1/19-20/2022
Board of Scientific Counselors, Deputy Director for Infectious Diseases (DDID)

https://www.cdc.gov/ddid/BSC.html

Report to CLIAC

D.M. Wolk, MHA, PhD, D(ABMM)

April 2022

John Auerbach

ACD Meeting Information

The re-established ACD will hold meetings each year at the CDC in Atlanta, Georgia. Meetings are open to the public and available online via live webcast.

ACD Meeting
- February 1, 2022 *(agenda available)*

ACD Meeting
- May 2022 *(tentative)*

ACD Meeting
- August 2022 *(tentative)*

ACD Meeting
- November 2022 *(tentative)*

Total FY 2022 President's Budget Request - $15.4 Billion

Selected Highlights

- **Public Health Infrastructure and Capacity - $400m**

- **Public Health Data Modernization - $150m**

- **Public Health Workforce - $106m**

- **Global Health Protection - $303.2m**

- **Social Determinants of Health - $153m**

- **Ending the HIV Epidemic - $275m**

- **Infectious Diseases and the Opioid Epidemic - $19.5m**

- **Climate and Health - $110m**

- **Immunization and Respiratory Diseases - $713.572m**

- **Infectious Disease Rapid Response Reserve Fund - $35m**
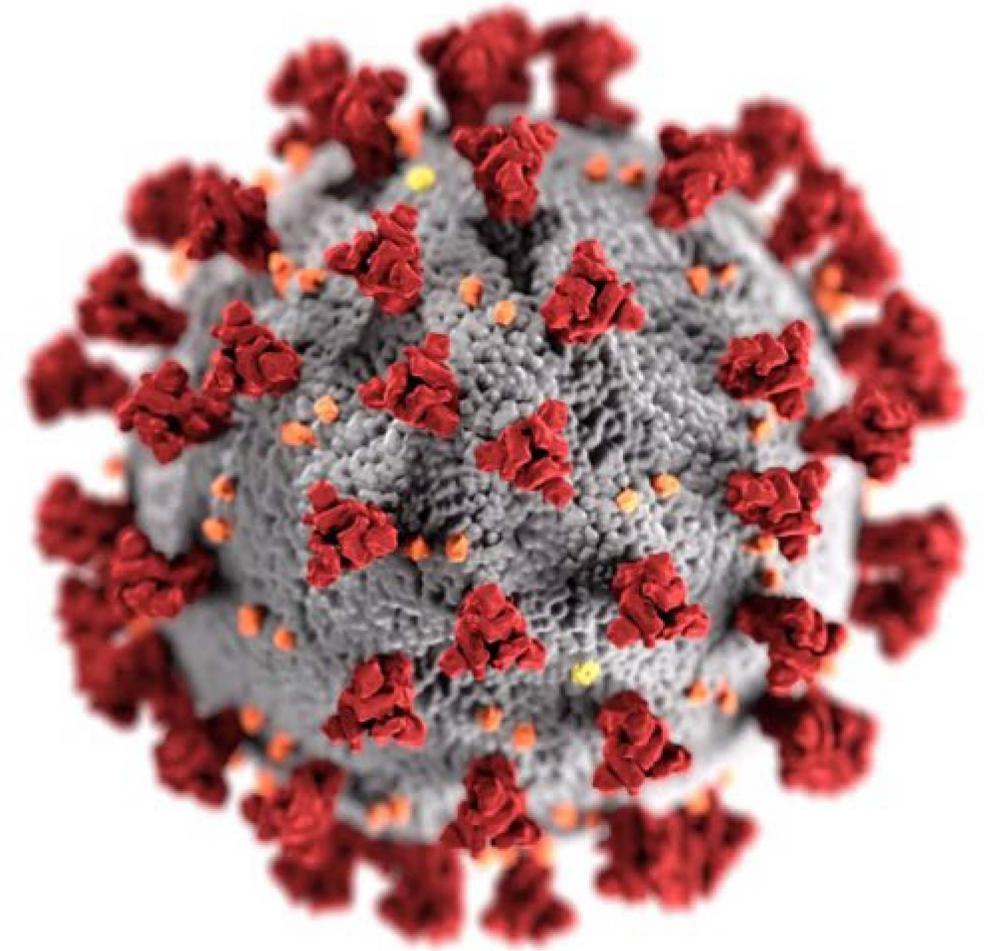
- **Quarantine and Migration - $72.722m**

Excludes: Vaccines for Children Program, World Trade Center, and EEOICPA

BUDGET
OF THE U.S.
GOVERNMENT

FISCAL YEAR 2022

OFFICE OF MANAGEMENT AND BUDGET

THE WHITE HOUSE

CDC COVID-19 Response Update

Barbara Mahon, MD, MPH

CDC COVID-19 Response
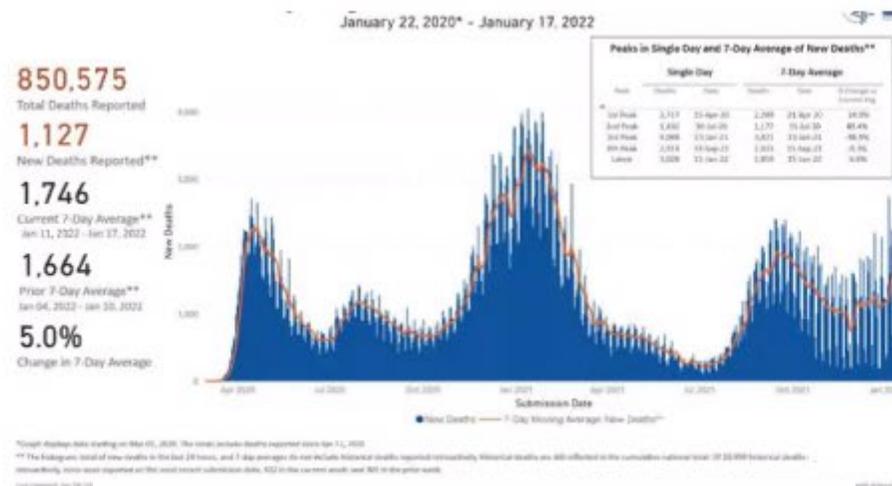Incident Manager

January 19, 2022

cdc.gov/coronavirus

COVID-19 Case Surveillance Summary

https://www.covid.gov/tests

- As of January 17, 2022

   - 7-day average of daily **death counts increased 5.0%** compared with previous week

Omicron Prevalence

- B.1.1.529 (Omicron) estimated at 99.5% of US cases
- B.1.617.2 (Delta) estimated at 0.5% of US cases

Daily Change in COVID-19 Death Counts, United States
March 2020 – January 2022

January 22, 2020* – January 17, 2022

850,575
Total Deaths Reported

1,127
New Deaths Reported**

1,746
Current 7-Day Average**
Jan 11, 2022 – Jan 17, 2022

1,664
Prior 7-Day Average**
Jan 04, 2022 – Jan 10, 2022

5.0%
Change in 7-Day Average

COVID-19 Vaccination Uptake: Domestic

- 75.1% of US population has received at least 1 dose
- 38.7% of fully vaccinated persons have received an additional dose
- 63.0% of US population fully vaccinated
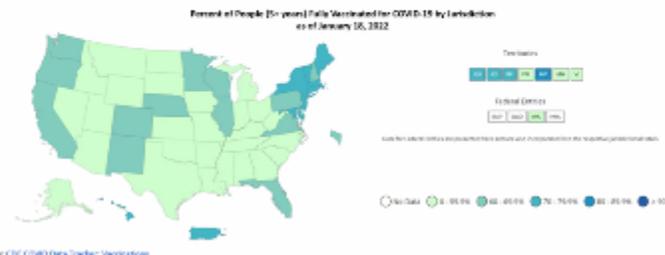
Looking Ahead

- Updating surveillance strategies for current stage of the pandemic (COVID-Next)
- Evaluating vaccine effectiveness and durability
- International issues, especially supporting vaccine delivery and administration
- Eventual transition of emergency response activities to home programs

Caitlyn Rivers

Center for Forecasting and outbreak Analytics (CFA); Better Data, better analytics, better response

Problem Statement
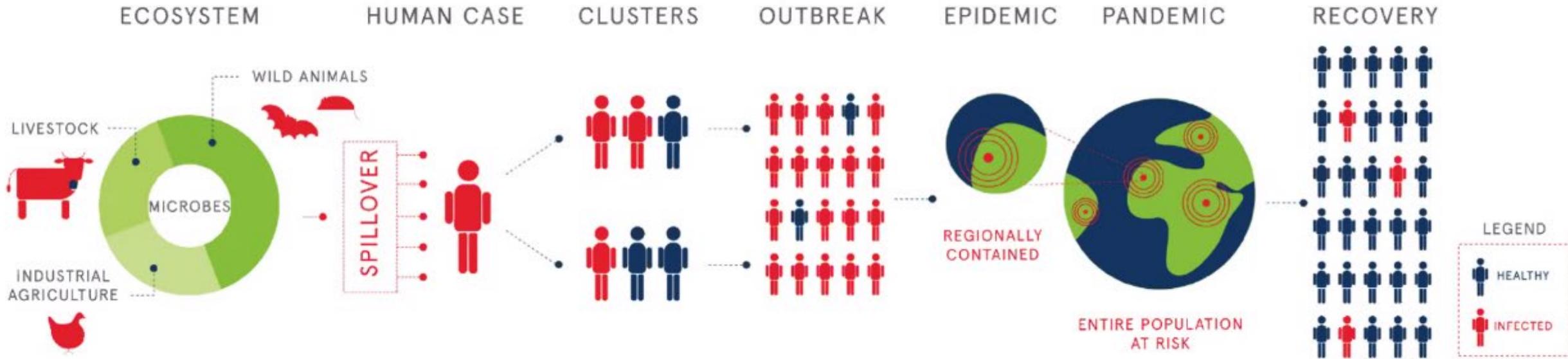
Data for Action in a Pandemic

Disease outbreaks are becoming more frequent and more disruptive.

The nation lacks data, analytical systems to identify and respond quickly, effectively.

The U.S. must improve these systems and develop capabilities for producing forecasts and analytics that leaders can use to make timely, informed decisions about how to best prepare for and respond to infectious disease threats.

Models and analytics need to be responsive to concerns of underserved communities, and address issues of health equity directly.

Analytics Inform Response Efforts Across an Epidemic

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

WILD ANIMALS

LIVESTOCK

MICROBES

SPILLOVER

INDUSTRIAL AGRICULTURE

REGIONALLY CONTAINED

ENTIRE POPULATION AT RISK

LEGEND

HEALTHY

INFECTED

Examples of Outbreak Analytics

1. Predict
2. Inform
3. Innovate

| 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 |

Draft / Pre-Decisional

# Real-time Epidemic Preparedness and Response

- Need to assess risk, prevent, and control now

- Data are delayed, diverse, and imperfect

- Models can help synthesize and contextualize data

- Communication of results is critical to action

https://www.cdc.gov/chikungunya/modeling/index.html
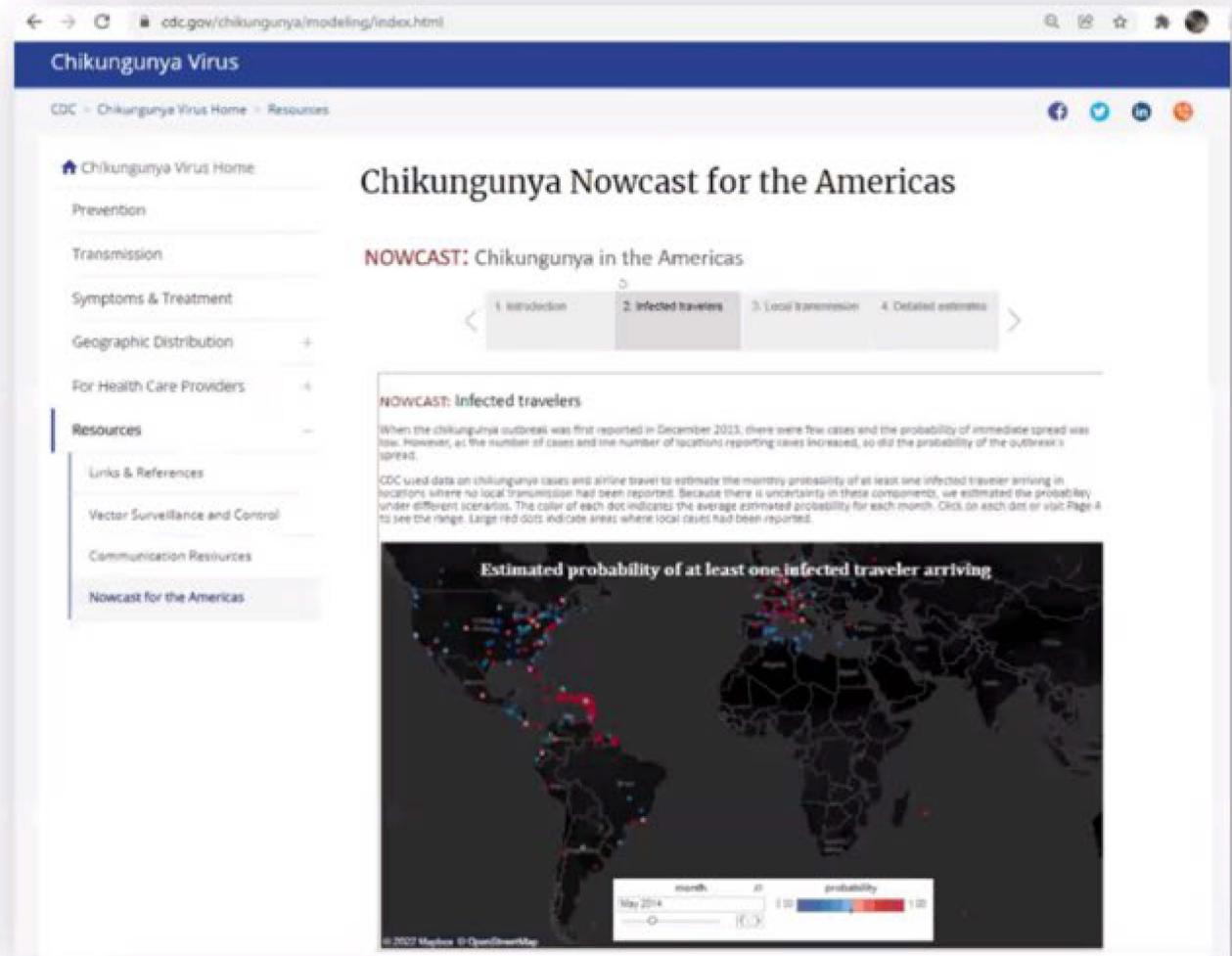
Public Health Analytics & Modeling Fellowship

- Prevention Effectiveness Modeling Track

- 2-Year commitment

- Learning-through-service model

- Competency-based curriculum

- Supervisor and separate mentor guidance

- "Community of Practice" of CDC modelers

- Seminars and inquiry groups

- 20+ Fellows in inaugural class (2021-2023)
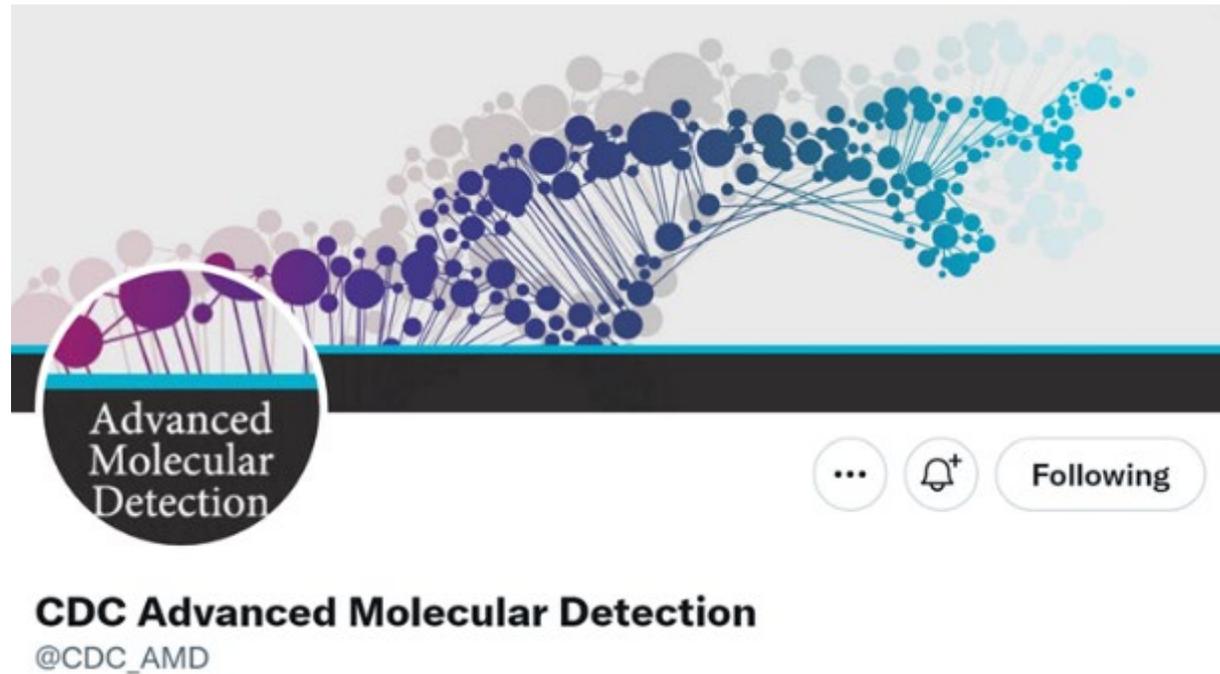
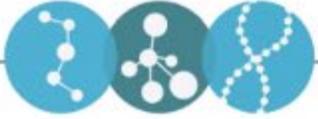https://www.cdc.gov/pef/analytics-and-modeling/index.html

Greg Armstrong

Brief History of AMD Program

- Est., FY 2014 x Congress, $30 million/year
- Objective: bring pathogen genomics and related technologies to US Public Health System (CDC and state level)

- Innovation in wet laboratory and dry pipeline sectors
- Workforce development
- Computing capacity

Greg Armstrong

The AMD Program: Progress before 2020

Sequencing @ CDC

- Nearly all ID areas
- Specific focus: MTb, flu foodborne
- 60 bioinformaticians
- OAMD managed scientific computing Ctr of excellence
- OCIO managed production environment
- Began movement toward cloud

- Insufficient access and capacity, and workforce capacity and education needed, so
- Academic collaborations via Broad Agency agreement (BAA)

State and local

- All state laboratories had sequencing capacity (PulseNet orgs mostly)
- ≥ 7 regional or state Bioinformaticians
- Workforce development/curriculum began for
  - Laboratory scientists
  - Epidemiologists
- Quality practices and some academic collaboration
- Inconsistent access to high performance computing

CDC

- SPHERES initiative, 4/2020
  - Coordination calls, 200 organizations
  - 29 BAA awards
  - NS3 Program (National SARS strain Surveillance)
  - COVID-19 Epidemiology tool kit (cdc.gov/amd)

State Genomics Capacity

- SPHERES in some

- 6-yr plan

- $240 mill 5/21 for 3 yrs

- $175 mill for construction

- National bioinformatic infrastructure

Greg Armstrong

American Rescue Plan (ARP)

Epidemiology and Laboratory Capacity (ELC) HAI/AR Program Funded Activities | HAI | CDC

Gov't funding

- $1.75 billion for sequencing
  - Accelerate SARS-CoV-2 sequencing
  - Expand capacity ($1 bill)
  - Build US capacity for pathogen genomics and bioinformatics ($300 mill)
  - Innovation ($400mill)

ARP Funding

- Sequencing thru 9 contract laboratories, 35K/week
- NS3 1500/2 weeks with live virus available
- State and Local Dec 2020 w additional funding 1/21
- Some via BAAs
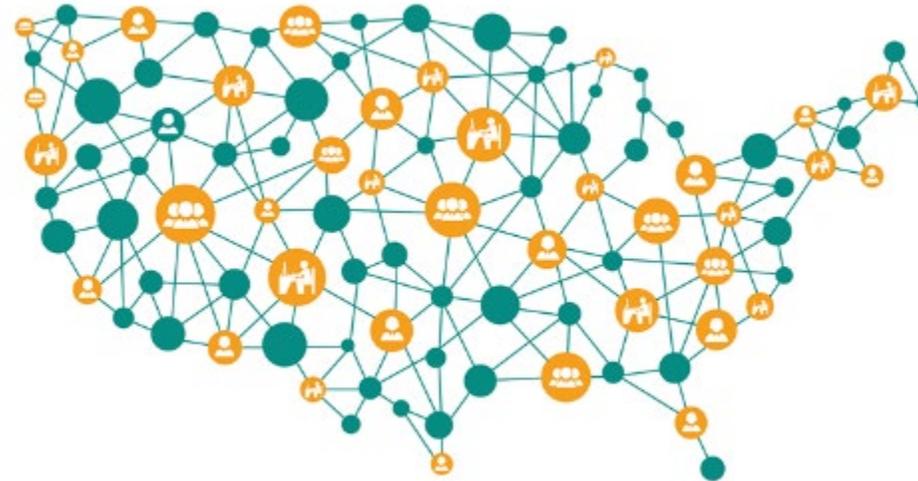 - 50% contract laboratories
  - 25% state/local
  - 25% other

Thank you

Office of AMD
Gregory Armstrong, Director
Duncan MacCannel, Chief Science Officer
Melissa (Missy) Olsen-Rasmussen, Manager
Nathelia (Tiki) Barnes, State and Global Engagement
Elizabeth Neuhaus, Platform Development
Scott Sammons, Scientific Computing

cdc.gov/amd
@cdc_amd

The findings and conclusions in this presentation are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Tim Jones

CDC Modernization of Enteric Surveillance

https://www.cdc.gov/ncezid/dfwed/edeb/index.html

Enteric Surveillance is at Risk by Culture-independent Diagnostic Tests (CIDTs)
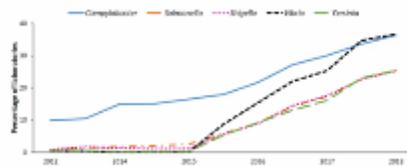
Public Health Areas at Risk

- Detection and investigation of outbreaks
- Case-based surveillance/source attributions
- Antibiotic resistance monitoring
- Screening for return to childcare, food services, etc.

Clinical Labs are Using More Culture-Independent Diagnostic Tests (CIDTs)

Action Plan

- Short-term
  - Maintain org viability
  - Expedited isolate recovery
  - Reflex testing and reimbursement strategies
- Long-term
  - Culture independent advanced pathogen characterization deployable to PHLs
  - Extraction protocols
  - Highly multiplexed amplicon sequencing (HMAS)
  - Fluidigm Juno and Illumina MiSeq
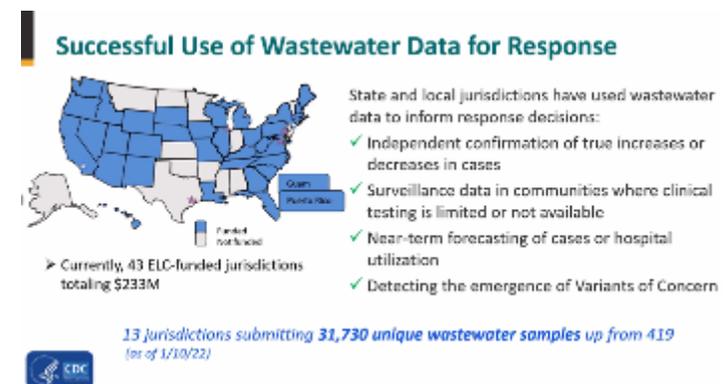 - Bioinformatics pipelines

Potential Future Topics

Issues

- Climate change and surveillance
- Health equity
- One Health clinical/animal/food and food distribution systems or home or cottage foods
- Virulence and biomarkers
- AMR genes in food
- Eliminating strains (recur, emerge, or persist)

Infrastructure

- SAR-CoV-2 approach applies to other pathogens
- Modernization and integration
- Surveillance networks including clinical partners
- Integrations w EHR

Successful Use of Wastewater Data for Response

State and local jurisdictions have used wastewater data to inform response decisions:

✓ Independent confirmation of true increases or decreases in cases
✓ Surveillance data in communities where clinical testing is limited or not available
✓ Near-term forecasting of cases or hospital utilization
✓ Detecting the emergence of Variants of Concern

➢ Currently, 43 ELC-funded jurisdictions totaling $233M

13 jurisdictions submitting 31,730 unique wastewater samples up from 419 (as of 1/10/22)

Dan Jernigan

Data Modernization Initiative: An Urgent Need to Modernize

CDC

PUBLIC HEALTH
DATA MODERNIZATION
INITIATIVE

CDC.GOV/BUDGET/FACT-SHEETS

AN URGENT NEED TO MODERNIZE

https://www.cdc.gov/surveillance/index.html

What is the problem we are trying to solve?

Siloed information:
Disconnected and/or proprietary disease systems driven by disease-specific budget lines keep us from seeing the complete picture

Outdated skills:
The public health workforce needs training to use today's technologies more effectively

Heavy burdens for providers:
Providers in healthcare and at health departments are burdened with sending data to many places in many ways

Older technologies:
- Most systems at health departments are not flexible, do not use cloud, and are not scalable

Public health is not a part of the healthcare data ecosystem
- Public health got left behind as federal incentives and regulations helped healthcare systems to be able to easily share data automatically in the Electronic Health Record.

Build the right foundation

Accelerate data into action

Develop a state-of the-art workforce

Support + extend partnerships

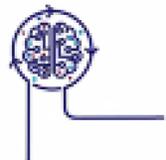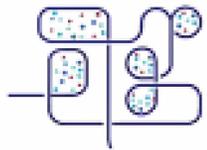Manage change + governance

We are listening and connecting.

CSTE
HealthIT.gov
CDC Foundation
astho
AEI

The ROCKEFELLER FOUNDATION
N
DATA FOUNDATION
Public Health Informatics Institute
NASDOH

Robert Wood Johnson Foundation
National Network of Public Health Institutes
THE KRESGE FOUNDATION

BIPARTISAN POLICY CENTER
digital bridge
NAPHSIS
MILKEN INSTITUTE
BIG CITIES HEALTH COALITION

HIMSS
TEXAS HEALTH INSTITUTE
PARTNERSHIP FOR PUBLIC SERVICE
Microsoft

Support with State-of-the-art workforce and Governance

What will be different because of DMI?

When the next emergency happens, we will have:

- A foundation for data sharing across all levels of public health for coordinated, scalable and timely case investigation, management, and reporting

- Shared analysis capabilities for rapid identification of trends within and across jurisdictions, including forecasting and SDOH

- A prepared data science workforce

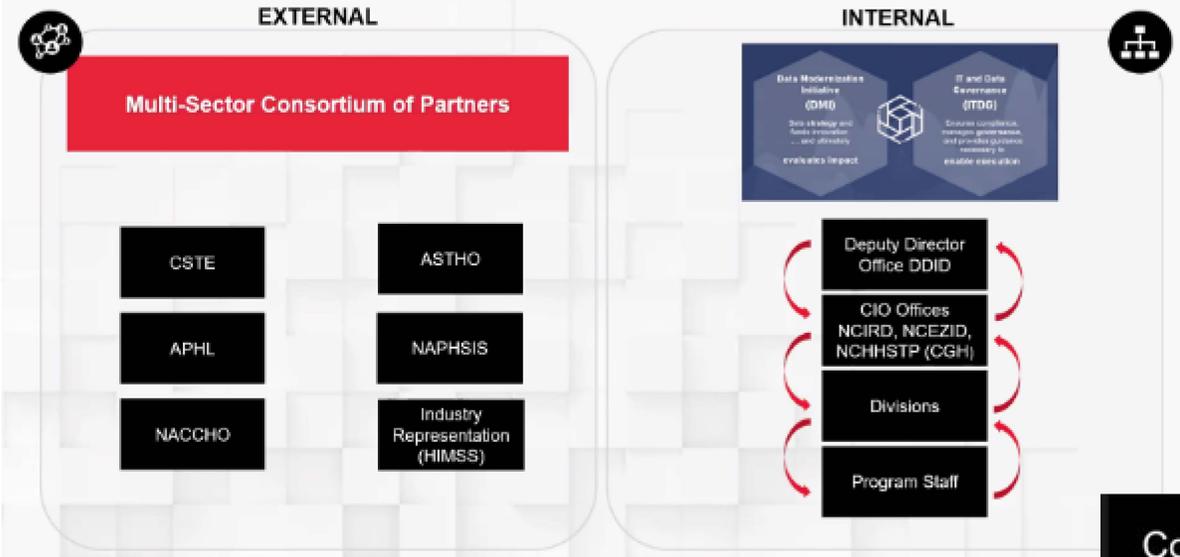- Decreased burden on data reporters and public health staff

Katie Fullerton

Data Modernization Initiative

Better Data. Better Decisions. Better Health.

https://www.cdc.gov/surveillance/index.html

We are Organizing Differently

EXTERNAL

Multi-Sector Consortium of Partners

- CSTE
- APHL
- NACCHO
- ASTHO
- NAPHSIS
- Industry Representation (HIMSS)

INTERNAL

Data Modernization Initiative (DMI) — Data strategy and funds innovation ...and ultimately evaluates impact

IT and Data Governance (ITDG) — Ensures compliance, manages governance, and provides guidance necessary to enable execution

- Deputy Director Office DDID
- CIO Offices NCIRD, NCEZID, NCHHSTP (CGH)
- Divisions
- Program Staff

Core Data Sources: Acceleration for COVID-19 and Beyond
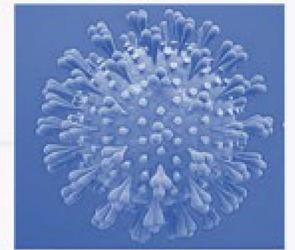
Laboratory Data Flow

Streamlined lab data from STLT health departments to CDC
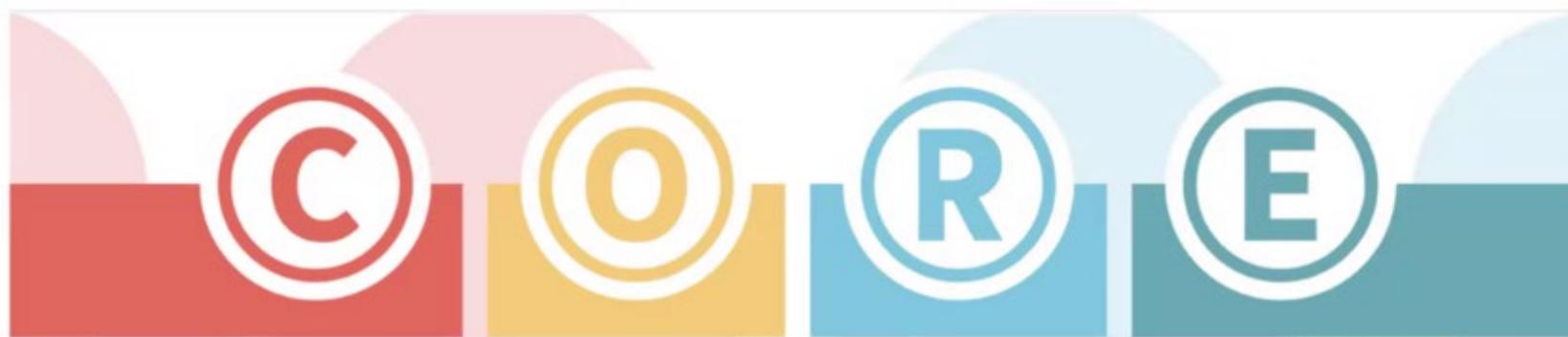
Vaccination Data Flow

Advanced pipelines to inform action

Genomic Data Flow

Tracking variants and spread of disease

CDC's Transformative Commitment
to Health Equity

January 20, 2021

Internal briefing document: Draft, pre-decisional

CDC's CORE Commitment to Health Equity

CDC launched an agency-wide strategy to integrate health equity into the fabric of all we do

C **Cultivate** comprehensive health equity science
- CDC will embed health equity principles in the design, implementation, and evaluation of our research, data, and surveillance strategies

O **Optimize** interventions
- CDC will use scientific, innovative, and data-driven strategies that address policy and systemic factors that impact health outcomes and address drivers of health disparities

R **Reinforce** and expand robust partnerships
- CDC will seek out and strengthen sustainable multi-level, multi-sectoral and community partnerships to advance health equity

E **Enhance** capacity and workforce engagement
- CDC will build internal capacity to cultivate a multi-disciplinary workforce and more inclusive climates, polices, and practice for broader public health impact

Internal briefing document: Draft, pre-decisional

Emily Mosites

Summary

- Critical areas for public health to reach people at high risk for infectious diseases

- Wide range of work to fill cross-cutting gaps

- Small team with limited funding

Special Populations: Focusing on Homeless and Incarcerated

Public Health and Homelessness Centers of Excellence

November 2021 ⟶ November 2022
San Francisco · Seattle · Minnesota

Coalition Building	Strategy development
Health departments, homeless service providers, health care organizations, academic partners	Data integration, intervention development, planning

Infectious Disease Needs Prioritization	Best Practices Toolkit
Identifying top infectious disease needs in each jurisdiction	Program-wide toolkit to share with other jurisdictions

Correctional Facility Public Health Surveillance through the National Sheriffs' Association

Challenge: Lack of coordinated data system linking correctional facilities and public health

Project Goals:

1. Enable data use within facilities for infection control

2. Increase data sharing among facilities

3. Improve public health reporting from facilities at local and national levels

The Future of the Public Health Workforce

Bridge • Build • Sustain

Pattie Simone, MD
Director, Division of Scientific Education and Professional Development

Board of Scientific Counselors, DDID, CDC
January 20, 2022

The U.S. needs to hire a minimum of **80,000** more full-time equivalents (FTEs) in state and local governmental public health departments—**an increase of 80 percent**—to provide adequate infrastructure and minimum public health services to the nation.

—*Staffing Up: Determining Public Health Workforce Levels Needed to Serve the Nation (2021)*

Workforce Development is More Than Staffing

Ensure diversity, equity, and inclusion

Recruit and retain

Hire and onboard

Workforce Development

Plan, using data and systems

Offer fellowships, pathways

Train and upskill

Bridge to Next COVID-19 Phase

Build Public Health Workforce (Disease Intervention Specialist, Public Health AmeriCorps, Internships and Fellowships

Sustain progress and invest in future

Thank you

Report to CLIAC

D.M. Wolk, MHA, PhD, D(ABMM)

April 2022