Future State Story and Moments that Matter

Case Service Design | September 2025

Overview of Case Service Design

Case Service Design (CSD) is a multi-year, human-centered initiative

The goal of this initiative is to create and coordinate complete solutions that help public health organizations easily and securely share case data among state, tribal, local, and territorial (STLT) jurisdictions, health departments, partners, and CDC.

Holistic Design

Solves systemic problems and connects siloes across state, tribal, local, territorial and CDC

Human-Centered Approach

Puts the public health workforce at the center of the design process

Data for Public Health Action

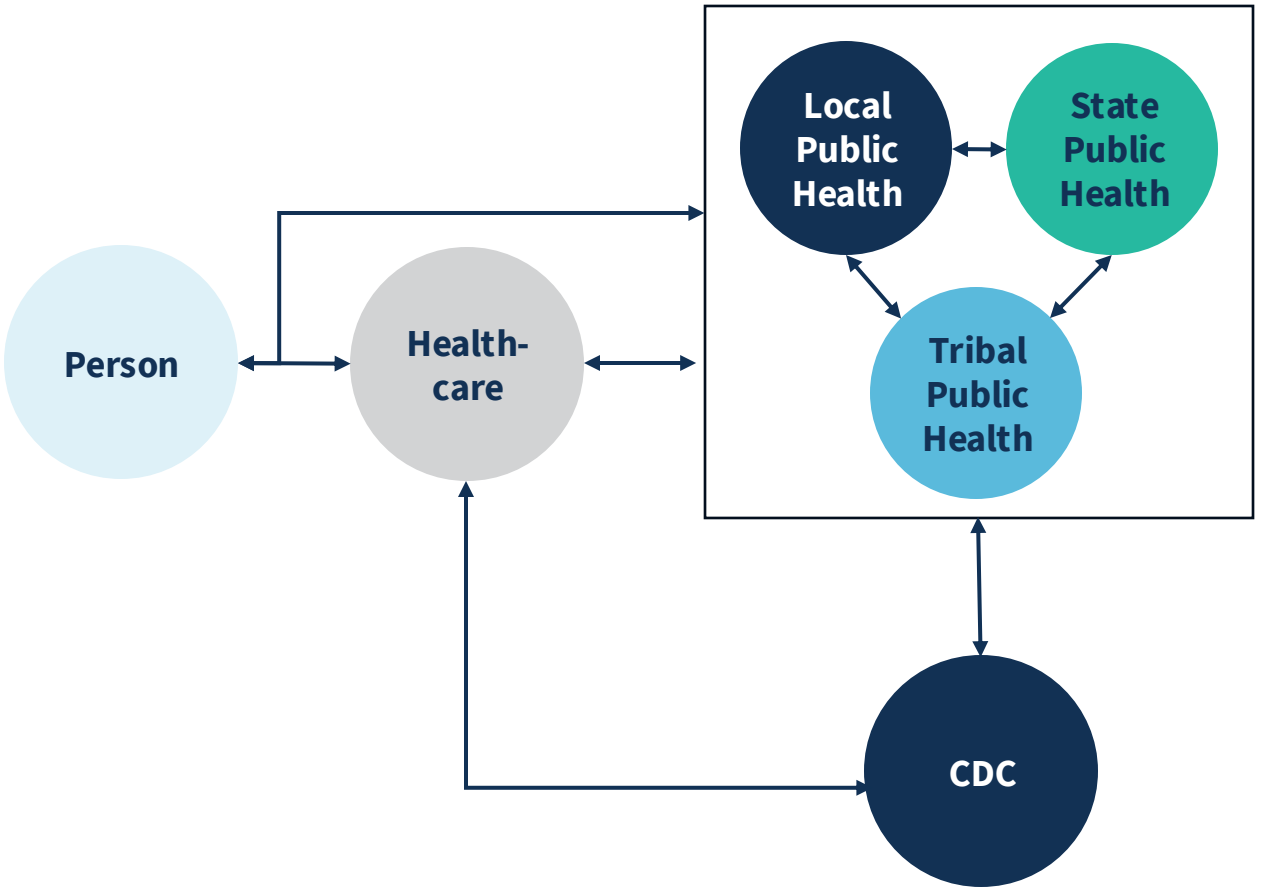
Ensures easier access to the data you need when you need it

Designing the Future State

Informs the evolution of the Public Health Data Strategy

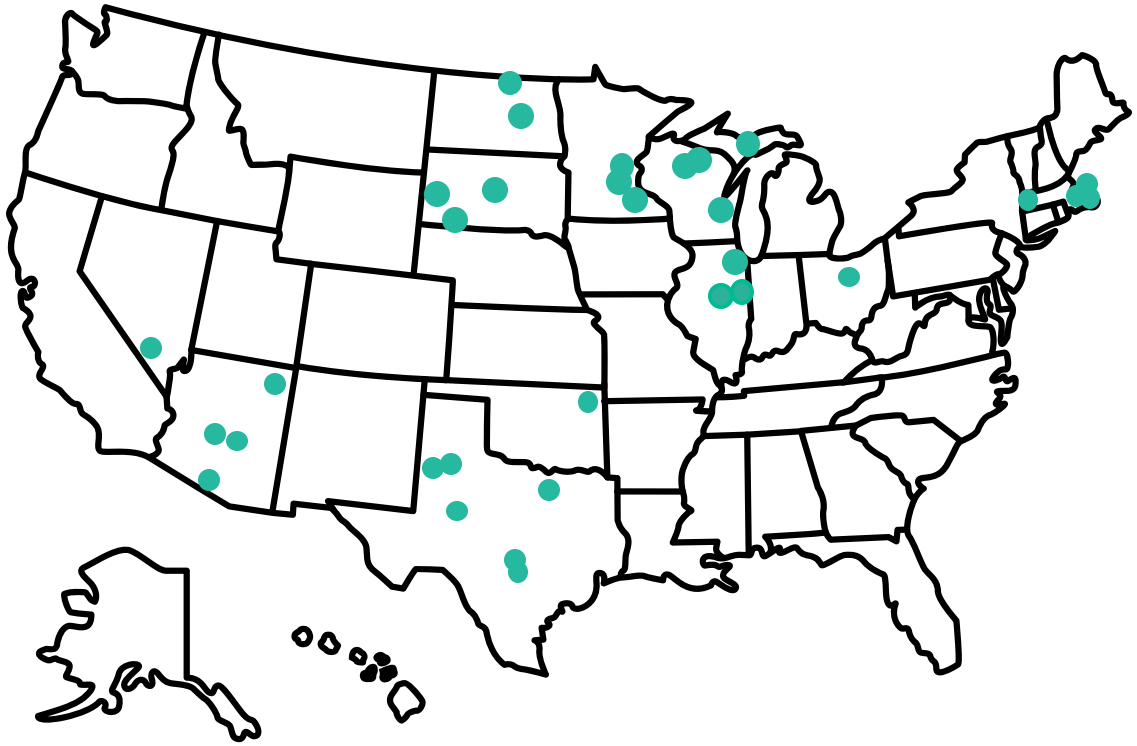
Collaboration bridges technical gaps along the data chain

- Data chains represent the flow of information among people, healthcare, and public health entities.
- Effective public health action is possible when all parties along the data chain have clear roles and active participation.
- Deep collaboration prevents breaking the data chain and helps coordinate investments and responsibilities.



An earnest and candid workforce taught us today's realities

32 Jurisdictions: 8 states, 5 tribes, 17 localities, and 2 Tribal Epidemiology Centers



Visits from April to December 2024

- **Internal interviews** with program practitioners
- **External interviews** with jurisdiction practitioners
- **Focus groups** with health systems and providers
- **Ongoing feedback** from national public health partners and federal partners
- **In-person workshops** where public health professionals within each group designed the future state together

Together in August ‘24, we created a future vision for data exchange

Over **100** epidemiologists and data scientists from:

- **25** state, local, and tribal jurisdictions
- **11** public health partner organizations
- **7** CDC centers, institutes, and offices

National partners:

- Council of State and Territorial Epidemiologists (CSTE)
- National Association of County and City Health Officials (NACCHO)
- Association of Public Health Laboratories (APHL)
- Big Cities Health Coalition (BCHC)

Big Rocks are common themes we heard from participants

Manual processes

There are **too many inefficient, manual processes in the exchange of public health data** that delay action, introduce errors, and create painful experiences for public health and healthcare workforce.

Integrated systems + processes

Siloed systems block access to data, force redundant work, and strain the workforce putting accurate and timely public health action and community trust at risk.

Access to data

Public health **workers lack efficient or consistent access to critical data** creating additional manual work, gaps in actionable knowledge, and less effective and delayed public health action.

Sustainable workforce

The **lack of defined staff skills, boom and bust categorical funding, and poorly defined roles** that don't match people's actual tasks impede the ability of public health agencies to hire, retain, and train adequate and effective staffing.

Collaboration + orchestration

Lack of strategic planning, timeliness and transparency in decision making, and changing priorities have resulted in suboptimal data modernization efforts that have further eroded efficacy across an already strained PH ecosystem.

Standardization

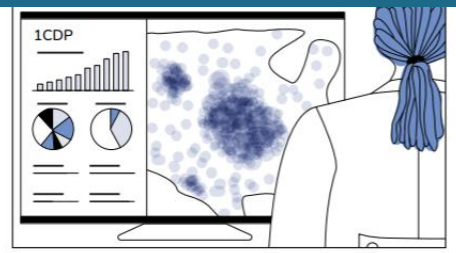
It is challenging to promote the development, adoption **and implementation of interoperability standards** across the public health and healthcare ecosystem.

We have a process to make vision into reality

VISION → REALITY

The future we want

As they are collected, data are available for analysis to guide public health action



Implement

- NBS
- 1CDP
- eCR
- FHIR

What must be true

- ☑ Automation supports data visualization and communication.
- ☑ Infrastructure is integrated and interoperable.
- ☑ Clear data standards are adopted across public health.

Define the plan and create milestones

Easy data viz on 1CDP	
NBS 7 adoption	
New notifiable disease processes	

The future *we* want!

FUTURE STATE STORY

Setting the scene for the future

In the future, public health professionals can spend their time using data for action and can work at the top of their knowledge. Integrated systems enable public health workers to have comprehensive access to the actionable data they need to do their jobs easily.

Public health data exchange is rooted in…

- Strong relationships grounded in consistent, **clear roles and responsibilities and transparency**
- Collaboration and trust between local, tribal, state and CDC to drive **data standardization, interoperability, and shared IT support**
- Clear expectations through **DUAs, policies, and guidelines**
- **Skilled workforce** to support public health's technology needs
- Appropriate **people and technology resources**
- **Seamless coordination** between healthcare and public health

and technology empowers people to…

- Detect cases and support efficient and secure information sharing between healthcare and public health
- More easily conduct case investigation and contact tracing
- Access timely data by investing in automation
- Access new and alternative sources of data
- Share data across all levels of public health through integrated and interoperable systems
- Automate data ingestion, validation, visualization, and communications

What we heard from you!

FUTURE STATE STORY

Future moments that matter with case data exchange

Stages

1. Detection

Ill persons seek health care, specimens are tested, and public health receives case reports.

2. Investigation

A case is confirmed, and the case investigator works to identify the source and stop the spread; case investigation occurs in both routine and emergent scenarios

3. Outbreak Detection

Cases are above expected number and analysis reveals unusual patterns.

4. Outbreak Investigation

Multiple cases are identified and additional investigation begins to identify common exposure; sometimes there are multiple exposure sources and sometimes it is a single source.

5. Outbreak Intervention

Public health mobilizes to stop the spread.

What we heard from you!

6. Data sharing, analysis, and dissemination

Data is shared across all levels of public health and with health care. Data is analyzed and visualized to inform decision-making and inform the public.

Future moments that matter with case data exchange

Explanation of terms

All parties

In this context it is all individuals and organizations expected and authorized to use the data. This is likely to include STLT staff and CDC program and response staff, and there might be roles for other federal agencies, healthcare providers, or others.

Core DUAs

A data use agreement between CDC and public health jurisdictions intended to simplify and streamline data sharing. It includes 1) common provisions that outline CDC responsibilities and procedures that apply across data sets, and 2) data-specific addenda that address data source-specific and jurisdiction-specific requirements.

Healthcare

Organizations, facilities, and clinicians that provide direct health care to patients

Ready-to-use data

Data that has been cleaned, transformed, and linked and is in a format that is optimized for analysis (rather than for transactions or for storage). For some users, the data may need to be aggregated or have other data suppression applied for confidentiality.

Timely data

Data that is received quickly after suspicion or diagnosis to allow public health to investigate and initiate control actions early enough to control spread. Requirement for timeliness of disease reports are specified in jurisdiction reporting laws or rules

Usable data

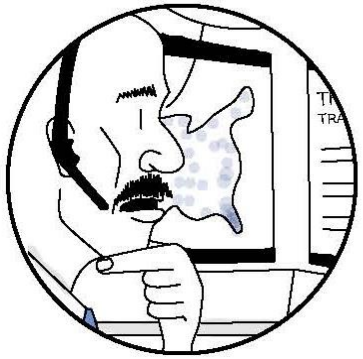
Data that is sufficiently complete and accurate and is in a format that can be easily understood by public health and easily ingested into public health data systems

Future moments that matter with case data exchange

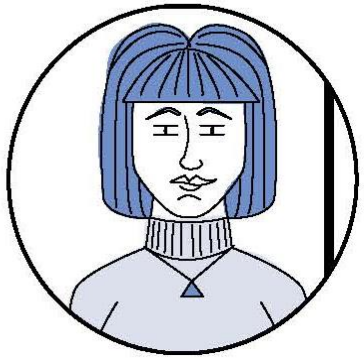
Characters

Case #1

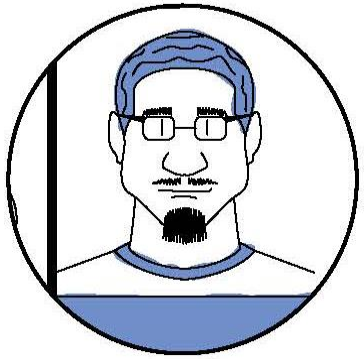
Clinician



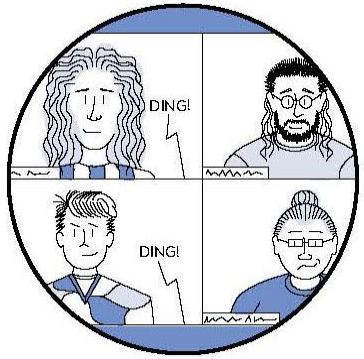
Case Investigator



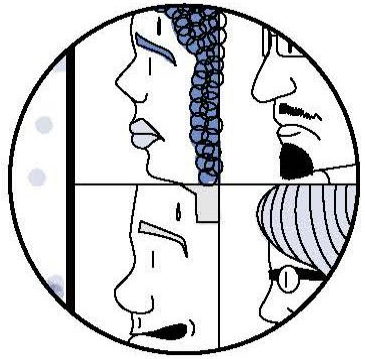
State epidemiologist



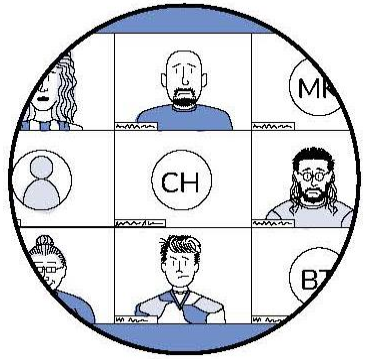
CDC program practitioner



CDC & STLT epidemiologist



Various Workers (STLT & CDC)



Various Workers (STLT &CDC)

FUTURE STATE STORY

Future moments that matter with case data exchange

1. DETECTION

Ill persons seek health care, specimens are tested, and public health receives case reports.

2. INVESTIGATION

3. OUTBREAK DETECTION

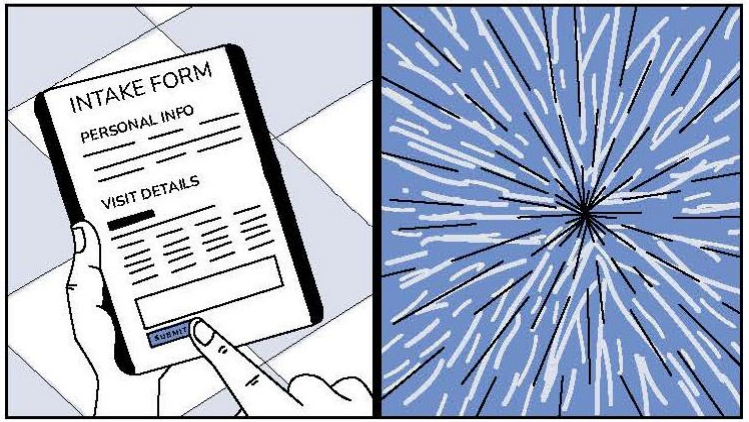
4. OUTBREAK INVESTIGATION

5. OUTBREAK INTERVENTION

6. DATA SHARING, ANALYSIS AND DISSEMINATION

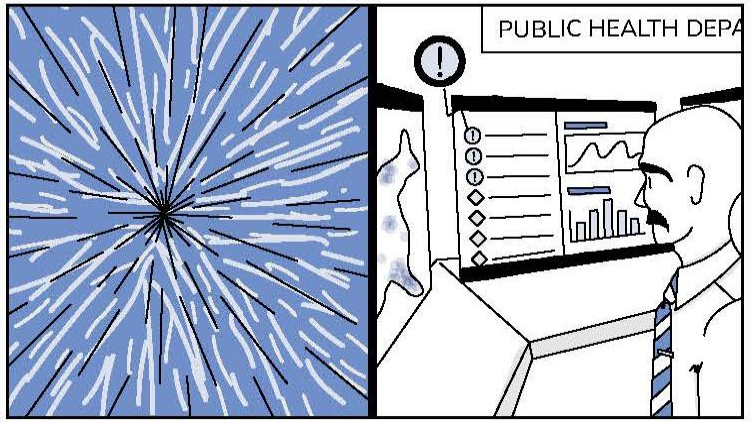
MOMENT 1A

Healthcare* is aware of and follows correct protocol as advised by public health



MOMENT 1B

Healthcare reports to public health with the date public health needs



MOMENT 1C

Public health receives timely*, usable* data to initiate case investigation

FUTURE STATE STORY

Future moments that matter with case data exchange

1. DETECTION

2. INVESTIGATION

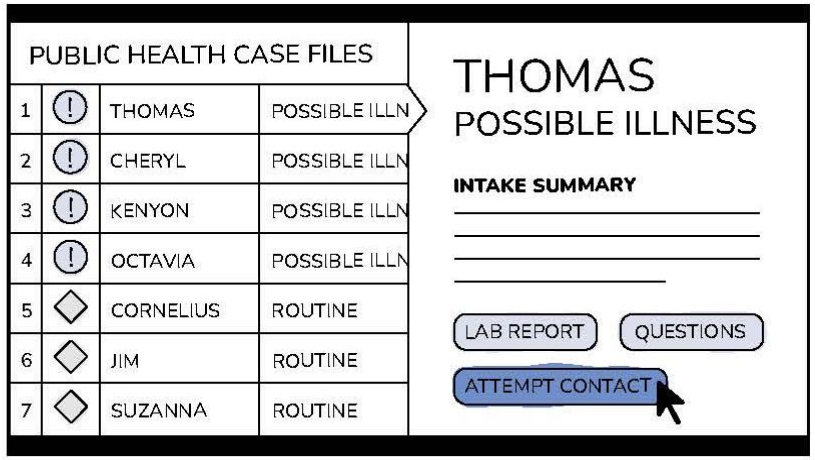
A case is confirmed, and the case investigator works to identify the source and stop the spread; case investigation occurs in both routine and emergent scenarios

3. OUTBREAK DETECTION

4. OUTBREAK INVESTIGATION

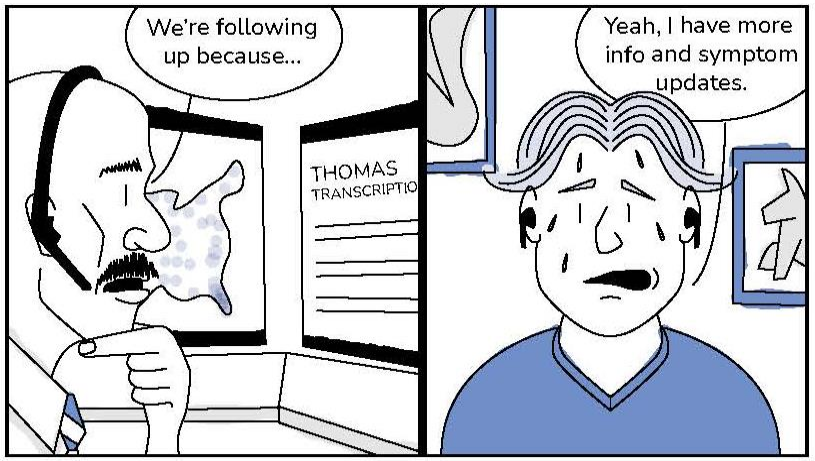
5. OUTBREAK INTERVENTION

6. DATA SHARING, ANALYSIS AND DISSEMINATION



MOMENT 2A

Investigator receives information to initiate the investigation



MOMENT 2B

As needed, investigator reviews information and contacts the person

FUTURE STATE STORY

Future moments that matter with case data exchange

1. DETECTION

2. INVESTIGATION

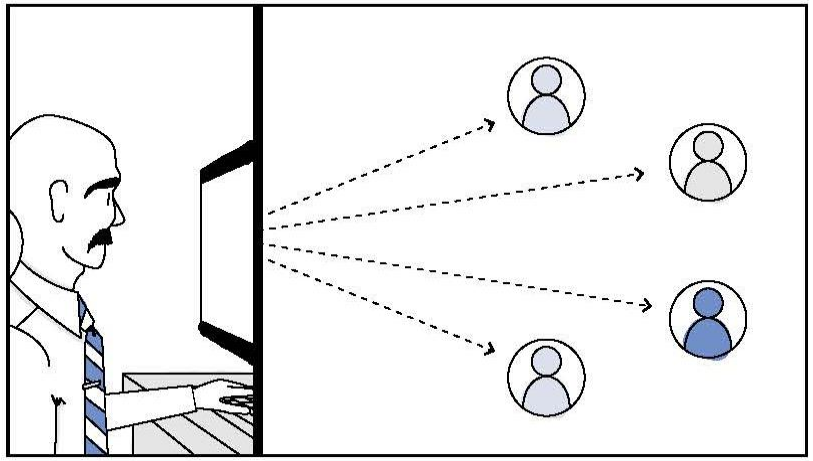
A case is confirmed, and the case investigator works to identify the source and stop the spread; case investigation occurs in both routine and emergent scenarios

3. OUTBREAK DETECTION

4. OUTBREAK INVESTIGATION

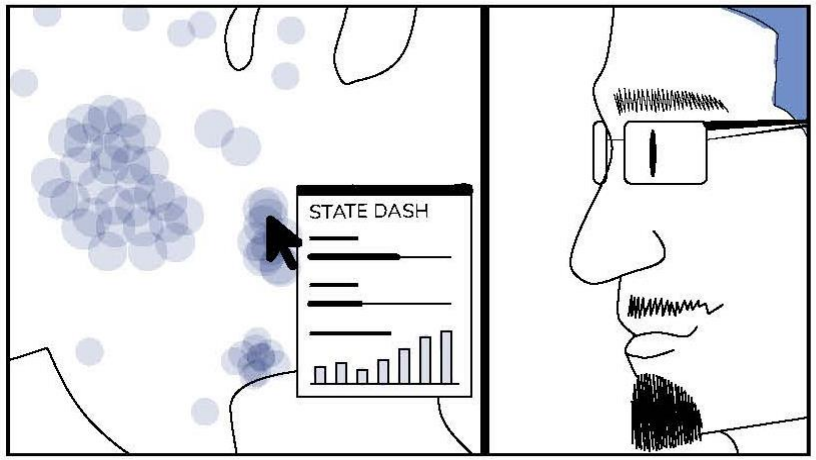
5. OUTBREAK INTERVENTION

6. DATA SHARING, ANALYSIS AND DISSEMINATION



MOMENT 2C

Investigator updates surveillance system, making data available to others



MOMENT 2D

CDC receives notification with needed anonymized data in near-real time upon jurisdiction entry

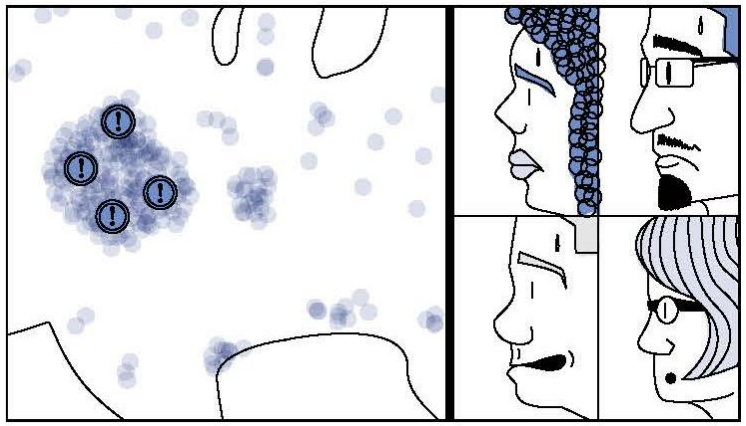
FUTURE STATE STORY

Future moments that matter with case data exchange

1. DETECTION
2. INVESTIGATION
3. OUTBREAK DETECTION

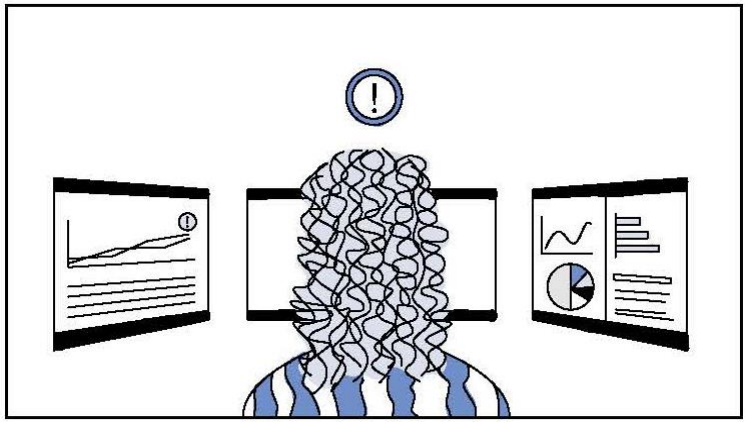
Cases above expected number and unusual patterns are identified

4. OUTBREAK INVESTIGATION
5. OUTBREAK INTERVENTION
6. DATA SHARING, ANALYSIS AND DISSEMINATION



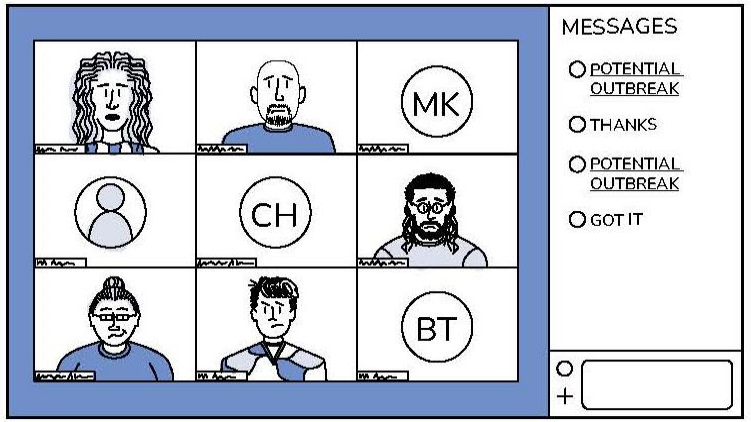
MOMENT 3A

Public health is alerted to potential outbreak



MOMENT 3B

Alerts from complementary data sources drive action



MOMENT 3C

Public health prepares for investigation and response

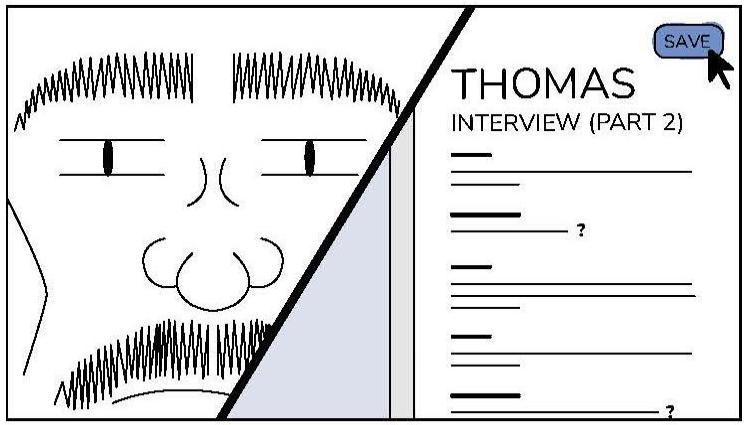
FUTURE STATE STORY

Future moments that matter with case data exchange

1. DETECTION
2. INVESTIGATION
3. OUTBREAK DETECTION
4. OUTBREAK INVESTIGATION

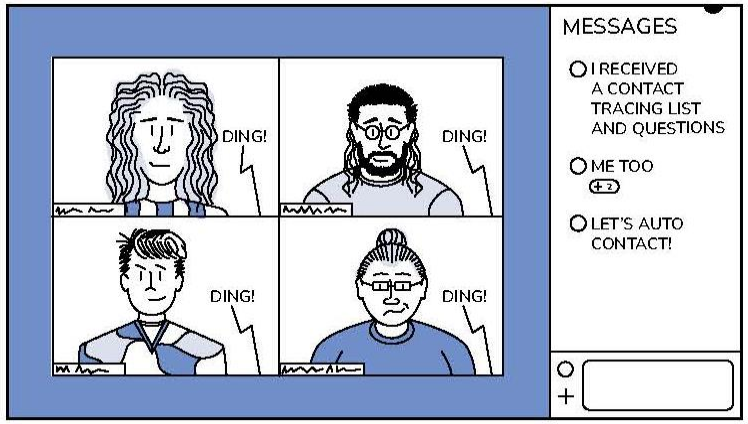
Multiple cases are identified and additional investigation begins to identify common exposure; sometimes there are multiple exposure sources and sometimes it is a single source.

5. OUTBREAK INTERVENTION
6. DATA SHARING, ANALYSIS AND DISSEMINATION



MOMENT 4A

Investigator collects and shares data



MOMENT 4B

Contact and exposure lists are easily disseminated

MOMENT 4C

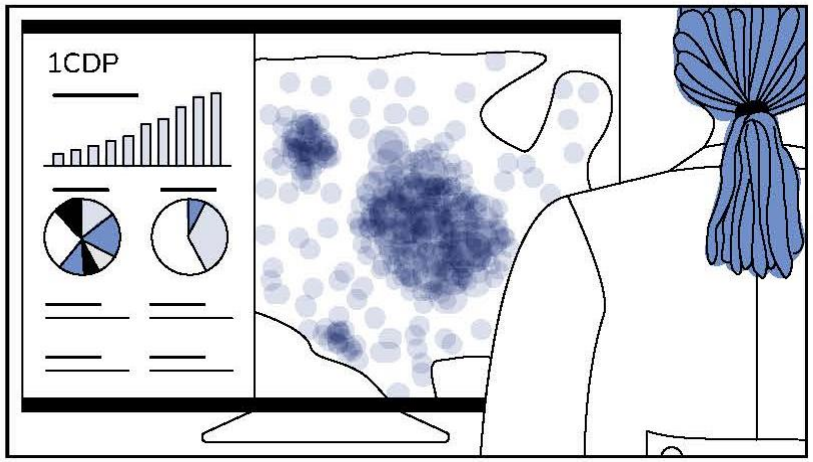
New questions are disseminated and quickly incorporated

FUTURE STATE STORY

Future moments that matter with case data exchange

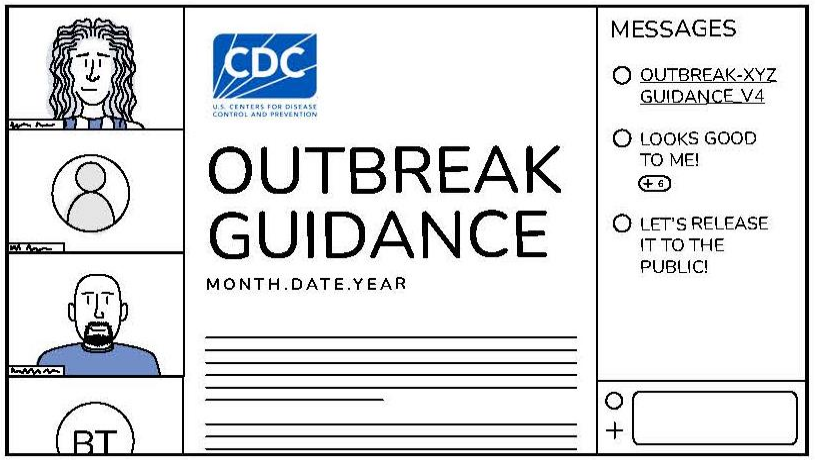
1. DETECTION
2. INVESTIGATION
3. OUTBREAK DETECTION
4. OUTBREAK INVESTIGATION
5. OUTBREAK INTERVENTION

   Public health mobilizes to stop the spread.
6. DATA SHARING, ANALYSIS AND DISSEMINATION



MOMENT 5A

As they are collected, data are available for analysis to guide public health action



MOMENT 5B

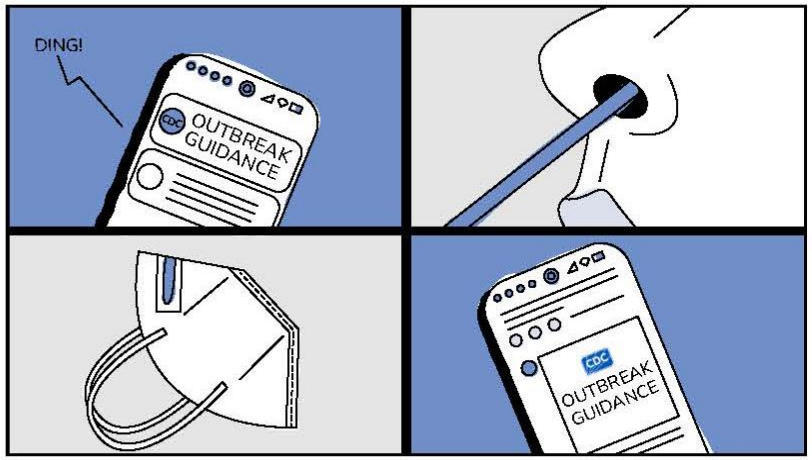
CDC uses data to deliver national guidance

FUTURE STATE STORY

Future moments that matter with case data exchange

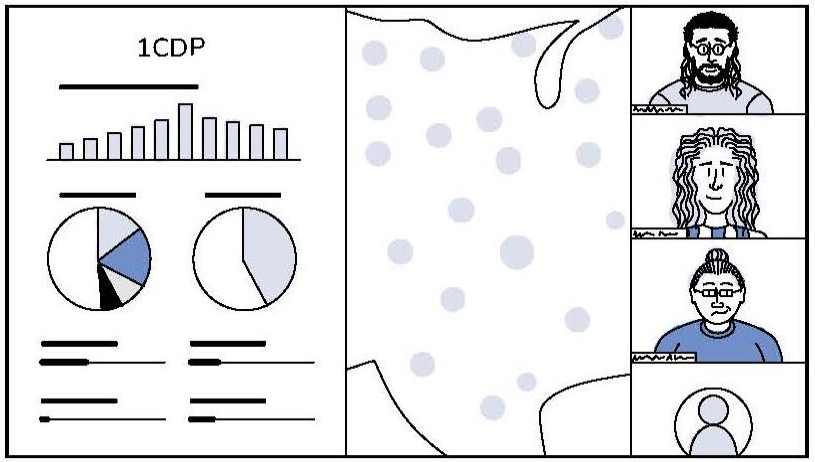
1. DETECTION
2. INVESTIGATION
3. OUTBREAK DETECTION
4. OUTBREAK INVESTIGATION
5. OUTBREAK INTERVENTION

   Public health mobilizes to stop the spread.
6. DATA SHARING, ANALYSIS AND DISSEMINATION



MOMENT 5C

Health departments use data for targeted intervention



MOMENT 5D

All levels of public health continue to collaborate until the outbreak is over

FUTURE STATE STORY

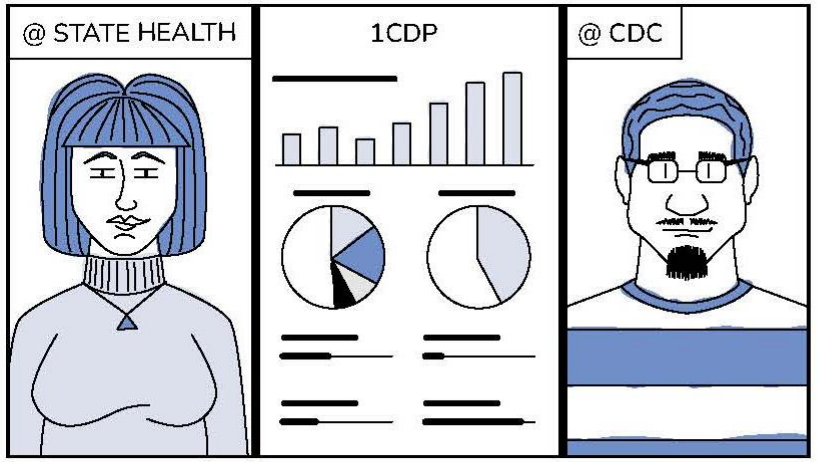
Future moments that matter with case data exchange

1. DETECTION
2. INVESTIGATION
3. OUTBREAK DETECTION
4. OUTBREAK INVESTIGATION
5. OUTBREAK INTERVENTION
6. DATA SHARING, ANALYSIS AND DISSEMINATION

Data are continuously shared across all levels of public health and with health care. They are analyzed and visualized to inform decision-making and inform the public.

MOMENT 6A

Ready-to-use data* are available at the right time to all parties*



MOMENT 6B

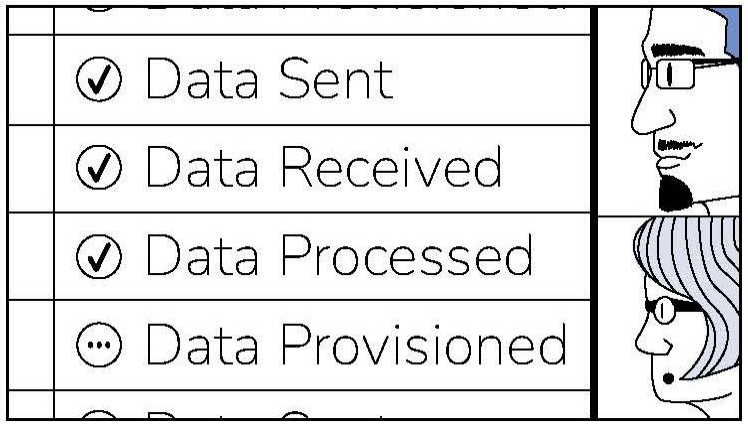
States share data with CDC in accordance with the Core DUA*

FUTURE STATE STORY

Future moments that matter with case data exchange

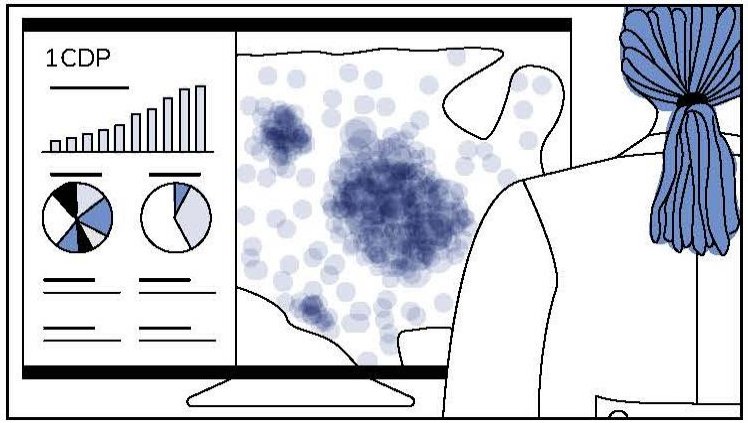
1. DETECTION
2. INVESTIGATION
3. OUTBREAK DETECTION
4. OUTBREAK INVESTIGATION
5. OUTBREAK INTERVENTION
6. DATA SHARING, ANALYSIS AND DISSEMINATION

Data are continuously shared across all levels of public health and with health care. They are analyzed and visualized to inform decision-making and inform the public.



MOMENT 6C

At all times, STLTs and programs can see the status of the data they have sent to CDC



MOMENT 6D

CDC and STLT programs analyze and disseminate data that are synced with each other

FUTURE STATE STORY

Future moments that matter with case data exchange

1. DETECTION

2. INVESTIGATION

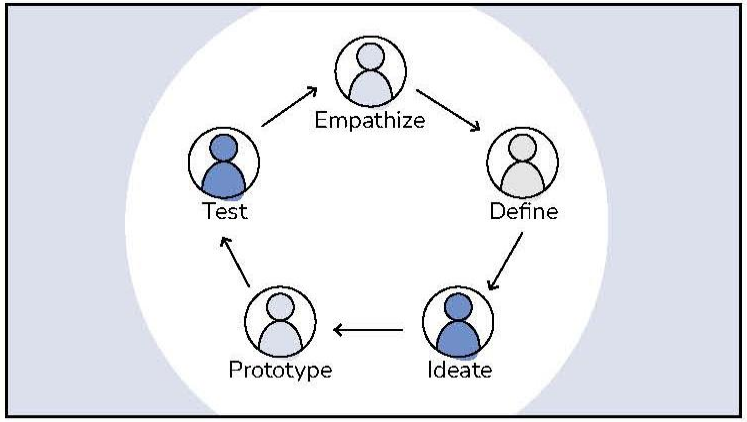
3. OUTBREAK DETECTION

4. OUTBREAK INVESTIGATION

5. OUTBREAK INTERVENTION

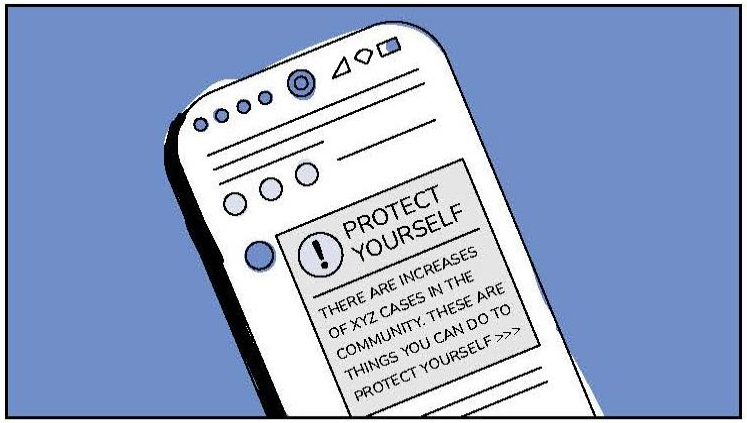
6. DATA SHARING, ANALYSIS AND DISSEMINATION

Data are continuously shared across all levels of public health and with health care. They are analyzed and visualized to inform decision-making and inform the public.



MOMENT 6E

Public health maintains and continuously improves technology and processes.



MOMENT 6F

Timely, ongoing guidance delivered by public health and healthcare help the public stay informed and take appropriate action.

What must be true?

Our future story depends on many ideas and changes becoming a reality

The arc of completing these dependencies is long, but there are tractable, near-term ones that public health can prioritize. We choose where to begin amongst our aspirations.

Healthcare shares the data public health needs, and data are readily utilized by all levels of public health.	Public health data systems are interoperable, information is easily shared, and relevant information is readily available.	1CDP, the enterprise data platform at CDC, is a capable and adaptive solution to centralize, ingest, and serve public health information.	Public health has revolutionized its demands and processes for data to inform the right, timely action.	Artificial Intelligence and automation reduce the manual burden and speed up time to action.
Goals 1 + 2	**Goals 1–4**	**Goals 1–4**	**Goal 1**	**Goal 2**

Public Health Data Strategy Goals

Manual processes: What must be true overview

What we heard from you!

There are **too many inefficient, manual processes in the exchange of public health data** that delay action, introduce errors, and create painful experiences for public health and healthcare workforce.

- **AI systems must be able to reliably extract, ingest, and validate case data** from diverse sources (e.g., EHRs, lab systems, surveillance systems) with minimal manual intervention.
- **AI algorithms must be able to analyze incoming data in near real time, detect trends or anomalies** (such as emerging outbreaks), and provide actionable alerts to public health professionals.
- **Geocoding and automation support case routing** to the appropriate jurisdictions.
- **Automation supports data visualization and communications.**

Examples of what CDC is doing today…

AI + 1CDP | DIBBS | eCR Optimization

Generative AI guidance

Integrated systems + processes: What must be true overview

What we heard from you!

Siloed systems block access to data, force redundant work, and strain the workforce, putting accurate and timely public health action and community trust at risk.

- ☑ Public health **data systems are interoperable;** information is easily **shared, and relevant information is readily available.**
- ☑ **Data are integrated, well synchronized, and shared with appropriate protections and security, providing a single source of truth.**
- ☑ **Systems are modern and maintained to leverage the latest innovations.**

Examples of what CDC is doing today…

1CDP	NBS Modernization	MDN
Intermediary Framework	APHL & CSTE eCR work	Core DUAs

Access to data: What must be true overview

What we heard from you!

Public health **workers lack efficient or consistent access to critical data,** creating additional manual work, gaps in actionable knowledge, and less effective and delayed public health action.

- Systems offer **secure patient data capture** and exchange and alternate ways to contact and interview patients.
- **DUAs are in place** and can be easily amended as public health data needs change.
- **Healthcare is able and willing to share** quality data with public health.
- There is access to new and alternative sources of data; **data are high quality and reliable.**
- **Infrastructure is integrated and interoperable**.

Examples of what CDC is doing today…

Intermediary Framework	Core DUA	1CDP
eCR	NBS Modernization	DataHub

Sustainable workforce: What must be true overview

What we heard from you!

The **lack of defined staff skills, boom and bust categorical funding, and poorly defined roles** that don't match people's actual tasks impede the ability of public health agencies to hire, retain, and train adequate and effective staffing.

- **Appropriate funding and staff** ensures workforce and infrastructure stability in jurisdictions.
- **Health departments collaborate to provide technical assistance** or expanded capacity to respond to public health needs.
- The public health workforce keeps pace with modernization efforts through **accessible training and education.**
- **Sharing technical support** and subject matter expertise bridges capacity gaps.

Examples of what CDC is doing today…

- Implementation Centers
- Workforce Acceleration Initiative (WAI) Support
- ELC / PHIG Technical Assistance
- COP engagements

Collaboration + orchestration: What must be true overview

What we heard from you!

Lack of strategic planning, timeliness and transparency in decision making, and changing priorities have resulted in suboptimal data modernization efforts that have further eroded efficacy across an already strained PH ecosystem.

- ☑ Collaboration between state, tribal, local, territorial health departments and CDC drives **data standardization, interoperability, and shared IT support.**
- ☑ The **workforce is proficient with current tools** and ready to adopt innovation.
- ☑ **Strong relationships—within public health and with healthcare**—bust siloes, share knowledge, and drive alignment.
- ☑ CDC, jurisdictions, tribes, partners, health care, and the public **share trust and respect.**
- ☑ **Open and clear feedback loops** inform continuous improvement across the ecosystem.

Examples of what CDC is doing today…

- Public Health Data Strategy
- Case Service Design
- Implementation Centers
- Workforce Acceleration Initiative (WAI)
- ELC / PHIG Technical Assistance

Standardization: What must be true overview

It is challenging to promote the development, adoption, **and implementation of interoperability standards** across the public health and healthcare ecosystem.

What we heard from you!

- **Clear data standards are adopted** across public health.
- **Participating in health information exchanges** is easy with clear roles, responsibilities, DUAs, and policies.
- **Well-defined technical standards and capabilities** facilitate the building and testing of surveillance systems.
- **Staff are trained and knowledgeable on standards** used in public health systems.

Examples of what CDC is doing today…

- Intermediary Framework
- NBS Modernization
- Core DUA
- CDC Data Sharing Guidance
- National Biosurveillance Work

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.