

## Division of Informatics Solutions and Operations

*Providing Informatics and IT Solutions of Choice to Support Public Health*



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The Centers for Disease Control and Prevention (CDC)'s Division of Informatics Solutions and Operations (DISO) provides a portfolio of informatics and information technology (IT) solutions of choice that supports public health information exchange in the areas of surveillance, emergency preparedness, laboratory services, and other public health activities. DISO translates public health needs into information processes that are valued, cost effective, strategic, and congruent with the larger health IT world.

The division is responsible for managing shared services and applications to reduce the total cost of operation and improve return on investment at CDC and, as appropriate, other federal, state, territorial, and local public health agencies. DISO works to

- support notifiable and syndromic surveillance,
- support electronic laboratory reporting,
- support public health emergency preparedness,
- provide technical services to CDC programs and external partners, and
- help lead the effort to modernize the Public Health Information Network (PHIN) by developing innovative tools and publishing data standards and messaging guides.

DISO is in CDC's Public Health Surveillance and Informatics Program Office (proposed); Office of Surveillance, Epidemiology, and Laboratory Services.

### Key Programs and Projects

#### BioSense 2.0

DISO supports the redesigned BioSense program, or BioSense 2.0, which launched on November 15, 2011. BioSense 2.0's advantages include an environment that allows for sharing of data among jurisdictions, the development and support of shared analytical capabilities, shared governance of the program by key stakeholders, and the use of a cloud computing technology to revolutionize the way that public health surveillance is conducted. BioSense 2.0 is the first Department of Health and Human Services (HHS) system to completely move to the Internet cloud.

#### Data Interchange/Connectivity Services

Public health and clinical health organizations use the Internet to securely exchange sensitive data among various information systems. The PHIN Messaging System (MS) is a successful data exchange solution that hundreds of organizations have adopted. It is a secure public health data network with more than 700 connection points exchanging billions of messages per year. PHIN MS moves surveillance data, laboratory test results, immunization records, cancer registry entries, and healthcare quality data records reliably and securely by using industry-standard technologies. It uses a common approach to security, data encryption, and methods for dealing with various firewalls.

The national initiatives for clinical electronic health record (EHR) systems and meaningful use (MU) are profoundly affecting many aspects of public health, especially IT and

electronic data exchange. Because public health agencies must position themselves to electronically exchange data with clinical systems, they must use the same data communication protocols used in the clinical world. DISO works to support these protocols, with the full involvement of state and local agencies and several CDC programs.

In addition, DISO supports the CDC initiative to assess whether information collected routinely by health information exchanges (HIEs) can be used to evaluate the delivery of preventive care for cardiovascular disease and diabetes. HIEs collect and share electronic healthcare data among health professionals, clinics, laboratories, and other stakeholders within a region, community, or healthcare system.

HHS requirements for the meaningful use of health information technology, such as EHRs, include maintaining and reporting to the Centers for Medicare and Medicaid Services quality care measures, including delivery of clinical preventive services for conditions such as cardiovascular disease and diabetes. Potentially, HIEs could provide estimates on the delivery of those services to populations served by the healthcare organizations participating in the HIE.

Specifically, CDC is examining the ability of one or more HIEs to provide estimates on the delivery of aspirin therapy, blood pressure screening and control, cholesterol screening, and smoking cessation—also known as the ABCs—and glycemic control for diabetes to populations served by HIEs. Of the 44 Stage One Meaningful Use quality measures, 11 mapped directly to the cardiovascular and diabetes quality measures in this project. If information from HIEs can be used to monitor the delivery of these clinical preventive services, HIEs may offer timely, efficient, and low-cost monitoring of many services affected by implementation of the Affordable Care Act, the Health Information Technology for Economic and Clinical Health Act, and other recent efforts to improve quality of healthcare.

DISO has established connectivity between HealthInfoNet—an HIE in Maine—and the Maine Health Department by using Nationwide Health Information Network procedures. As of February 2012, a live data feed has been transmitted successfully from the HIE to the health department for National Quality Forum measures related to diabetes screening and control per the MU rule. On the basis of the Maine Health Department's priorities, DISO will develop procedures for transmitting additional ABCs- and diabetes-related measures.

#### **Messaging Support Services**

When public health and clinical health organizations exchange information over the Internet, they must agree not only on the transport protocols—how information moves from one location to another—but also on how the information is structured and encoded so that the various information systems can automatically process it. Negotiating and agreeing on messaging and vocabulary standards, and modifying information systems to use these standards, is a demanding and time-intensive process. DISO provides services that support CDC programs and external partners to accomplish this complex work.

The **PHIN Vocabulary Access and Distribution System** (VADS) is a Web-based, public health-wide system for creating, managing, publishing, accessing, and searching vocabularies (or code sets) used in electronically exchanging public health data. VADS is an online dictionary of vocabularies that serves as an authoritative reference for organizations that electronically send information to CDC or to health departments. Included in VADS is the Reportable Conditions Mapping Table (RCMT), which provides mappings between reportable conditions and their associated LOINC laboratory tests and SNOMED results. The RCMT uses standards suggested for the meaningful use measure of "reportable lab result reporting to public health."

The **PHIN Message Quality Framework** (MQF) is a testing tool that can assess whether messages follow the appropriate message and vocabulary standards. PHIN MQF validates the structure of the message, confirms that the message follows all business rules defined



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for it, and verifies that the vocabulary used in the message is correct. By using PHIN MQF, organizations can test whether their systems are producing correctly formatted messages that receivers will be able to unload and use. This self-testing capability drastically decreases both the cost and time associated with manually identifying and resolving complex message formatting issues that occur when connecting any two systems. Many senders and receivers of meaningful use messages are using this tool as part of the testing and on-boarding process prior to attestation. This tool is hosted at CDC and can be accessed at <https://phinmqf.cdc.gov>.

### Data Provisioning Services

DISO provides services that store and give access to large volumes of data. These data provisioning services can be complex because they often must integrate disjointed data that arise from multiple sources and harmonize these data into a coherent structure. This step is critical and must be accomplished before the data have any value for analysis.

DISO services include the National Electronic Disease Surveillance System (NEDSS) Common Data Store (CDS) and the BioSense Data Warehouse. NEDSS is an Internet-based infrastructure for public health surveillance data exchange that uses specific PHIN data standards. NEDSS CDS receives and processes 500,000 case notification messages per week.

BioSense tracks health problems as they evolve and provides public health officials with the data, information, and tools needed to better prepare for and coordinate responses to public health emergencies. The BioSense Data Warehouse stores data captured by the BioSense application and generates reports and analyses.

### Laboratory Informatics Services

The Laboratory Response Network (LRN) is a coordinated network of public health and other laboratories capable of testing biological and chemical terrorism agents. CDC manages and coordinates standard assays and protocols for the LRN laboratories. DISO supports the LRN through two systems. The LRN Results Messenger (RM) allows LRN laboratories to manage and securely share standard laboratory results data with public health partners. The Laboratory Information Management System integration (LIMSi) project enables laboratories to exchange data directly to and from their own LIMS systems.

### Public Health Preparedness and Response Systems

The Countermeasure Tracking System (CTS) is a program with multiple components that allow federal, state, and local public health agencies to track and manage the inventory and use of countermeasures (e.g., vaccines, pharmaceuticals, medical equipment, personal safety equipment) during all-hazards events. Components include Inventory Management (IM), Communications Portal, Countermeasure and Response Administration (CRA), and Countermeasure Inventory Tracking (CIT).

IM tracks medical countermeasure inventory. The Communications Portal consolidates important event response information in a central location. CRA monitors and tracks the administration of vaccines, dispensing of pharmaceuticals and medical material, or implementation of social distancing measures. CIT is a situational awareness tool used by CDC's Strategic National Stockpile (SNS) program to construct a nationwide inventory supply picture. These four components work together to improve public health agencies' ability to communicate and respond efficiently during emergencies.

### CDC WONDER

CDC's Wide-ranging Online Data for Epidemiologic Research (WONDER) system gives public health professionals and the general public access to CDC information resources. CDC WONDER provides statistical research data published by CDC and reference materials, reports, and guidelines on health-related topics. Public-use data sets are available for query, and the requested data can then be summarized and analyzed with dynamically calculated statistics, charts, and maps.



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## **Division Accomplishments**

DISO's key accomplishments include the following:

- DISO processes 1.5 billion electronic messages per year on behalf of many CDC programs and all state health departments. In addition, DISO has processed, packaged, and provisioned hundreds of terabytes of health data to CDC programs and the public.
- DISO developed and published the electronic messaging standards for public health for Meaningful Use Stage 1 and implemented Web-based services that allow clinical entities to validate these messages. This critical step is required before implementation of electronic data interchange.
- DISO operated the IT infrastructure that undergirds national notifiable disease surveillance, electronic laboratory reporting, syndromic surveillance, Laboratory Response Network, and multiple smaller programs.
- For the Countermeasure Tracking System project, DISO designed—by using input from state and local public health partners—and developed the CTS Inventory Management and Tracking System (IMATS). CTS is now implementing IMATS nationally.
  - » CDC's Strategic National Stockpile requested that DISO develop IMATS so that SNS could respond to a need identified during the H1N1 vaccination campaign to see medical and nonmedical countermeasures employed at all public health levels.
  - » Since the on-time and within-budget release of IMATS in October 2011, 26 state and local health departments have implemented IMATS to track countermeasures. Several states have instituted state-wide implementation of IMATS.

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