
DATA MODERNIZATION INITIATIVE

DMI BASICS

The Why, What,
and How of Data
Modernization





WHAT IS THE DATA
MODERNIZATION
INITIATIVE?



WHY DOES IT MATTER?



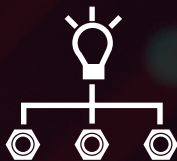
WHAT HAVE WE DONE SO FAR?



WHAT ARE OUR
GOALS?



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THEM?



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DONE RIGHT?

WHAT IS THE DATA MODERNIZATION INITIATIVE?



CDC's Data Modernization Initiative (DMI) is at the heart of a national effort to create integrated, real-time public health data and surveillance that can protect us from any health threat.

DMI is how CDC will meet its commitments to:

- » **Strengthen data reporting, management, and analytics** across public health
- » **Conduct proper surveillance** – not just of COVID-19 but also of future public health threats
- » **Support our staff** in pursuing innovation and building state-of-the-art data science skills
- » **Deliver guidance** the public can trust

It will do that through:

- » Bolstering our core “early warning” systems for real-time, linked data on emerging health threats
- » Innovating toward pandemic-ready solutions for timely and complete data reporting to CDC
- » Building a highly skilled public health workforce
- » Integrating nationwide standards for efficient, secure data access and exchange

The ultimate goal behind this initiative is to move from siloed and brittle public health data systems to connected, resilient, adaptable, and sustainable systems that can help us solve problems before they happen and reduce the harm caused by the problems that do happen.

RESOURCES

- » An Urgent Need to Modernize – This fact sheet delivers a quick look at the DMI, illustrates how investments from the CARES Act are driving and accelerating our DMI work, and addresses what it will take to sustain these efforts and achieve real change for the future.
- » Data Modernization Initiative Website – This site is the current external-facing information hub for the DMI and contains fact sheets and basic information and resources.

WHY DOES IT MATTER?

“The federal government should be **the source of truth for the public to get clear, accessible, and scientifically accurate information** about COVID-19.”

— NATIONAL STRATEGY
FOR THE COVID-19
RESPONSE AND PANDEMIC
PREPAREDNESS,
JANUARY 2021

The COVID-19 pandemic has underscored our need for data that moves faster than disease.

- » As a result, public health has reached a critical turning point – an “all hands on deck” moment when we must transform how we collect, use, and share data at CDC and beyond.

DMI will give us the ability to tap into more sources of data and to move quickly to put the pieces together on new and emerging threats, as well as to handle the complexity of the available data in a way that leads to timelier and more accurate public health decisions.

For the first time, DMI is providing a unified foundation for public health data modernization that is both resourced and comprehensive.

- » This unity is essential and is creating unprecedented connection between CDC, its partners, policymakers, and the public.

RESOURCES

- » [Harnessing the Power of Data to Save Lives](#) – This fact sheet shows the risks we face, the actions we are taking, and how we are currently putting data to work to protect America’s health.
- » [Modernizing for New and Complex Threats](#) – This fact sheet shows why we need a totally integrated, high-speed health data system to keep us safe from the diseases and outbreaks of today and the new and complex health threats of tomorrow.

**EFFECTIVE PUBLIC HEALTH MEANS EQUITABLE PUBLIC HEALTH.
DATA CAN HELP US GET THERE.**

With the Data Modernization Initiative, we are making public health data work better for America. Accurate, instantaneous data can help us pinpoint diseases from the start and direct resources where they matter most.

Data are not the end, but the means to begin answering important questions that impact our lives, livelihoods, and communities. For example, data are being used to engage communities equitably and inclusively to ensure people can ask questions and get clear, accurate information about COVID-19 vaccines. CDC and our response partners share data to help states distribute vaccines to reach all Americans.

CDC's mission is to give all people the information they need for decision-making and wellbeing. In emergencies and every day, we need data we can use to address health inequalities and give everyone the opportunity to attain the highest possible level of health. The Data Modernization Initiative is working to make important data – such as race and ethnicity data – more complete, so we can find and fix health inequality wherever it exists.



WHAT HAVE WE DONE SO FAR?

Data modernization has really accelerated this year as COVID exposed the gaps in our public health data systems in a very real and public way.

Here are a few quick highlights from what we've been able to accomplish in *just the past year*.

We've increased data sharing and integration.

- » Multiple CDC surveillance systems have extended their ability to track COVID-19.
- » The CDC COVID Data Tracker was developed in April 2020 through a collaboration between CDC's COVID-19 Emergency Response and CDC's Geospatial Research, Analysis, and Services Program (GRASP).
 - > CDC integrates data from multiple core surveillance systems into COVID Tracker interface, with the goal of making this a "one-stop shop" for COVID data.
 - > Since April, the COVID Data Tracker has received more than 140 million page views, averaging about 3-4 million a week.
- » CDC has expanded open data with 158 new datasets added to data.cdc.gov in 2020 – a 19% increase from 2019.

We've reimagined what our core surveillance systems could deliver.

- » The pandemic drove huge leaps in electronic case reporting (eCR), with thousands of healthcare facilities now exchanging automated, real-time health information (watch a video).
 - > All 50 states, D.C., and 11 large local jurisdictions are now capable of receiving COVID-19 electronic case reports, up from only a handful of jurisdictions in late 2019.
- » The National Vital Statistics System expanded its modernization community and began delivering provisional COVID-19 death data and new data on excess deaths.
 - > CDC also continues to expand reporting of death data by race and Hispanic origin to inform the COVID-19 response.



- » We have dramatically improved the quality of laboratory report data received by public health through nationwide use of standardized messaging with Electronic Laboratory Reporting (ELR).
 - › In record time, we went from zero jurisdictions reporting lab data directly to CDC to 56 jurisdictions reporting over 300 million COVID test results since last April.
- » We're capturing more early warning signals from systems that track emergency department visits and notifiable diseases.
 - › Recent innovations have brought completeness of race information in syndromic surveillance to 91%, up from 80% in 2019.

We've teamed with partners to unleash innovation.

- » This fall, CDC and the U.S. Digital Service began piloting pandemic-ready systems at state and local health departments on the frontlines of the COVID response. A new app in the pilot phase, called SimpleReport, saves frontline responders time by automating tracking of COVID testing.
- » CDC and five other large federal agencies stood up an experimental data project to track mental, social, and economic health during the pandemic. And we expanded data-ready innovation with Georgia Tech Research Institute.

Training opportunities ramped up for a state-of-the-art data science workforce.

- » A new Data Science Upskilling program offers team-based and project-driven opportunities for CDC staff from all disciplines to develop or build data science skills.
- » To keep CDC at the forefront of innovative, data-driven public health solutions, the Future of Work for Data Scientists creates an online space where managers can find tools for hiring data scientists.
- » CDC's Data Academy delivers a one-stop source to help users of all experience levels learn about enterprise data analytics and visualization tools.

RESOURCES

- » DMI - Notable Milestones | CDC – This infographic shows some of the key advancements in our progress.
- » Additional stories and blogs about Data Modernization at CDC



HOW DID WE GET HERE?

DMI was years in the making and is a result of sustained effort from CDC and its partners.

- » It follows and expands on CDC's Surveillance Strategy, which made significant progress on core surveillance systems but lacked the funding and resources we needed and was limited in scope.
 - > The Surveillance Strategy opened the door for much of the work being done today.
- » At the same time, complex emergencies like opioids and vaping were already exposing dangerous gaps in public health capacity and infrastructure.
- » Critical partners including the "Data: Elemental to Health" partners – CSTE, APHL, HIMSS, NAPHIS – along with key partners such as ASTHO, NACCHO, TFAH, and others began sounding the alarm to Congress and were essential in making the case for major, sustained investment in data modernization.

“The nation’s public health data systems are antiquated and in dire need of security upgrades - paper records, phone calls, spreadsheets and faxes requiring manual data entry are still in widespread use and have significant consequences including delayed detection and response, lost time, missed opportunities, and lost lives.”

— JANET HAMILTON, EXECUTIVE DIRECTOR, COUNCIL OF STATE AND TERRITORIAL EPIDEMIOLOGISTS

In 2020, we received dedicated modernization funding for the first time, from two appropriations:

- » \$50M in FY20 appropriations
- » \$500M in CARES Act funding



CDC engaged in an agency-wide process for determining how to maximize this investment, which included:

- » Engagement with CDC programs and partners to identify modernization needs
- » Emphasis on supporting enterprise solutions, moving away from a siloed approach
- » Consolidation of these diverse needs into core thematic areas

FY 2021 appropriation has provided CDC with \$50 million to continue data modernization activities.

The American Rescue Plan (ARP) Act provides an additional \$500 million to CDC to advance surveillance and analytics infrastructure, as well as to establish a forecasting center for emerging biological threats.



WHAT ARE OUR GOALS?

Our collective and shared vision for the future is to develop and deploy world-class data and analytics to meet today's and tomorrow's health challenges across the public health community.

- » To achieve this vision, we must be open to new ways of collecting data and orchestrating the flow of information across all levels of public health, not just CDC.

An important concept behind our vision is that modernization is not just about technical upgrades.

- » It's making sure that those of us responsible for protecting health can access the **right data** at the right time, **manage** those data, and that we and others can **use the data** to answer urgent policy questions and **make the right decisions to save lives.**

We need to ensure that our investments in data modernization are driving toward three overarching objectives:

- » Seamless reporting to public health
- » Interoperability among core public health surveillance systems
- » Supporting cross-cutting upgrades, such as migration to the cloud and access to new data sources

"In public health,
we can't do
anything without
surveillance.

**That's where
public health
begins."**

— DAVID SATCHER, MD,
PhD, DIRECTOR, CDC
1993–1998

These investments will lay the groundwork wherein:

- » Systems and services funded by CDC will scale nationwide and adapt to meet evolving needs
- » We'll be better able to inform the public, evaluate health outcomes, and drive decision-making, policy, and public health response.



We need to have every system talking to each other in real time – from local communities, to states, to national and global networks – to stay ahead of whatever comes next.

- » The data we use to protect public health come from many different sources and travel through a multitude of systems from the local to the federal level and back again.
- » What's really notable here – and what distinguishes DMI from business as usual – is that we're not so much changing the "what" of this data flow – we're focused on the "how."
- » DMI is finding new ways to automate and connect this data flow at every step of the way.

Our priority with this initiative is to make sure that all the investments CDC makes today are sustainable and lay the foundation for tomorrow.

- » We are following a set of guiding principles that will lead us to sustainability by making sure everything we put into place is adaptable, transparent, extendable, secure, reusable, and aligned.

 RESOURCES

- » [The New World of Public Health Data](#) – This fact sheet illustrates the realities of the current public health data landscape and the future opportunities we have for transformation as we develop and deploy world-class data and analytics.



WHAT ARE WE DOING TO REACH THEM?

“We cannot solve
our problems with
the same thinking
we used when we
created them.”

— ALBERT EINSTEIN

With these new opportunities and resources to modernize, we’ve developed a roadmap that lays out a path from where we are now to where we need to be.

- » CDC’s DMI Roadmap of Activities and Expected Outcomes lays the plan to coordinate people and systems, accelerate data for action, and support strategic innovation.
- > The roadmap presents our vision and how we plan to achieve it; most importantly, it keeps our end goals in front of us.
- > Our investments of CARES funding are guided by the roadmap.

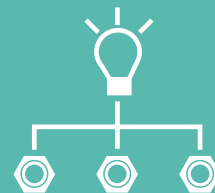
Rather than discrete, one-off projects or narrow focus on individual capacities, we have looked at the entire surveillance and data ecosystem and identified the areas most in need of investment and modernization.

- » While COVID is the priority, the end goal of DMI is to create lasting, adaptable solutions that will make public health more responsive and resilient in the future.

The CARES Act provided a huge push to accelerate modernization and DMI in particular.

- » We are being good stewards of this funding by creating investments that are both meaningful and sustainable for COVID and beyond.

OUR CARES ACTIVITIES ARE CENTERED AROUND THREE OVERARCHING THEMES:



Theme 1

Data Sharing Across the Public Health Ecosystem

focuses on getting data to all levels of public health as smoothly and seamlessly as possible and also includes further upgrades to the core surveillance systems.

Theme 2

CDC Systems and Service Enhancements for Ongoing Data Modernization

focuses here at CDC and is how we're laying the foundation needed for cloud, machine learning, artificial intelligence, and other forms of advanced analytics.

Theme 3

New Standards and Approaches for Public Health Reporting

focuses on new standards and approaches that will give public health agencies access to richer data.



HOW ARE WE MAKING SURE THIS GETS DONE RIGHT?



“Monitoring
and
evaluation
seek to
**improve,
not just
prove.”**

— M.Q. PATTON

A key difference is that DMI is supported in ways no other strategy has been before. We are not doing this alone.

- » Our public health partners, including “Data: Elemental to Health,” were instrumental in sounding the alarm on the state of public health data before COVID and they’re working with us now to get this done.
- » We are working alongside healthcare partners, including vendors, hospitals, and others across the private sector.
- » We’ve also engaged with innovation partners across academia and research who are supporting and extending our work.
- » We have first-ever Congressional support dedicated specifically to data modernization.

Our modernization work is informed by policies and strategies that reach across the federal government.

- » On January 21, 2021, the President signed an executive order on *Ensuring a Data-Driven Response to COVID-19 and Future High-Consequence Public Health Threats*.
- » The Evidence-Based Policymaking Act lays out new requirements for data sharing, linking, and privacy.
- » The Federal Data Strategy asks us to take a hard look at the data lifecycle and to identify gaps that need to be closed to make the most of our data assets.

As part of our innovation process, we are engaging in rapid prototyping and real-world testing of new solutions.

- » All solutions are informed by guardrails that are already in place, such as data standards and policies that impact how data can be collected and shared.

We have put internal structures in place at CDC that will assure and monitor progress.

- » This includes a new approach to IT and data governance that enhances the approval of strategic and efficient IT and data investments.



As we make investments and build for the future state, we are monitoring and evaluating solutions using our strategic roadmap as a guide.

- » This will help us see, as early and quickly as possible, the extent to which proposed solutions will be successful.
- » It will also guide continuous improvements along the way.

Our evaluation framework measures the progress of each project toward the overall success of the Data Modernization Initiative.

- » Specifically, we are tracking how solutions help coordinate people and systems, accelerate data for action, and support strategic innovation.

RESOURCES

- » [PRIME Fact Sheet](#) – Explains how DMI will be advanced by the Pandemic-Ready Interoperability Modernization Effort (PRIME), a new multi-year collaboration between CDC and USDS.
- » [Virtual Briefing: A Roadmap to 21st Century Public Health Data Infrastructure](#) – This November 2020 briefing included testimony from experts, including CDC's Dr. Anne Schuchat, on the need for sustained investments in modernization.
- » [Public Health Data Modernization: Listening Session on Real-World Testing of 21st Century Cures Act Requirements](#) explores impending changes and what they mean for data standards and technologies
- » [2020 Federal Data Strategy Action Plan](#)
- » [Foundations for Evidence-Based Policymaking Act](#)
- » [Executive Order on Ensuring a Data-Driven Response to COVID-19 and Future High-Consequence Public Health Threats | The White House](#)

