Industry

Dylan George, PhD

Director of CDC's Center for Forecasting & Outbreak Analytics

Center for Forecasting & Outbreak Analytics (CFA)

Better Data, Better Analytics, Better Response

Analytics Inform Response Efforts Across an Epidemic

ECOSYSTEM • HUMAN CASE • CLUSTERS • OUTBREAK • EPIDEMIC • PANDEMIC • RECOVERY

WILD ANIMALS
LIVESTOCK
MICROBES
INDUSTRIAL AGRICULTURE
SPILLOVER
"LONG FUSE"
REGIONALLY CONTAINED
ENTIRE POPULATION AT RISK

LEGEND
HEALTHY
INFECTED
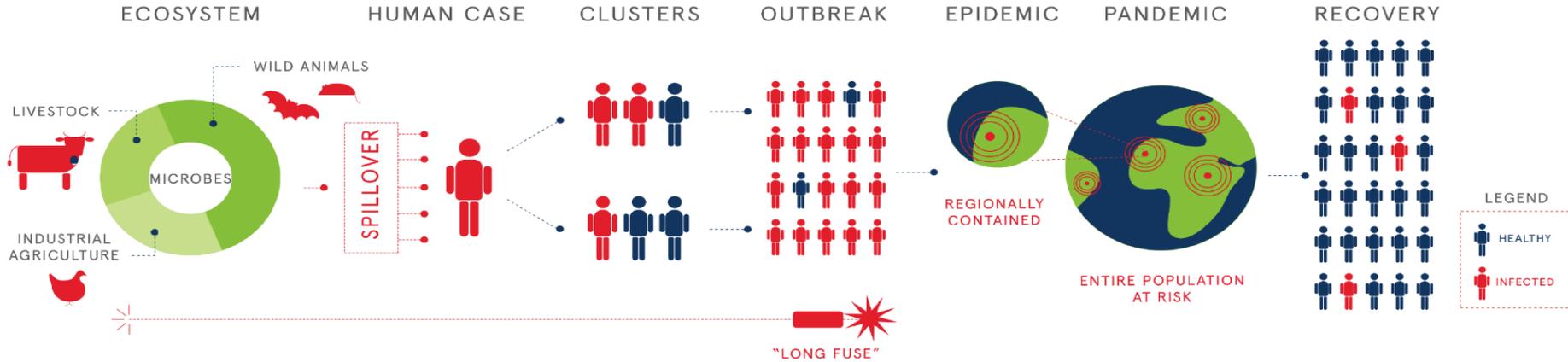
Examples of Outbreak Analytics

Prospective Scenario Analyses	Risk Assessment Tools	Parameter Estimations	Vaccine Effectiveness
Pathogen Characterization	Disease Risk Mapping	Burden, Impact Assessments	Therapeutic Effectiveness
	Phylogenetics	Disease Forecasting	Outbreak Management Scenario Analyses

CFA Value in Outbreaks of Novel Pathogens

Make sense of uncertainty early in an outbreak

- Assess epidemic potential and severity
- Quantify risk and timing of imported cases
- Assess risk to the homeland

Provide early warning, situational awareness

- Develop good-bad-worst planning scenarios; bound uncertainty
- Assess expected impact of interventions
- Produce short term forecasts

Get critical data for the response

- Resource demand projections
- Inform design and targeting of prevention measures
- Monitor vax, treatment effectiveness over time
- Provide data to update scenarios and forecasts

## Support policy, guidance & response

- Inform policy and guidance on:
- Border controls
- Testing, quarantine & isolation
- Countermeasure demand
- Vaccine prioritization
- Surveillance design

Potential Rapid Increase of Omicron Variant Infections in the United States

Updated Dec. 20, 2021   Español | Other Languages   Print
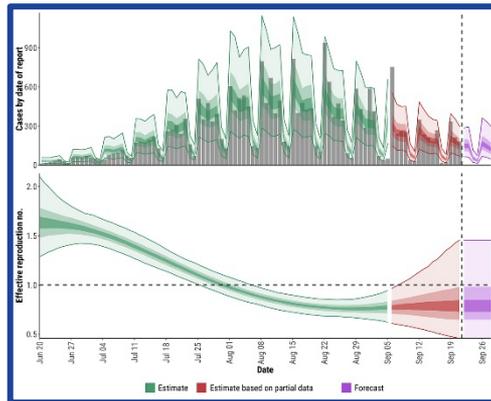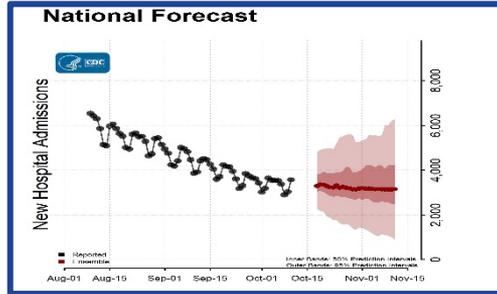
CDC Monkeypox Technical Report 3; Fig 7

CFA Recent Successes

- **Response Support**
  - Anticipation of Omicron surge
  - COVID-19 Forecast Ensemble
  - Assessing China COVID modeling
  - Forecasts of U.S. mpox outbreak
  - Ebola in Uganda analytical support
- Inform Products: Technical Reports
- CFA Workforce Growing
- Piloting the Virtual Analyst Platform
- Appropriation - FY23
- CFA Establishment Finalized

Network to Advance Outbreak Analytics

- CFA will support a network of:
  - **Innovators** to advance the science of outbreak analytics
  - **Integrators** to design and test innovative capabilities in collaboration with public health jurisdictions
  - **Implementors** to scale innovations among jurisdictions
  - Coordination and surge capacity in an emergency
- Necessary connection with STLT jurisdictions
- This network will improve speed, accuracy, and use of data & analytics during health emergencies
- [Grants.gov Forecast Opportunity](#) (CDC-RFA-FT-23-0069)

Innovation

Integration

Implementation

Demographic, Social, and Comorbidity Data Table

Objective: Develop a comprehensive table that includes demographic, social, and comorbidity data that can be used to estimate the number of individuals impacted by a public health emergency

Needs:

- Access to national-level demographic data by geographic location

Epidemiological Studies

Objective: Expand CFA's data network for investigating trends and monitor emerging health threats

Needs:

- Indirect access to large-scale (millions), de-identified U.S. patient medical records
- Analysis of records to detect, monitor, and characterize emerging infectious and non-infectious threats and trends

Data Scientist Support

Requirement: quantitative analyses, data science, data engineering, epidemiological modeling and other relevant support, for modeling and forecasting public health response data

Needs:

- Provide staffing support to CFA in the areas above – modelers, software developers with modeling experience, cloud and data engineering
- Able to surge support during emergencies
- Interface tightly with CFA staff and other contractors as needed

Training Support

Requirement: Design a comprehensive training program for CFA staff that covers infectious disease modeling, data science, and applied large-scale cloud computing; provide regular training events

Needs:

- Provide training program management including curriculum development
- Support staff assessment on key skills across multiple competencies
- Deliver trainings at regular events and provide recorded video archives of presentations and training materials

Link to where the contracts will be posted:

https://sam.gov/content/opportunities

Industry Partners Can Help Advance CFA's Mission

- Support public health response capabilities through enabling technology driven approaches, like advanced analytics and outbreak forecasting

- Support updated public health data authority allowing CDC to support decisions at the federal, state, and local levels

- Support operational and workforce authorities to ensure CDC can rapidly respond to urgent public health needs

Questions:

CFA@cdc.gov

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348   www.cdc.gov

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.