



Issue Brief: Health IT for Public Health Reporting and Information Systems

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What's the Issue?

Public health agencies collect health information to prevent and contain outbreaks, analyze population health trends, and educate and promote healthy choices for populations. For example, public health agencies track immunizations and cases of infectious diseases. With an aging population and increase in noninfectious diseases, public health agencies have also started collecting information on cancers and other chronic diseases. Traditionally, health care providers report to public health agencies periodically using paper or through electronic means to specialty registries or systems. Health care providers are also typically required by local, state, or federal law to report certain public health data and conditions.

Public health reporting incentives in the Medicare and Medicaid EHR Incentive Programs (“meaningful use”) are spurring development of public health infrastructure and its use of health information technology (health IT). This development enables the public health infrastructure to receive data from electronic health records (EHRs), is increasing partnerships between health information exchanges (HIEs) and public health, and is fostering development of standards for public health reporting.

With the increased EHR adoption, public health data can now be more rapidly reported to public health agencies. This public health data can also be formatted in standardized ways and sent using commonly accepted content standards, reducing the amount of translation and need for system updates in order to accept the information.

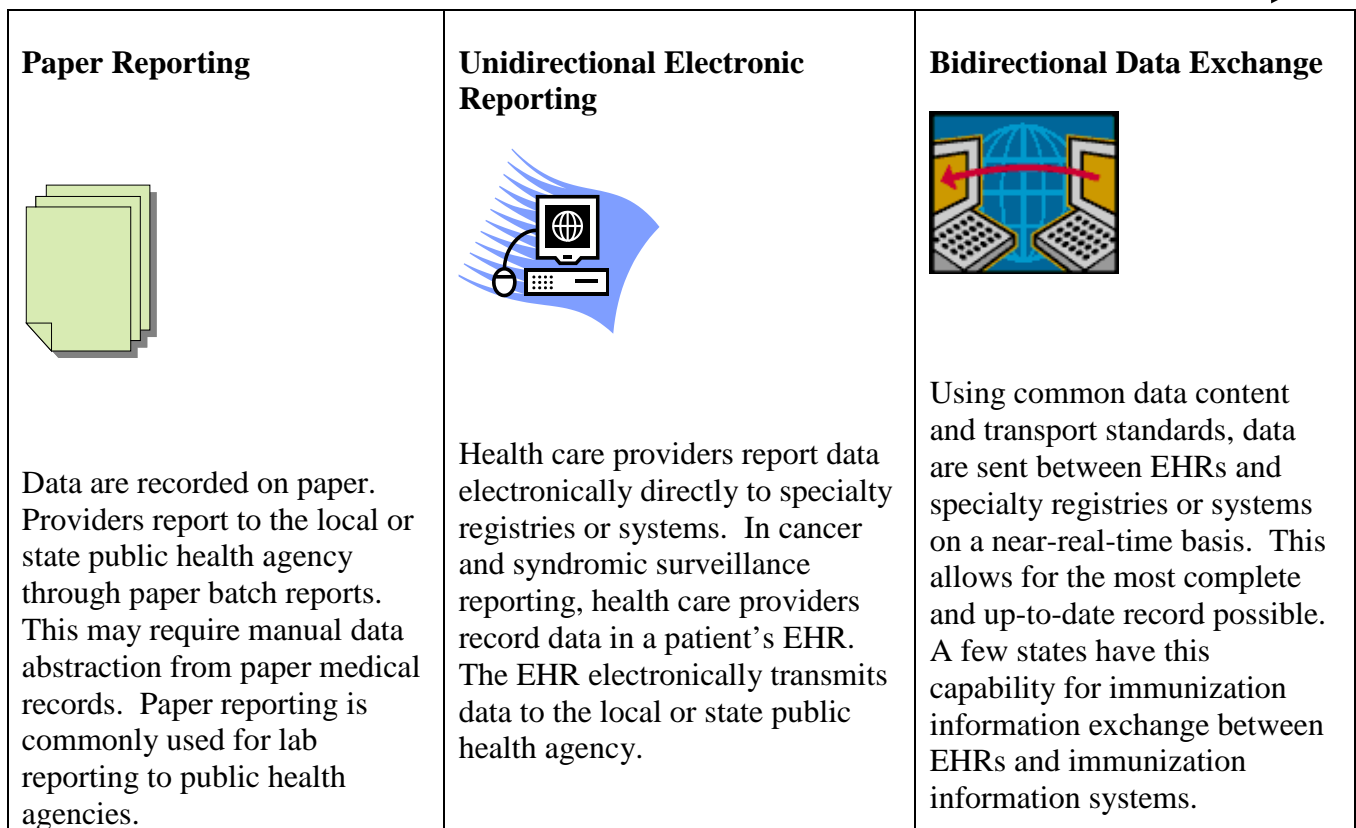
This issue brief describes electronic public health reporting progress and discusses opportunities to further improve public health reporting and information systems.

What Has Happened So Far?

Public Health Reporting

Figure 1 below demonstrates the stages of maturity in public health reporting. The goal is to move to seamless, real-time or near-real-time bidirectional exchange of data.

Figure 1: Public Health Reporting: From Paper Records to Bidirectional Data Exchange →



Medicare and Medicaid EHR Incentive Programs

As of data available through May 2013, over [half of eligible health providers and nearly 80% of hospitals are using EHRs](#) to improve health care in the U.S. These improvements were driven by the American Recovery and Reinvestment Act’s (ARRA) [Health Information Technology for Economic and Clinical Health \(HITECH\)](#) provisions, which authorized incentives for health care providers if they demonstrate “meaningful use” of certified EHR technology.

The Medicare and Medicaid EHR Incentive Programs are administered by the Centers for Medicare & Medicaid Services (CMS). CMS establishes the measures on which eligible providers and hospitals must report to demonstrate [meaningful use](#), and works with the [Office of the National Coordinator for Health Information Technology \(ONC\)](#) to establish the technical requirements for EHR technology.

Meaningful Use Public Health Measures

The goal of [Stage 1 of meaningful use of EHRs](#) is to capture and share data before moving on to advancing clinical processes and improving outcomes in later stages. Both eligible providers and eligible hospitals have the option to choose from a menu of objectives, including reporting immunization information and syndromic surveillance data to the appropriate public health agency; eligible hospitals also have the option to report electronic lab results.

Figure 2:
Meaningful Use Stages 1 and 2 Public Health Measures

	Stage 1		Stage 2	
	Core	Menu	Core	Menu
Immunization information		EP, EH/CAH	EP, EH/CAH	
Electronic laboratory results		EH/CAH	EH/CAH	
Syndromic surveillance		EP, EH/CAH	EH/CAH	EP
Cancer registries				EP
Specialized registries				EP

EP = eligible provider, EH = eligible hospital, CAH = critical access hospital

Notes: Core = required; Menu = optional

Some of the earliest participants in the Stage 1 program advanced to [Stage 2](#) in 2014. As shown in Figure 2, eligible hospitals are required to submit syndromic surveillance, electronic lab results, and immunization data to public health agencies in Stage 2. Eligible providers are required to report immunization data. Eligible providers also have the option to choose from a menu of additional objectives including reporting to cancer registries, specialized registries (e.g., birth defects registries, chronic disease registries, traumatic injury registries), and syndromic surveillance. Many of the public health measures become core (required) in Stage 2, which will lead to more providers and hospitals submitting data to public health agencies.

The meaningful use programs require the use of “Certified EHR Technology” as defined by the ONC through its [standards and certification criteria](#). EHR technology certified to perform public health reporting functions require adherence and testing to nationally recognized standards and associated implementation guides. Toward that end, the public health community has made significant progress toward systems that reduce variability and improve the quality of the data collected.

Meaningful Use for Public Health Data Collection

As described in the following examples, meaningful use is increasing the volume of electronic public health reporting.

Eligible providers and hospitals [attest](#) to meeting meaningful use objectives to CMS. Since the beginning of the meaningful use program in 2011 through data available for February 2014, 40% of eligible providers have chosen to submit immunization data to registries. Six percent of eligible providers have chosen to submit syndromic surveillance data to public health agencies. Based on data available through November 2013 for eligible hospitals, 54% have submitted data

- Thirteen states and one city were sending over 75% of their total volume of lab reports electronically, and 17 states and one city were sending 50-75% of their total volume of lab reports electronically.
- HIV, lead/toxic, and STD electronic lab reports were the disease categories with the greatest number of lab reports, each area with over 2.5 million reports sent electronically in a 12-month period.³

The last six months of 2012 saw a 68% increase in the number of hospital labs meaningfully using electronic lab reporting.

Twenty Centers for Disease Control and Prevention (CDC) [grantees](#) have been awarded ARRA funds to support enhanced interoperability of EHRs with immunization information systems (IIS). Due to this funding, a number of grantees have increased their support for standardized transmissions. For example, there has been an increase in the number of grantees able to support the [HL7 messaging format](#) required to achieve meaningful use. Over 380 grantee sites, including over 1,800 providers, have enhanced their systems to IIS-EHR bidirectional data exchange.⁴ Through these and other related efforts related to meaningful use, 46 public health jurisdictions are capable of receiving immunization data.⁵

The [BioSense 2.0](#) program pulls together information on emergency department visits and hospitalizations from multiple sources, including the Department of Veterans Affairs, the Department of Defense, and civilian hospitals from around the country. The BioSense program works with state or local health departments that have agreed to share data from their own emergency department monitoring systems to collect data from civilian hospitals. Analysis of these data provides insight into the health of communities and the country. Such data are vital to guide decision making and actions by public health agencies at local, regional, and national levels. Today, 47 public health jurisdictions are capable of receiving syndromic surveillance data.⁶

A [public tool](#) developed by the American Public Health Laboratories lists the public health readiness of health departments across the country for receiving immunization, syndromic surveillance, reportable lab results, cancer registry, and specialized registry data.

³ Electronic Laboratory Reporting Updates and Strategic Discussion ONC-CDC. CDC presentation at ONC Annual Meeting on January 25, 2014.

⁴ EHR-IIS Interoperability: Progress to Date and Preliminary Outcomes. CDC presentation to ONC on September 20, 2012.

⁵ <http://www.aphl.org/aphlprograms/informatics/Pages/MU2PHAReadiness.aspx>

⁶ <http://www.aphl.org/aphlprograms/informatics/Pages/MU2PHAReadiness.aspx>

Standardization of Public Health Reporting

Increased health information technology adoption has also led to a number of initiatives focused on standards for public health reporting that have the potential to increase real-time bidirectional data exchange.

[Health Information Exchanges \(HIEs\)](#) are helping connect public health agencies with health care providers, providing certified systems to meet meaningful use measures. HIE involves the electronic sharing of health-related information among organizations and includes an organization to provide services to enable the electronic sharing of health-related information. HIEs are also developing abilities for near real-time public health surveillance, such as for syndromic surveillance and real-time tracking of patients' physical location during emergencies and disasters.

As more patients have access to their health data, more will become empowered to make informed health care decisions. For example, consumer access to immunization information offers a number of benefits. It reduces the need to visit the health care provider to access immunization records during peak times of the year, such as for back-to-school, child daycare, and summer camp. Consumer access also empowers consumers and caregivers with more information about their immunization history records in making decisions about what vaccines may be needed in the future. However, traditional IIS are developed and administered by public health agencies, and only authorized health care providers have access to the data. HHS is working with states to provide consumers access to their own immunization history information from IIS using secure, easy-to-use online portals. Consumer access to immunization records is already being provided in [San Diego](#), [Indiana](#), and through services offered by health information technology developers.

What Are the Opportunities?

Implementation of Standards for Public Health Reporting

The ONC works with public health agencies, CDC, EHR vendors, and other stakeholders to develop [consensus-based implementation guides \(IGs\)](#) for electronic transmission of immunization, syndromic surveillance, lab reports, and cancer registry data. The IGs promote guidance for designing and implementing systems that are interoperable. Although the IGs allow for a certain amount of local variability, too much variability can limit interoperability⁷ between systems.

The ONC continues to work in two areas: 1) providing technical assistance to certain stakeholders (e.g., Regional Extension Centers, HIEs, and EHR technology developers) in the implementation of the IGs to reduce local variability that inhibits interoperability, and 2) contributing to the development of updated IGs to fix known issues and limit variability to

⁷ ONC uses the definition of interoperability from the Institute for Electrical and Electronics Engineering as “the ability of two or more systems or components to exchange information and to use the information that has been exchanged.”

promote interoperability. The ONC has adopted these IGs in its [standards and certification criteria for EHR technology rules](#). Eligible Providers (EPs), Eligible Hospitals (EHs), and Critical Access Hospitals (CAHs) must use EHR technology certified to the standards the ONC has adopted in order to qualify for the Medicare and Medicaid EHR Incentive Programs.

Collaboration Between Public Health and Health Information Exchanges

As previously discussed, HIEs can provide valuable data exchange and infrastructure supports to public health agencies to promote more seamless information exchange. HIEs can also pool together data from many sources, including but not limited to hospitals, providers, laboratories, and pharmacies, which contribute to public health data collection. The ONC serves as key convener bringing together public health agencies with HIE entities, and providing guidance on public health reporting with a focus on streamlining IT systems and preventing duplication.

A few state health departments are requiring providers submit public health data through the state HIE, thereby streamlining the system. For example, starting in 2014, the Virginia Department of Health is requiring that immunization, syndromic surveillance, cancer, and reportable lab data are sent through the state HIE, [ConnectVirginia](#). This will facilitate access to and retrieval of clinical and public health data. The Mississippi Department of Health has also [recently mandated](#) that reportable public health data are sent through the Mississippi Health Information Network (MS-HIN). The Mississippi Department of Health features a checklist on their website that demonstrates how to submit meaningful use public health reports via MS-HIN and to qualify for meaningful use for those objectives.

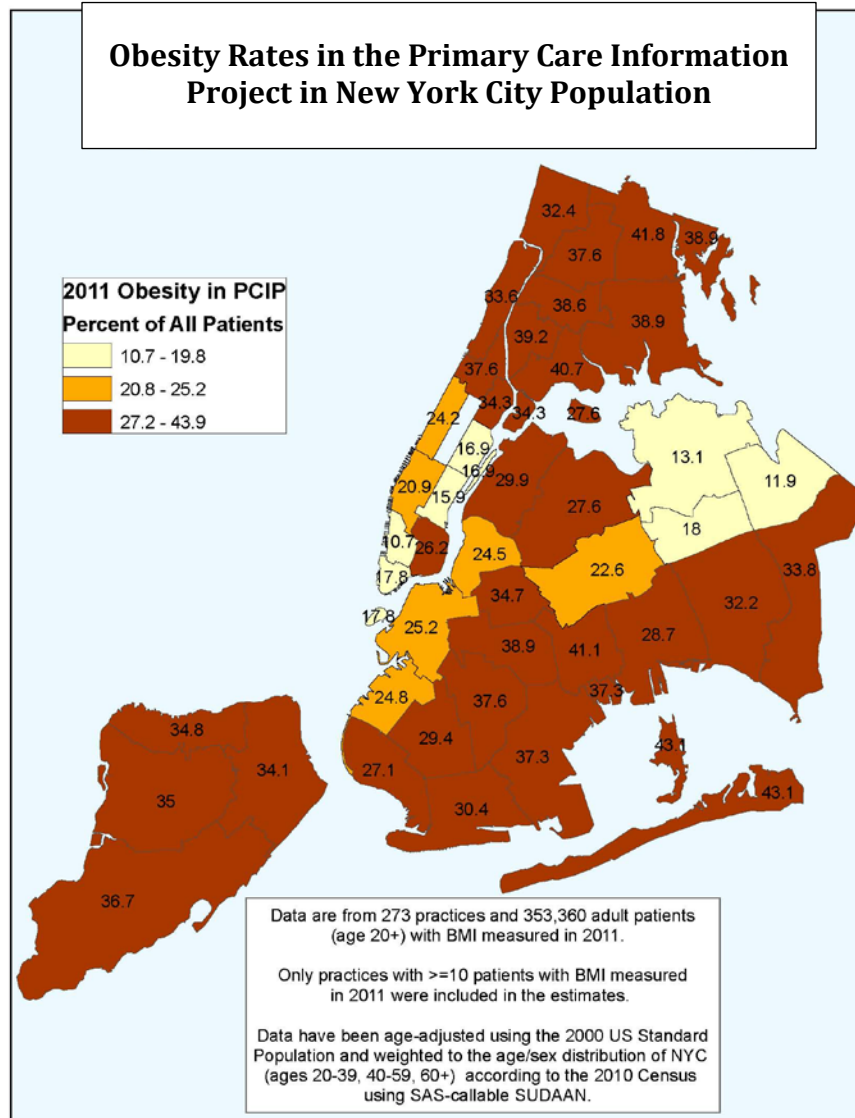
Emerging Standards Can be Leveraged for Population Health and to Address Disparities

Data Access Framework (also known as [QueryHealth](#)) is an ONC-led initiative focused on using distributed networks to analyze data from multiple organizations in aggregate form for secondary uses such as disease surveillance, comparative effectiveness, and medical product safety. The Data Access Framework model takes individual level data, de-identifies the information in compliance with HIPAA, and aggregates information for population health use. Models such as Massachusetts' [PopMedNet](#) allow each network to create, administer, and govern their networks. Pilots include the New York State Department of Public Health's focus on hypertension, CDC's focus on disease syndromes and situation awareness, the Massachusetts Department of Public Health focus on diabetes, and the Food and Drug Administration's (FDA) use to monitor the cardiac outcomes of particular drugs.

The Data Access Framework initiative allows public health agencies to query across populations in their community to identify characteristics of the target population. This feature can be used to look at health disparities within a community. For example, New York City was able to estimate the prevalence of obesity in neighborhoods across Manhattan and surrounding

Boroughs.⁸ As shown in Figure 4 below, looking at this data geographically allows for targeted interventions for the populations at highest risk.

Figure 4:



The utility of EHR data for supplemental purposes such as public health reporting, research, patient-safety event reporting, and coverage determination has been limited due to lack of

⁸ <http://www.iom.edu/~media/Files/Activity%20Files/PublicHealth/SocialDeterminants-EHR/BuckMichaelIOM2014Ver2.pptx>

uniformity in the terminology and definitions of data elements across EHRs. In addition, clinicians often report information in unstructured free text. Linking EHR data with other data in a uniform and structured way could accelerate population health, safety and quality improvement, and research. Toward this end, the [Structured Data Capture \(SDC\) Public Health Tiger Team](#) has begun to identify public health use cases, develop and consolidate common data elements, and build metadata that can be used to pre-populate forms in EHRs.

An ONC initiative known as [Health eDecisions \(HeD\)](#) focuses on defining and harmonizing standards that could facilitate the emergence of systems and services for shareable clinical decision support. These standards support event condition rules and requests for clinical guidance that could support EHR alerts. For public health, HeD has been pilot tested for alerts to administer pertussis vaccinations. HeD can be expanded to support electronic public health reporting from health care providers and laboratories to public health agencies.

Medicaid 90/10 Funding Opportunities for Public Health Infrastructure

As the volume of data coming in to public health agencies continues to increase, public health agencies need to build the technical and administrative infrastructure to receive the data. Public health agencies traditionally received reporting data through paper reporting, batch electronic files, and/or through specialty registries. The increasing use of EHRs to collect data is spurring more real-time data collection, and public health agencies are working to build the infrastructure to support more frequent data feeds. The Medicaid Electronic Health Record Incentive Program offers public health agencies an opportunity to apply for up to [90 percent federal matching funds \(90/10\)](#) through HITECH administrative funding. State public health agencies have worked with their Medicaid programs to take advantage of this opportunity to support activities related to onboarding and the design, development, and implementation of infrastructure, including HIE activities. The ONC assists state and local public health through the application process (Medicaid Implementation Advance Planning Document (IAPD)) by providing guidance on the development of technical infrastructure and linking public health agencies with appropriate federal partners such as CDC and CMS. See feature box for specific state examples of applications for IAPD funding.

Washington IAPD to Support Public Health Onboarding

The State of Washington Department of Health submitted an IAPD funding request to support public health activities, including onboarding staff to process registrations to receive public health data from EPs and EH/CAHs. Washington's model uses the statewide HIE to receive all public health data. The funding scope of work includes planned enhancements to upgrade the state's syndromic surveillance system, upscale the Enterprise Integration Engine and connect it to the HIE, and acknowledge ongoing production of public health data submission. Washington Department of Health received an estimated \$1.4 million for FY14 to support these upgrades.

CRISP and Maryland IAPD Funding for Public Health Connectivity Efforts

The Maryland Department of Health and Mental Hygiene (DHMH) submitted an HIE funding request through a CMS IAPD for funding for HIE development and deployment activities. The Maryland Health Care Commission has designated the [Chesapeake Regional Information System for our Patients](#) (CRISP) as the State Entity for HIE. The funding request scope of work focused on design, development, and implementation activities of hospital public health reporting through CRISP, including electronic lab reporting, immunization reporting, and syndromic surveillance reporting. DHMH encourages all hospitals to submit syndromic surveillance data, immunizations and reportable lab results to DHMH through CRISP. To prioritize and expedite the work efforts associated with public health connectivity, DHMH requested and received an estimated \$1.7 million for FY14 IAPD funds to support internal development and quality assurance resources and CRISP's hospital interface development and testing efforts to ensure the interfaces are functioning properly.

Health Information Technology for Public Health Preparedness and Situational Awareness

Health IT developments, including HIEs as previously discussed, are also being leveraged to build capacity for public health preparedness and situational awareness.

Consumer-held electronic health information can be used during emergency situations where paper medical records may be lost, EHR systems are inaccessible, and/or patients are displaced. [Blue Button](#), initially developed by the Veterans Health Administration, is an ONC-led initiative that allows consumers/patients to securely download and access their health records electronically. This information can be carried on a mobile or other electronic device. HHS is exploring the widespread use of Blue Button during emergencies to allow consumers to give

access to their health data to other entities (e.g., first responders, health care providers). This model's success has already been demonstrated during Hurricane Sandy in 2012. During the catastrophe, the New York state HIE (SHIN-NY) provided Blue Button access to HIE data. Patients could use their mobile or other electronic device to consent to make their health information available to health care providers. As of July 2013, over 88 million individuals had access to some of their clinical data or claims through Blue Button.⁹ The ONC has developed technical standards for Blue Button through a [Blue Button Plus Implementation Guide](#). This guide suggests transport mechanisms and common data elements for the Blue Button model.

As previously discussed, the Data Access Framework initiative allows public health agencies to query across populations in their community to identify characteristics of the target population. Data Access Framework can also be used to identify vulnerable populations during emergencies, such as those that are insulin-dependent or have medical devices that require backup power during disasters.

Eligible hospitals and critical access hospitals must report on a number of [clinical quality measures \(CQMs\)](#) to meet the requirements of meaningful use. These CQMs may help determine hospital surge capacity and allocation of resources and staffing during a large scale emergency event. For eligible hospitals and critical access hospitals, these CQMs include three measures¹⁰ of emergency department capacity:

- Emergency Department Throughput – Median time from ED arrival to ED departure for admitted ED patients (Measure ED-1);
- Emergency Department Throughput – admitted patients – Admission decision time to ED departure time for admitted patients (Measure ED-2); and
- Median time from ED arrival to ED departure for discharged ED patients (Measure ED-3).

These CQMs can be useful for resource planning and operations during emergencies. There currently are no CQMs for the intensive care unit setting, and it may be valuable to develop and use these for resource management. At this time, measures for eligible providers are not designed in a way that would support resource management at the provider level.

Some states have the ability through hospital and emergency department admissions to track patients in real-time through admissions, discharges, and transfers (ADT) feeds through the HIE. ADT is a common type of HL7¹¹ message that includes patient demographic information. Commonly used ADT messages include patient admit, patient transfer, patient discharge, patient registration, patient pre-admission, patient information update, cancel patient admit, cancel patient transfer, and cancel patient discharge.

⁹ www.healthit.gov/policy-researchers-implementers/strategic-plan-progress-report/consumer-ehealth

¹⁰ http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Downloads/2014_CQM_EH_FinalRule.pdf

¹¹ HL7 is a consensus-based health standards development organization

ADT feeds have the potential for tracking patients during emergencies and can assist with family reunification. For example, the District of Columbia (DC) Emergency Healthcare Coalition and CRISP¹² are collaborating to provide an innovative tool for family reunification in the event of large-scale emergencies in the region. CRISP receives real-time patient encounter data from hospitals in Maryland and DC. CRISP is developing a custom portal to provide emergency responders and hospital personnel in DC with access to query this data in order to locate displaced DC residents who have been hospitalized and inform their family members of their whereabouts. This level of hospital connectivity, combined with a single access point for disparate emergency personnel, will give DC the ability to locate displaced family members with unprecedented speed and efficiency.

Planning for emergency events can also help ensure that patient health information is protected and that patient information can be accessed when the disaster is over. The ONC released [a Web-based security training module "Cyber Secure: Your Medical Practice"](#) for health care providers and staff. This game focuses on disaster planning, data backup and recovery and other elements of contingency planning. In addition, the ONC released two [educational videos](#) designed for providers and their staff. One video describes contingency planning. The other video focuses on the security risk assessments (which include contingency planning) and is designed to raise awareness among providers and their staff.

What Are the Concerns?

Resources for Public Health Reporting Infrastructure

As discussed in the Opportunities section, the volume of data coming in to public health agencies continues to increase, and public health agencies need to build the technical and administrative infrastructure to receive the data. Additionally for meaningful use Stage 2, public health agencies must develop an on-boarding process to 1) receive and process registrations of intent from providers (EPs, EAs, and CAHs) to begin sending data to meet public health objectives, 2) prioritize providers, invite providers to begin testing and validation, engage in testing and validation, and 3) after successful testing and validation, receive ongoing transmission data from the provider. There is a need for more resources to support the on-boarding process.

With the development of infrastructure for public health reporting, state and local health departments also need to develop sustainability plans to address long-term investment capability. In order to sustain and continue building infrastructure to accommodate new standards and technology, plans should address vendor maintenance, licensing fees, technology updates, data storage, and skilled personnel.

What's Next?

The meaningful use programs have fostered a [community](#) of policy-makers, implementers, state and local public health, and other stakeholders who are working together to achieve meaningful

¹² Chesapeake Regional Information System for our Patients is Maryland's statewide Health Information Exchange

use Stage 1 and Stage 2 objectives for public health reporting, as well as moving toward bidirectional data exchange. Many emerging initiatives, such as consumer engagement, Data Access Framework, and structured data capture, hold potential for improving public health reporting and population health management through creation of standards. HHS promotes collaborations for building the infrastructure, implementing standards, and bringing together public health agencies and HIEs for improved public health reporting and information systems.

As meaningful use Stage 3 policy is developed, the Public Health Tiger Team of the S&I Framework will continue to work on public health use cases for existing standards including Data Access Framework, Structured Data Capture, and Health eDecisions as discussed in this brief. In order for these standards to be ready for Stage 3, the ONC will be working with stakeholders to complete end-to-end testing for comprehensive implementation guide development. Aligning the standards used for public health with other sectors in health care will also demonstrate public health's role in reducing health care costs, a key driver in health care reform efforts.

As the health care industry shifts toward value-based purchasing models, public health could continue to engage in discussions on transforming the delivery of care. Public health can play an important role in bridging different sectors of the health care system toward a more integrated approach. There is movement toward a consumer-centric view of care in which data follows the patient rather than being siloed. The public health infrastructure being built today can be leveraged with emerging models for secondary uses of data for population health management and research. A more robust data infrastructure also promotes resource management and planning for emergency preparedness.

The progress being made today sets a foundation for infrastructure and standards for better health outcomes and lower cost of care, not only for individuals, but also for public health.