DMI

SNAPSHOT

2021

BUILDING A STRONG FOUNDATION

CDC'S DATA MODERNIZATION INITIATIVE

CDC's Data Modernization Initiative (DMI) is the first unified, comprehensive effort to modernize core data and surveillance capabilities across the federal and state public health landscape. While it is impossible to capture the complete scope of our work, the following report delivers a snapshot of progress made in 2021.

Since the start of the pandemic, CDC and our partners have been responding in ways that will make our data timelier, more complete, more accessible, and more usable for COVID-19 and beyond. Behind these accomplishments are many thousands of people who have worked tirelessly over these long months to modernize public health surveillance and data in meaningful and lasting ways.
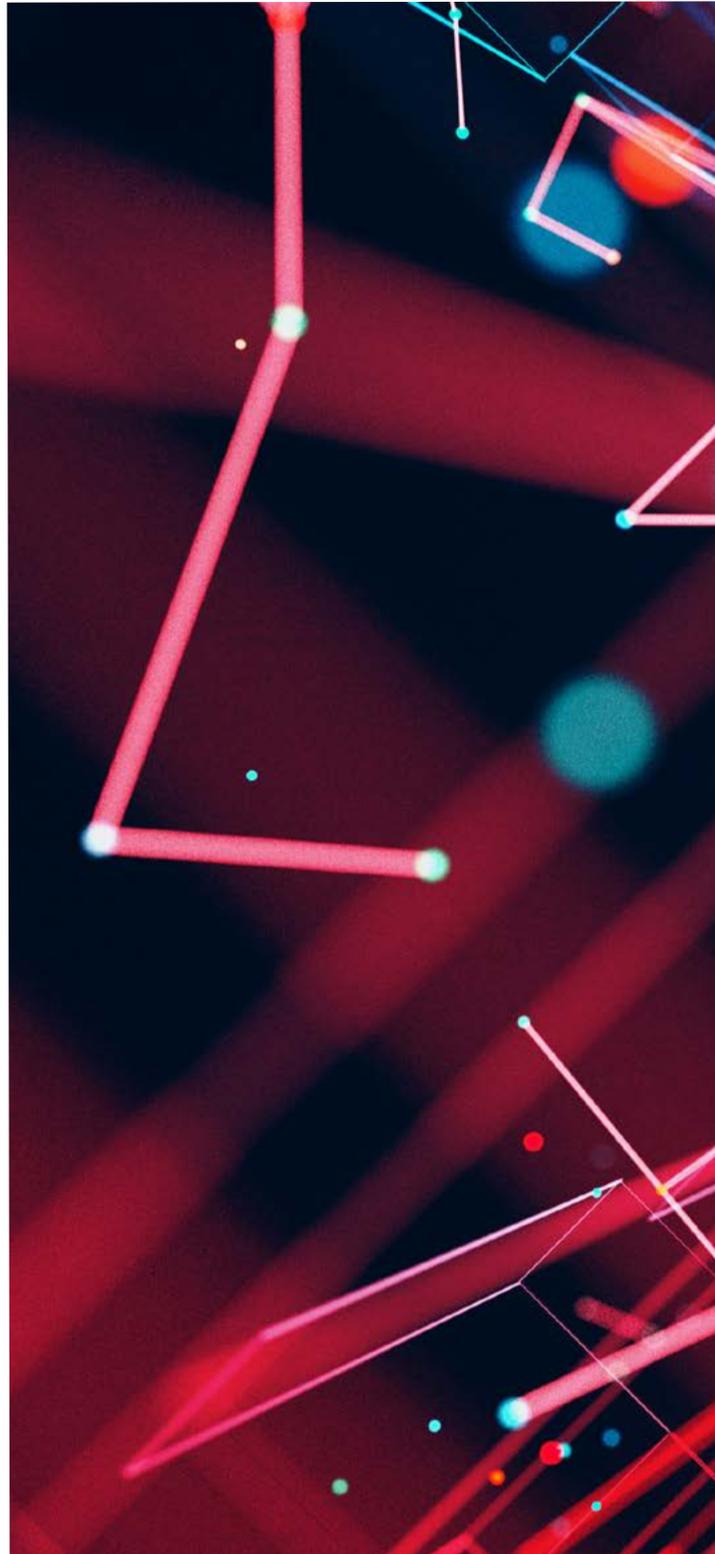
"The COVID-19 pandemic has created both the greatest need and the greatest opportunity we have ever had to modernize public health."

- DANIEL JERNIGAN, MD, MPH, DEPUTY DIRECTOR FOR PUBLIC HEALTH SCIENCE AND SURVEILLANCE AT CDC

WHY MODERNIZING PUBLIC HEALTH DATA MATTERS

The COVID-19 pandemic has underscored the need for a high-speed, modernized public health data infrastructure. When people's lives are on the line, connected and integrated data help us put the pieces together faster and take action to protect health.

Years of underinvestment in public health have led to systems that are siloed, outdated, and incompatible, and data that are delayed and incomplete. One result is that many places in America are underserved by public health. We must use the lessons learned in this moment to create systems that will help us respond to both infectious and non-infectious threats—and improve the health of all people.

WHAT WE'RE DOING

We continue to answer the demands of the pandemic while making our data ready for whatever comes next.

At the federal level...

We're unifying our data at CDC and supporting policies that make data sharing easier.
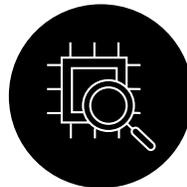
At the state and local level...

We're building up our public health workforce and strengthening connections for timelier, more accurate data.

For the public...

We're supporting equitable health and providing more real-time data for decisions.

MODERN

IN 2021,

DMI MADE STRIDES
ON FIVE KEY
PRIORITY ACTIONS
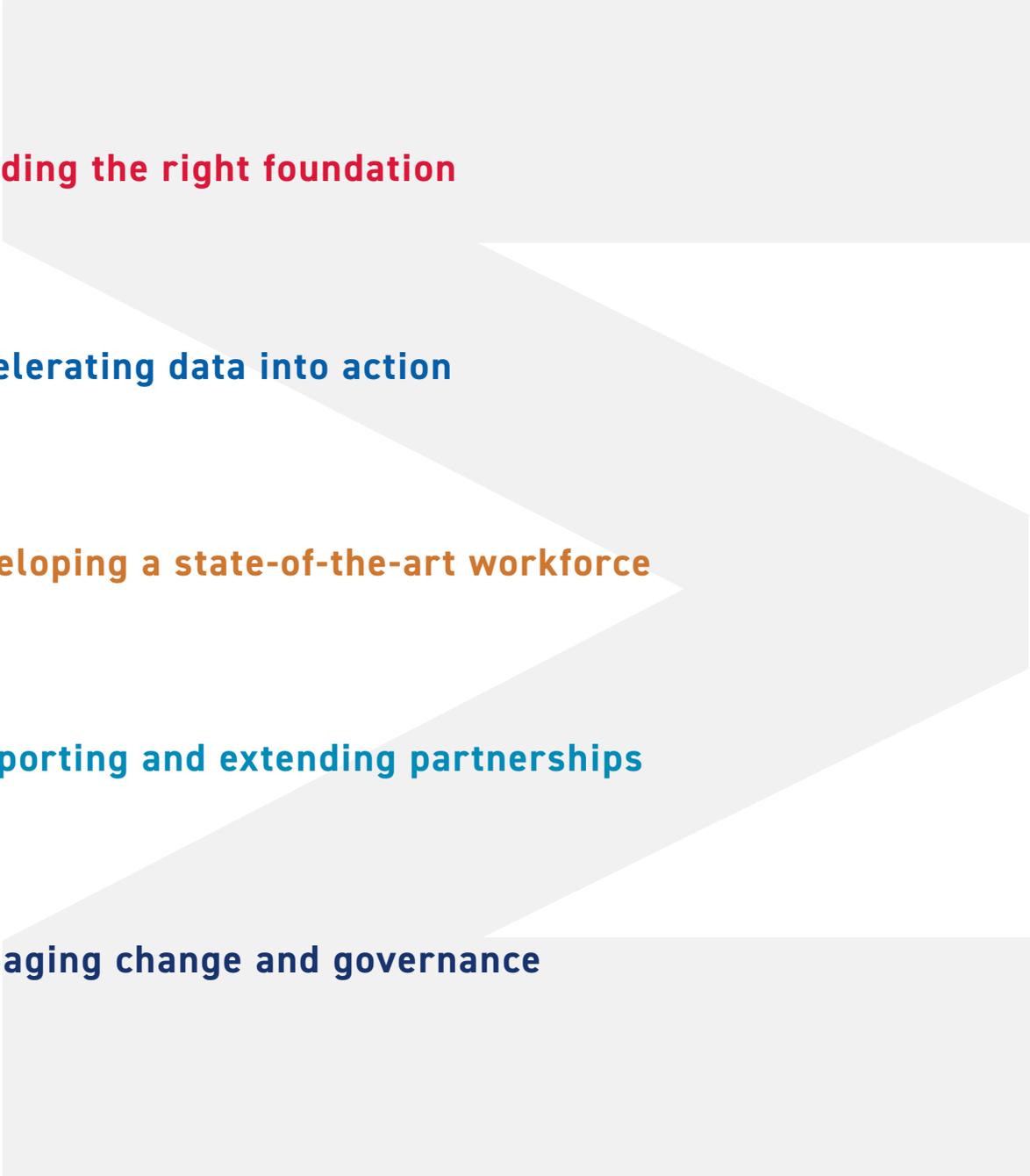
1 Building the right foundation

2 Accelerating data into action

3 Developing a state-of-the-art workforce

4 Supporting and extending partnerships

5 Managing change and governance

⬡1 BUILDING THE RIGHT FOUNDATION

In 2021, we improved data collection, analysis, and sharing at CDC and focused on a set of core public health surveillance systems that are used for all diseases and conditions.

REAL-TIME DATA COLLECTION >
We created new pathways for surveillance data to flow seamlessly between jurisdictions and CDC, collected more demographic data, and increased the number of laboratories and health departments who are connected.

CLOUD-BASED SERVICES >
We moved more of CDC's data securely into the cloud to streamline the way we process, store, visualize, and share it.

AUTOMATION >
We automated more data from critical sources like electronic health records and death certificates to allow hospitals and other data providers to begin "turning off their fax machines."

STATE AND LOCAL CAPABILITIES >
We answered state, local, tribal, and territorial needs through a mix of funding and technical support, and by identifying dedicated data modernization leads in every jurisdiction.

DID YOU KNOW?

Core systems include systems that conduct surveillance for:

CASES AND ILLNESSES

DEATHS

LABORATORY TEST RESULTS

IMMUNIZATIONS

MOVING THE DIAL

1.5M Per day

COVID Electronic Laboratory Reporting (CELR) opened a new pathway for test results to flow directly from jurisdictions to CDC. By late 2021, this system was delivering more than 1.5 million results per day, alerting public health to changing disease levels and the areas and populations most affected.

$6.5M Saved

In its first year of operation, CDC's new cloud-based enterprise data, analytics, and visualization (EDAV) platform saved CDC millions by offering a single, reusable platform that programs can use instead of building individual systems, while also allowing our scientists to catalogue, analyze, and publish findings faster than previously possible.

187 >> 10,200 Facilities

Through CDC's massive expansion of electronic case reporting (eCR), by the end of 2021, more than 10,200 healthcare facilities in all 50 states were sending case information from their electronic health records to state and local health departments, up from just 187 before the pandemic.

2 ACCELERATING DATA INTO ACTION

In 2021, we tapped into more data sources, promoted health equity, and increased capacities for scalable outbreak response, forecasting, and predictive analytics.

Deeper insights

HEALTH EQUITY > We continued bridging the gap between the data we have now and the data we need to fully understand and address the drivers of health disparities.

DATA LINKAGE > We combined traditional surveillance data with non-traditional data, such as geospatial, social vulnerability, and administrative data, to uncover disease impacts.

Fast and secure connections

INTEROPERABILITY > We continued working toward shared data standards, such as FHIR, that connect previously disconnected data systems and created hubs for rapid, bidirectional data exchange.

PRIVACY AND SECURITY > We used new Privacy Preserving Record Linkage (PPRL) technology to keep personal information protected and to safely link and share health data.

Sharing more

OPEN DATA > We provided more data directly to the public and to researchers for faster insights on COVID-19, health equity and other priorities.

COMMON OPERATING PICTURE > We built updated platforms that bring trusted, real-time data together in one place for easier analysis during an outbreak or other public health emergency.

Flexibility for the future

SCALABLE EMERGENCY RESPONSE > We increased the use of systems that can be rapidly scaled-up when needed, so that the same system can be used for 300 or 3 million cases.

FORECASTING & OUTBREAK ANALYTICS > We stood up a new National Center for Forecasting and Outbreak Analytics that will allow us to predict, inform, and innovate to fight any disease.

MOVING THE DIAL

1M+ Genome Sequences

CDC began expanding its platform for multiple respiratory illness surveillance in ways that will better prepare us for the next big outbreak, including new cloud and computational capabilities that can easily handle millions of unique SARS-CoV-2 genome sequences.

509M Records

In 2021, CDC's new immunization data lake tracked and enabled analysis of more types of data, expanded vaccine effectiveness data through the use of electronic health records, and processed more than 509 million unique vaccine administration records.

1,444 Data Sets

CDC continued to expand open data with 1,444 new data sets created and accessed on data.cdc.gov as of late 2021 — a 37% increase from the middle of 2020.

In 2021, CDC worked in close concert with state, local, tribal, and territorial partners to harmonize how important data are captured and shared between healthcare and public health.

One result is that data elements like pregnancy status, disability status, occupation, tribal status, and date of death have been prioritized for inclusion in version three of the U.S. Core Data for Interoperability (USCDI) — an important first step toward ensuring that all levels of public health can more easily access and exchange the data they need to do their work and show the impact of that work.
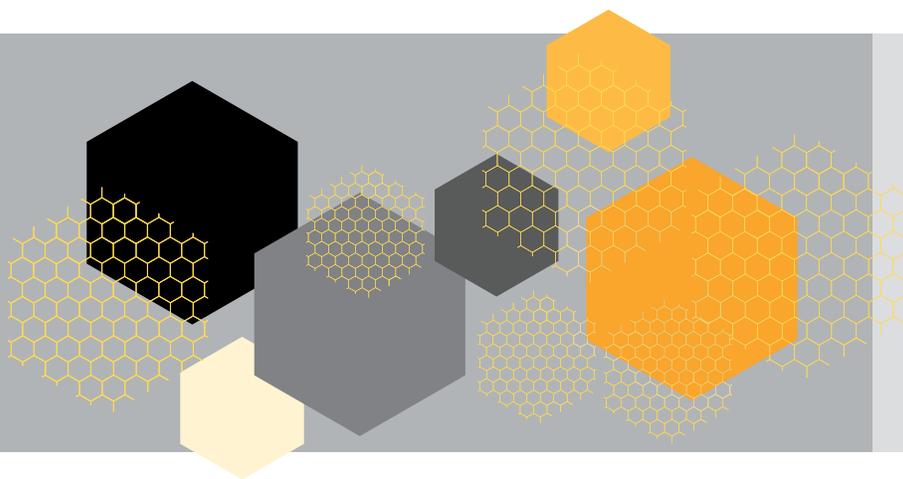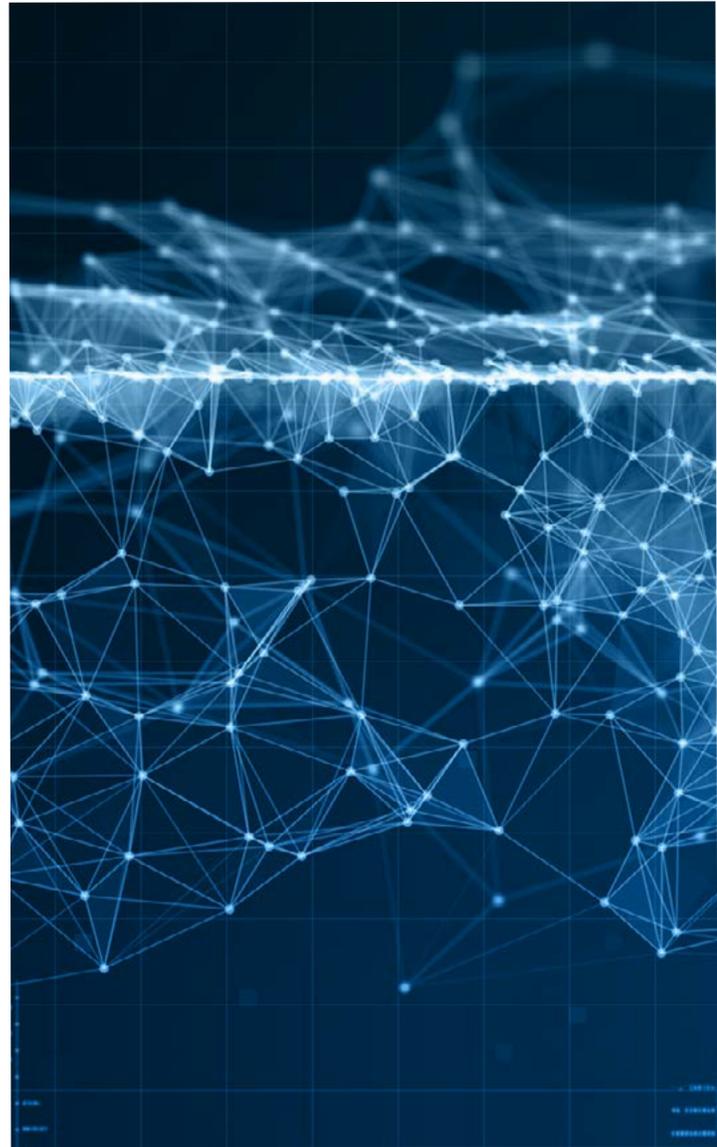
Months → Weeks

CDC has shortened the time to release preliminary mortality estimates from months to just weeks. For the first time in 2021, these estimates were released on CDC WONDER, advancing near-real time surveillance while expanding access to death data that addresses critical public health needs.

DEVELOPING A STATE-OF-THE-ART WORKFORCE

In 2021, we prioritized building a data-savvy workforce, improving our nation's ability to use next-generation skills for actionable public health insights.

RECRUITMENT >
We worked to attract a diverse, qualified public health science workforce.

TRAINING >
We continued building the skills of the current and future workforce through team-based programs and career entry fellowships.

FORECASTING FUTURE NEEDS >
We modernized and expanded the use of public health workforce data.

STATE AND LOCAL SUPPORT >
We supported our state and local partners to build a public health workforce that represents the communities in which they work.

MOVING THE DIAL

2,500+
Hours

Housed within CDC's new cloud-based platform, CDC's Data Academy provided more than 2,500 hours of training designed to help our workforce build state-of-the-art data science skills.

20
Teams

CDC funded the Council of State and Territorial Epidemiologists (CSTE) to implement Data Science Team Training in January 2021. The first cohort of 20 teams (93 learners) represented a mix of state, local, tribal, and territorial health departments.

$3B
Grant

CDC is making a major investment in expanding, training, and sustaining the public health workforce of tomorrow as part of a new $3 billion American Rescue Plan grant to help states and territories.

4 SUPPORTING AND EXTENDING PARTNERSHIPS

In 2021, we worked closely with state, local, tribal, and territorial partners, as well as with healthcare and private industry, to ensure transparency, address policy challenges, and solve problems together.

POLICIES > We worked across the federal government and with partners on policies that support the exchange and use of data between CDC, jurisdictions, partners, and data providers.

ACCESS > We increased access to our data modernization plans and progress to increase participation and alignment.

DATA USE AGREEMENTS > We increased the use of standardized data use agreements, allowing jurisdictions and partners to seamlessly access more than 1,300 datasets that enable research and inform decision making nationwide.

COLLABORATION > We worked with research and academic partners on innovative projects that streamline information flow, reduce burden on data providers, and accelerate data from the local to the federal level.

MOVING THE DIAL

64 Jurisdictions

CDC worked closely with public health partners including ASTHO, CSTE, NACCHO, and NAPHSIS to coordinate efforts and support nationwide policies for data sharing across 64 public health jurisdictions.

$200M Support

In August 2021, CDC awarded $200M from the CARES Act to eligible state, territorial, and local public jurisdictions to build foundational data capabilities, accelerate electronic case reporting, and modernize vital statistics systems.

25+ Launches

As part of the Pandemic-Ready Interoperability Modernization Effort (PRIME), CDC and the U.S. Digital Service launched innovative COVID test reporting solutions in more than 25 states and territories.

29 Measures

In December 2021, CDC released the first data update for PLACES, a collaboration between CDC, the Robert Wood Johnson Foundation, and CDC Foundation that uses small area estimates to better understand 29 key measures of chronic disease and social vulnerability at the very local level.

5 MANAGING CHANGE AND GOVERNANCE

In 2021, we ensured that resources were used wisely, monitored our progress and accountability, and supported strategic innovation for new ways of thinking and working.

GOVERNANCE > We enhanced our ability to approve strategic and efficient IT and data investments at CDC, aiding adoption of unified technology, data, and data products.

MONITORING AND EVALUATION > We measured progress on a growing suite of investments that touch nearly every part of the public health ecosystem.

PROCUREMENT > We began making acquisition processes more efficient and effective to allow CDC and its partners to get timely and flexible resources.

CHANGE MANAGEMENT > We encouraged a culture of innovation, collaboration, inclusion, and adaptability among CDC and its partners.

DMI is building bridges to more partners than ever before.

MOVING THE DIAL

$16M
Saved

Unified IT and Data Governance has saved CDC approximately $16 million by preventing the creation of duplicative systems and connecting programs to existing systems that meet their needs.

2x
Innovation Teams

CDC and Georgia Tech Research Institute (GTRI) applied innovative approaches to common public health data challenges, more than doubling the number of project teams as of 2021.

60
Projects

CDC is monitoring 60 DMI projects and 232 activities through the Data Modernization Initiative Evaluation Hub, ensuring accountability for our investments and allowing for continuous improvement.

Where we're headed

During the <u>second year of the COVID-19 response</u>, we showed that modernization is possible, that these capabilities are within reach, and—importantly—that we know how to get there. We must now apply the lessons learned in ways that help us address longstanding issues like health equity and prepare our nation for the next infectious or non-infectious threat.

The <u>Data Modernization Initiative Strategic Implementation Plan</u> lays out our key priorities and objectives for reaching the future state of public health data. In 2022, we will focus on connecting more formally with our external partners and on developing a "north star" data architecture that will allow information to flow more seamlessly between CDC and our state, local, tribal, and territorial partners.

We will also focus on the policies that guide how data are shared across public health. For example, we are looking at how we will move beyond the public health emergency in ways that break down silos, strive for disease-agnostic approaches, and apply common standards to make more data available across the multitude of systems our nation relies on for answers.

BEYOND OUTBREAKS:
Modernizing non-infectious disease data Modernization is not just for outbreaks and pandemics. Better data on non-infectious diseases and conditions — birth defects, cancer, opioids, suicides, and more — are critical to our nation's wellbeing.

WHAT WE'VE LEARNED FROM OUR EXPERIENCE IS THAT:

Data modernization is integrative.

Electronic, automated data is an important first step toward creating a true and complete picture of health in America, but there is much more to be done in terms of bringing together information for action. Only when the right policies and agreements are in place, when data can flow seamlessly through our systems, and when many data sources can be brought together quickly and easily will we begin to truly have the insights we need. We must also bring public health and healthcare together so that we are working as one public health community.

Data modernization is iterative.

There is not one single solution or technology that will solve the longstanding problems faced by public health. What data modernization must offer are building blocks that we can improve upon as we go. We need tools that are flexible and scalable to handle the multitude of challenges we face today and capable of changing in response to an uncertain future. We need to recognize that modernization is not a one-time event, but a willingness to continue taking on the hard problems and challenging ourselves to do better.

Data modernization is innovative.

Driving all this work forward is a vision of what public health can and should be: cutting-edge, high-speed, and nimble in the face of change. We will need to think beyond fixing gaps and catching up if we are to realize the true possibilities of our data. Through modernization, we envision a future in which public health is not only "response-ready" but also more equitable and better at promoting meaningful wellness for all people in America.