Overview of CDC and VDH Data Strategies and Data Modernization Plans

Understanding the Vision, Strategies, and Key Components

Rebecca Early, MPH, CHES /OEPI/ Director, Division of Informatics and Information Systems Anup Srikumar, MCA, /OIM/ Director, Center for Public Health Informatics

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Agenda

- CDC Data Modernization Initiative (DMI) and Public Health Data Strategy
 - CDC DMI Overview
 - CDC DMI Priorities & Vision
 - CDC Funding
- CDC DMI Overview and Current State
 - CDC DMI Priorities, Objectives & Vision
 - Agency Activities
 - CDC DMI Components
 - CDC DMI Key Projects
 - Cloud Data Repository (GCP), Enterprise Data Analytics Portal (EDAP)
 - Interoperability (FHIR), Master Person Index (MPI), Master Address Index (MAI)
- Questions



Learning Objectives

- Provide an understanding of the CDC DMI and Data Strategy
- Provide an understanding of VDH's vision for DMI
- Provide an overview of VDH's latest DMI Plan
- Provide an update regarding key components of the VDH DMI Plan





CDC Data Modernization Initiative and Public Health Data Strategy

VIRGINIA DEPARTMENT OF HEALTH



The Challenge

- National public health data systems are antiquated, siloed, and chronically underfunded.
- The COVID-19 pandemic demonstrated a need to improve the collection and use of critical health data at all levels and reduce burden on data providers.
- Challenges occurred at a broad level impacting our ability to share and use data.

CDC Data Modernization Initiative (DMI)

- DMI is a multi-year, multi-billion-dollar effort to modernize data across federal and state public health landscapes to improve decision-making.
- Vision: One public health community that works together to predict, prevent, detect, and respond to public health threats faster and more efficiently than ever before.



CDC DMI Overview

Aims to create real-time public health data and surveillance through the transformation of data systems.

Health Security

 Strengthening international cooperation and disease surveillance to protect Americans from threats like COVID-19.

Investment in Data Modernization

- Enhancing critical infrastructure to boost real-time surveillance and data sharing
- Using cloud-based tools and advanced analytics to accelerate data into action.



Workforce Development

- Investing in a state-of-the-art workforce
- Managing change and governance to promote innovative thinking and working.

Focus on Health Equity

- Tailoring strategies to diverse populations and ensuring equal access to services
- Benefitting all communities through modernized infrastructure.

Support and Extend Partnerships

• Partnering with private entities, non-profits, and academic institutions to enhance health services through innovation.



FY 2022-26

DMI Five Key Priorities



Build the right foundation

Provide a secure, scalable foundation with appropriate automated data sources to enable timely and complete data sharing, break down silos, and reduce burden on data providers

Accelerate data into action

Faster, more interoperable data provides high quality information that leads to knowledge and provides a more real-time, complete picture to improve decsion-making and protect health

Develop a state-of the-art workforce

Identify, recruit, and retain critical workforce in health IT, data science, and cybersecurity specialists to be stewards of larger quantities of data and tools to generate meaningful public health insights

Support + extend partnerships

Engage with state, territorial, local, and tribal partners to ensure transparency and address policy challenges, and create new strategic partnerships to solve problems

Manage change and governance

Support new ways of thinking and working by providing the necessary structure to support modernization and aid adoption of unified technology, data, and data products



CDC DMI: Vision



- Technology, People, Processes and Policies
- The Right Data at the Right Time
 - Most urgent and achievable goals over the next four years
 - Connected, resilient, adaptable, and sustainable
 "response-ready" systems and infrastructure
 - Real-time, high-quality data for Infectious and Noninfectious threats
 - Solve or predict problems before they happen and reduce harm when they do



CDC Data Strategy

- Strengthen the core of public health data*
- 2. Accelerate access to analytics and automated solutions
- 3. Visualize and share insights to inform public health action
- 4. Advance more open and interoperable public health data

*case data, lab data, emergency department visits, vital stats, immunizations and healthcare data.



Components of DMI and Data Strategy

	Data Modernization Initiative	Public Health Data Strategy
Scope	All-encompassing aspects of data modernization needed across healthcare, federal and STLT public health landscape.	Streamlines actions and efforts aimed at efficient and secure exchange of critical core data.
Timing	Multi-year with consistent investment	Concrete milestones over next 2 years, based on COVID lessons learned
Accountability	Many different partners, lead is Office of Public Health Data, Surveillance and Technology (OPHDST) in CDC	CDC

- DMI Strategic Implementation Plan
- <u>CDC Data Strategy</u>



Core Data Sources





Blazing New Pathways for Laboratory Data





Capturing What's Happening in Emergency Departments





Capacity to Care: How Full Are Our Hospitals?



What Data Modernization Looks Like

An

EPIDEMIOLOGIS

spending the day investigating COVID-19 cases instead of entering them into a spreadsheet



A RESPONDER

catching an uptick in overdose deaths and sending fentanyl test strips to the frontlines



A MULTI-STATE HEALTHCARE NETWORK

saving 145,000 staff hours that would have been spent on paperwork



A POLICYMAKER

using a real-time wastewater surveillance dashboard to send resources where they're needed most





What DMI Looks Like: NBS Modernization

NBS Modernization

Building a state-of-the-art integrated disease surveillance system

NBS modernization is a complex, multi-phase project. CDC will release frequent, easy-to implement updates and new features while maintaining the current system. The goal is to continuously evolve NBS to keep up with new technologies and jurisdictions' changing needs.

The Journey

Improved features gradually replace the old, and expand to include new ones.





CDC Funding: DMI in Virginia (Central Office examples)



- COVID-19 Enhancing Detection Expansion (EDX) and its predecessors
- COVID-19 Accelerating Data Modernization in Jurisdictions (ADMJ) DMI 1 and DMI 2
- Public Health Infrastructure Grant (PHIG) A3
- Epi Lab Capacity (ELC) Core Health Information Systems (HIS)
- Emerging Infections Program (EIP) (pending)
- Smaller CoAgs: Public Health Preparedness (PHEP) and other grants that support informatics and IT team members

Participation Loop: VDH and CDC

- VDH Participation in Data Modernization Workshops
- Workshops in 2023, 2022 and 2021 with latest priorities:
 - 1) sustainable funding for strengthening data infrastructure;
 - 2) ensuring STLT (state, tribal, local and territories) have a sustained, engaged, and skilled workforce;
 - 3) elevating DMI through information and resource sharing;
 - 4) developing DMI roadmaps,
 - 5) developing a shared data governance framework; and
 - 6) constructive engagement across the PHA landscape, ensuring STLT have input into CDC strategies.
- CDC's Engagement Panel for Public Health Data
- Data Modernization Learning Community



CDC Expectations (PHIG funding)

- Identify a Data Modernization Director and supporting team
- Maintain a DMI Advisory Committee
- Assess and report current capacity, gaps, and opportunities to modernize public health data infrastructure and workforce
- Create implementation plans
 - Modernization of public health data infrastructure to support work that includes forwardlooking use of flexible, scalable, sustainable infrastructure that leverages shared services and cloud-native tech
 - Workforce development
- Activities should be aligned with CDC Public Health Data Strategy, DMI Priorities and other national efforts & standards



VDH Data Modernization Initiative: Overview/Current State

CDC DMI Priorities and Objectives

Priorities	Objectives
Build the right foundation: Strengthen and unify critical infrastructure for a response-ready public Health Ecosystem. Provide a secure and scalable foundation with appropriate automated data sharing for public health action; break down silos that keep critical data disconnected; and reduce the burden on STLT partners for collecting and reporting data	 1a. Develop a shared vision 1b. Expand foundational infrastructure 1c. Modernize and connect key surveillance systems and sources 1d. Transform Legacy systems, processes, and activities 1e. Store, discover, analyze, and visualize data
Accelerate Data into Action to improve Decision-Making and protect Health. Faster, more interoperable data provides high-quality information that, in turn, leads to knowledge and provides a more real-time, comprehensive picture to improve decision- making and protect health	 2a. Increase interoperability through data standards 2b. Increase data linkages 2c. Advance forecasting and predictive analytics 2d. Implement tools for scalable response 2e. Promote health equity
Develop a state-of-the-art Workforce. Identify, recruit, and retain critical workforce in Health IT, Data Science, and Cybersecurity Specialists to be stewards of larger quantities of data and tools - Better and faster - generate meaningful public health insights	3a. Identify CDC workforce needs3b. Increase CDC data science capacity3c. Facilitate STLT data science upskilling
Support and extend partnerships. Engage with state, territorial, local, and tribal partners to ensure transparency, address policy challenges, and create new strategic partnerships to solve problems.	4a. Ensure Partner Alignment and collaboration4b. Support policies for data exchange
Manage change and governance to support new ways of thinking and working. Provide the necessary structure to support modernization and aid adoption of unified technology, data, and data products	 5a. Govern policies, planning, and resources 5b. Manage culture change 5c. Create a culture of innovation 5d. Streamline acquisition processes 5e. Evaluate DMI activities and projects



VDH Vision for DMI

- Increase interoperability of mortality data and systems
- Integrate siloed systems and data streams for better analytical capabilities
- Connect disconnected data tools and systems for scaleup during response
- Improve our ability to capture and track data on exposures and health of vulnerable populations during emergencies



History of DMI at the Agency

- 2019: DIIS established within Office of Epidemiology (OEPI)
 - Electronic Messaging (ELR, eCR, POC) Core Data Sources
 - Systems (statewide surveillance system) Infrastructure
 - Analytics and Visualization Reporting
 - Leadership and Coordinator for DMI grants and contribution to DMI
- 2021: CPHI established within Office of Information Management (OIM) and first version of DMI Plan
 - Data Governance
 - Data Analytics
 - Data Visualizations
 - Digital Accessibility
 - Leadership for DMI





Agency Activities

- DMI Director to be in place ~Jan 2024, agency resource, reports to the advisory board
- DMI Plan -
 - DMI v. 1.0: 2021: basic version
 - DMI v. 2.0: 2023: more comprehensive
 - Initial draft developed via vendor with OIM and OEPI and other inputs

Next Steps:

- Planned phase 2 with inputs from districts, additional offices and entities
- Implementation Plan and Accountability
- Assessment of sustainability
- Re-establish the Advisory Board



DMI Plan Components

- Focus Area 1: Initiation: Support, Partnerships, Workforce, Foundational
- Focus Area 2: Data Governance Processes, Tools, Data Sharing, Data Strategy
- Focus Area 3: Infrastructure Cloud Strategy, Cloud data repository, API
- Focus Area 4: Data Integration Data Pipelines, Master Data Management
- Focus Area 5: Info Security Data Security
- Focus Area 6: Data Analytics Data Visualizations, Advanced Analytics enablement





VDH Data Modernization Initiative: Key DMI Projects

Key VDH DMI Projects



Building the Right Foundation: Strengthening the core of data (lab, case and investigation data); Development of a DMI Implementation Strategic Plan, Establishment of the Google Cloud Repository and the Enterprise Data and Analytics Platform (EDAP), maintaining core



<u>Accelerating Data for Action</u>: Pilot projects using the FHIR Fast Health Interoperability Resources) data transmission protocol, increased data linkages via the MPI (Master Person Index) and MAI (Master Address Index) projects; enhanced analytics; electronic test ordering and reporting



Developing a State-of-the-Art Workforce: The Data Training Manager in the CPHI (Center for Public Health Informatics) acts as the liaison for assessing the data related training needs of the agency staff and has implemented key training initiatives like DataCamp, Digital Learning Collectives and increasing the data science capacity of the agency.



Supporting and Extending Partnerships: Pilot projects for enhanced and timely data exchanges with local health district partners and external stakeholders (the Data Trust environment).



Managing Change and Governance: As part of the EDAP project, the Data Governance team in the CPHI has established numerous processes to streamline and govern data across key data domains like COVID-19 and other Master Reference data assets.

Key VDH DMI Projects - Highlights

	GCP (Google Cloud Platform) Transformation	EDAP (Enterprise Data & Analytics Platform)	FHIR (Fast Health Interoperability Resources)	Building a Master Person Index and Master Address Index
Overview	 Involves establishing an agency cloud data repository to modernize data management at VDH 	 Serves as a data platform with integrated IT and data governance capabilities . Aims to enable VDH data stewards to discover curated datasets easily. 	 Boosts data transmission between Virginia and Fairfax Implements a FHIR death records exchange. Streamlines updates of death records to Fairfax Eliminates need for manual intervention 	 Aims to create record linkage strategies across public health systems.
DMI Progress To-Date	 Migrated COVID data, identified key domains for migration Classified and assigned sensitivity scores to incoming raw data Instituted data governance proc esses for GCP Developed metric assess governance level Defined criteria for critical data elements; created initial metadata template 	 Began utilizing the EDAP application on GCP for data discovery. Added business metadata to the data, including tagging owners and stewards. Implemented a simple workflow routing to facilitate data sharing. 	 Completed Initial testing for death records using the FHIR API and the STEVE API. 	 Identified two use cases for MPI in the first phase. Integrated data from four systems using Oracle for the custom build. Utilized Verato for enrichment s after person consolidation. Implemented enhancement requirements for different attributes in the Master Address index.



GCP Transformation



Objective & Inception:

- Goal: Establish an agency cloud data repository via GCP to revamp VDH's data management.
- Initial Steps: Migrated COVID data, highlighted crucial domains for transition, assessed data sensitivity, and initiated governance processes.

Benefits of Modernization:

- **Robust Data System:** Utilizing GCP offers a sophisticated and unified platform for data management.
- Enhanced Security: Sensitivity scoring safeguards crucial data, mitigating risks.
- Structured Governance: Established protocols ensure consistent data handling.
- Accessible Analytics: Integration with Big Query and EDAP advancements enhance data analytics and accessibility.

Engagement & Collaboration:

- Stay Updated: Regular communications will detail project phases, migrations, and feature launches.
- **Explore EDAP:** Engage with novel features, like API access, and offer feedback.
- Join Pilot Trials: Be part of the soft release in Q1 2024 to experience the refined EDAP.
- Collaborative Prospects: Opportunities for teams to contribute to future data domains and EDAP improvements.



Enterprise Data & Analytics Portal (EDAP)

Development Milestones:

- Q4 2023: Finalize Covid Vaccine Administration pipeline groundwork.
- Q1 2024: Soft-launch EDAP to pilot group; migrate all Covid data to GCP Big Query.
- Q2 2024: Full-scale EDAP launch for the agency.

Features & Benefits:

- Easy Data Access: Smooth data collection and quick analytics.
- Better Tools: Advanced analytics for deeper insights.
- Immediate Covid Data: Allows for quick health actions.

Get Involved:

- Try it Early: Join the pilot test in Q1 2024.
- Stay Updated: Attend regular project briefings.
- Work Together: Help integrate your datasets into EDAP.





Fast Healthcare Interoperability Resource (FHIR)



FHIR Development Timeline:

- Q2 2023: Project initiation in late February; FHIR development began in March.
- Q3 2023: Moved software development phase, focusing on a robust FHIR framework.
- Q4 2023: Phase 1 completion, laying the groundwork for Phase 2: Birth records integration.

Key Achievements & Goals:

- Innovative: First U.S. state-to-local FHIR data exchange.
- Focus: Better health outcomes using FHIR.
- Scalability: Potential expansion to other health departments.

Stakeholder Engagement:

- Stay Informed: Keep abreast of FHIR project updates for insights and possible advantages.
- **Contribute Feedback:** Stakeholder input is invaluable; especially departments eyeing the solution for future adoption.
- **Resource Planning:** Plan for project's evolving needs.



Master Person Index (MPI) and Master Address Index (MAI)



MPI (Master Person Index):

- Operational and updated monthly
- Currently incorporates 4 distinct internal data sources (VEDSS, WebVision, VIIS, Vital Records)
- Migration from on-premises database to cloud in progress
- "Dual loop" architecture insulates VDH from external changes (in effect, the "external" loops acts as both a check on internal results and an additional data source)

MAI (Master Address Index):

- In development
- Will follow similar model as MPI, with differences related to nature of data (ie form, not function)
- Will incorporate enterprise geocoding requirements and standards



Questions?

