Public Health Surveillance Activities at the Division of Health Informatics and Surveillance

Miguel H. Torres-Urquidy, DDS, MS, PhD (Candidate)

Senior Service Fellow

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OUTLINE

- Informatics Activities within the National Public Health Surveillance Systems

  – National Notifiable Disease Surveillance System

  – National Syndromic Surveillance Program

Disclaimer: The findings and conclusions in this report are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

National Notifiable Diseases Surveillance System (NNDSS)

- The National Notifiable Diseases Surveillance System (NNDSS) is a nationwide collaboration that enables all levels of public health—local, state, territorial, federal, and international—to share notifiable disease-related health information.

NNDSS: Overview

- Public health uses this information to monitor, control, and prevent the occurrence and spread of state-reportable and nationally notifiable infectious and noninfectious diseases and conditions and outbreaks.

NNDSS: Overview

- NNDSS is a multifaceted program that includes the surveillance system for collection, analysis, and sharing of health data. It also includes policies, laws, electronic messaging standards, people, partners, information systems, processes, and resources at the local, state, territorial, and national levels.

NNDSS: Supporting Public Health Surveillance in Jurisdictions and at CDC

▪ Notifiable disease surveillance begins at the level of local, state, and territorial public health departments (also known as jurisdictions). Jurisdictional laws and regulations mandate reporting of cases of specified infectious and noninfectious conditions to health departments.

NNDSS: Supporting Public Health Surveillance in Jurisdictions and at CDC

- The health departments work with healthcare providers, laboratories, hospitals, and other partners to obtain the information needed to monitor, control, and prevent the occurrence and spread of these health conditions. In addition, health departments notify CDC about the occurrence of certain conditions.

NNDSS: Supporting Public Health Surveillance in Jurisdictions and at CDC

▪ The CDC Division of Health Informatics and Surveillance (DHIS) supports NNDSS by receiving, securing, processing, and providing nationally notifiable infectious

diseases data to disease-specific CDC programs. DHIS also supports local, state, and territorial public health departments in helping them collect, manage, and submit case notification data to CDC for NNDSS.

NNDSS: Supporting Public Health Surveillance in Jurisdictions and at CDC

▪ DHIS provides this support through funding, health information exchange standards and frameworks, electronic health information systems, and technical support through the NNDSS web site, tools, and training. Together, DHIS and the CDC programs prepare annual summaries of infectious and noninfectious diseases and conditions, which are published in the CDC *Morbidity and Mortality Weekly Repor*t.

NNDSS: Supporting Public Health Surveillance in Jurisdictions and at CDC

▪ These programs collaborate with the Council of State and Territorial Epidemiologists (CSTE) to determine which conditions reported to local, state, and territorial public health departments are nationally notifiable.

The CDC programs, in collaboration with subject matter experts in CSTE and in health departments, determine what data elements are included in national notifications.

NNDSS: Data Collection and Reporting

- In order for CDC to collect and use public health surveillance data, the NNDSS staff works closely with state and local health departments; experts from other CDC programs; and partners, such as the Council of State and Territorial Epidemiologists (CSTE). Together, they develop and implement consistent standards, tools, training, and technology to help ensure that disease reporting systems are integrated within each state.

NNDSS: Data Collection and Reporting

- They also help make sure that public health surveillance systems are interoperable with public health surveillance systems at CDC and other state and local health departments, as well as with health IT systems used by hospitals, laboratories, and private providers.

NNDSS: Data Collection and Reporting

▪ NNDSS provides National Electronic Disease Surveillance System (NEDSS) standards, tools, and resources to support reporting jurisdictions – state, local, territorial, and tribal health departments – to help them implement integrated and interoperable public health surveillance systems.

NNDSS: Notifiable Disease Surveillance Starts at State and Local Levels

- CDC receives case notifications from 57 reporting jurisdictions. Each state has laws requiring certain diseases be reported at the state level, but it is voluntary for states to provide information or notifications to CDC at the federal level.

NNDSS
National Notifiable Diseases Surveillance System

NNDSS: Notifiable Disease Surveillance Starts at State and Local Levels

- The notifiable diseases data voluntarily shared by these 57 jurisdictions represents a small portion of the public health surveillance data that jurisdictions collect and use to make decisions and conduct public health activities in their communities (e.g., outbreak detection and control). There are several important distinctions between a reportable disease and a notifiable disease.

NNDSS: Notifiable Disease Surveillance Starts at State and Local Levels

▪ It is mandatory that *reportable* disease cases be reported to state and territorial jurisdictions when identified by a health provider, hospital, or laboratory. This type of required reporting uses personal identifiers and enables the states to identify cases where immediate disease control and prevention is needed. Each state has its own laws and regulations defining what diseases are reportable. The list of reportable diseases varies among states and over time.

NNDSS: Notifiable Disease Surveillance Starts at State and Local Levels

▪ It is voluntary that *notifiable* disease cases be reported to CDC by state and territorial jurisdictions (without direct personal identifiers) for nationwide aggregation and monitoring of disease data. Regular, frequent, timely information on individual cases is considered necessary to monitor disease trends, identify populations or geographic areas at high risk, formulate and assess prevention and control strategies, and formulate public health policies.

NNDSS
National Notifiable Diseases Surveillance System

NNDSS: Notifiable Disease Surveillance Starts at State and Local Levels

▪ The list of notifiable diseases varies over time and by state. The list of nationally notifiable diseases is reviewed and modified annually by the CSTE and CDC. Every nationally notifiable disease is not necessarily reportable in each state.

NNDSS: Case Definitions

- A case definition is set of uniform criteria used to define a disease for public health surveillance. Case definitions enable public health to classify and count cases consistently across reporting jurisdictions, and should not be used by healthcare providers to determine how to meet an individual patient's health needs.

NNDSS: Case Definitions

▪ While the list of reportable conditions varies by state, the Council of State and Territorial Epidemiologists (CSTE) has recommended that state health departments report cases of selected diseases to CDC's National Notifiable Diseases Surveillance System (NNDSS). Every year, case definitions are updated using CSTE's Position Statements. They provide uniform criteria of nationally notifiable infectious and non-infectious conditions for reporting purposes.

NNDSS: Provisional Data

- **Provisional data** are initially collected locally as a result of state, territorial, and local legislation and regulations that require health care providers, medical laboratories, and other entities to submit data on reportable conditions to state and local public health departments. The reportable conditions vary depending upon each jurisdiction's health priorities.

NNDSS: Provisional Data

- The reporting jurisdictions voluntarily submit case notifications for the nationally notifiable conditions to CDC. NNDSS data are considered provisional and subject to change each week until the data are reconciled and verified with the state and territorial data providers to be the final official incidence counts for a given notifiable condition and year.

NNDSS: Provisional Data

- Cumulative counts of cases presented each week can increase or decrease as additional information becomes available and counts are updated. In any given year, for most conditions, cumulative provisional case counts and rates do not match finalized case counts and rates.

NNDSS: Finalized Data

- **Finalized data** are created within approximately six months after the end of the calendar year. CDC finalizes NNDSS data in collaboration with the state and territorial health department data providers and CDC program leaders for each notifiable condition.

NNDSS: Finalized Data

- Finalized counts by condition and reporting jurisdiction are published in the *MMWR* Early Release Table approximately two months after the state and territorial health departments finalize the data. In addition, finalized data are published in the *MMWR Summary of Notifiable Infections Diseases and Conditions—United States* (also referred to as the *Summary*) approximately one year after the data are published in the Early Release Tables.

NNDSS: Finalized Data

- The NNDSS surveillance data likely represent an underestimate of the true number of cases of a given condition because of under-recognition and under-reporting of disease.

NNDSS: Provisional Data

Accessible at:

- Data.cdc.gov

- CDC WONDER

- MMWR Weekly: refer to "Notifiable Diseases and Mortality Tables"

NNDSS: Finalized Data

- **Summary of Notifiable Infectious Diseases and Conditions** * MMWR: https://www.cdc.gov/mmwr/mmwr_nd/index.html

- **Summary of Notifiable Non-Infectious Disease and Conditions** MMWR: https://www.cdc.gov/mmwr/mmwr_nnc/index.html

* Only data from reporting states, territories, and jurisdictions that designated the infectious disease or condition as reportable are included in the summary tables.

National Syndromic Surveillance Program (NSSP)

- **NSSP Overview**

- The National Syndromic Surveillance Program (NSSP) promotes and advances development of a syndromic surveillance system for the timely exchange of syndromic data.

National Syndromic Surveillance Program (NSSP)

- **NSSP Overview**

- These data are used to improve nationwide situational awareness and enhance responsiveness to hazardous events and disease outbreaks to **protect America's health, safety, and security**.

National Syndromic Surveillance Program (NSSP)

- **NSSP Overview**

- NSSP functions through collaboration among individuals and organizations at local, state, and federal levels of public health; federal agencies including the U.S. Department of Defense and the U.S. Department of Veterans Affairs; public health partner organizations; and hospitals and health professionals.

National Syndromic Surveillance Program (NSSP)

- **NSSP Features**
- The BioSense Platform
- Community of Practice

NSSP: The BioSense Platform

- To support national emergency preparedness, the U.S. Congress passed legislation and appropriated funding to the Centers for Disease Control and Prevention (CDC) to establish an integrated national public health surveillance system for early detection and rapid assessment of bioterrorism-related events.

NSSP: The BioSense Platform

- To meet this need, CDC launched BioSense in 2003. Since 2011, the focus has expanded to situational awareness for all-hazards preparedness and response. The NSSP provides syndromic surveillance practitioners access to and use of the cloud-based BioSense Platform, a secure integrated electronic health information system with standardized analytic tools and processes.

NSSP: Community of Practice and Collaboration with Partners

- NSSP promotes a Community of Practice in which participants collaborate to advance the science and practice of syndromic surveillance. The NSSP Community of Practice includes CDC-funded grantees, nonfunded states and jurisdictions that contribute data to the BioSense Platform, public health practitioners who use local syndromic surveillance systems, CDC programs, other federal agencies, partner organizations, hospitals, healthcare professionals, and academic institutions.

NSSP: Community of Practice and Collaboration with Partners

- CDC works with partners to improve the timeliness and representativeness of the data that drive decision making and action. CDC funds the Association of State and Territorial Health Officials (ASTHO) to host the BioSense Platform.

- Through coordination with partners such as ASTHO, the Council of State and Territorial Epidemiologists, the National Association of County and City Health Officials, and the International Society for Disease Surveillance, BioSense Platform users provide feedback on development and use of the BioSense Platform.

NSSP: Syndromic Surveillance

- Syndromic surveillance uses syndromic data and statistical tools to detect, monitor, and characterize unusual activity for further public health investigation or response.

- Syndromic data include patient encounter data from emergency departments, urgent care, ambulatory care, and inpatient healthcare settings, as well as pharmacy and laboratory data.

NSSP: Syndromic Surveillance

- Though these data are being captured for different purposes, they are monitored in near real-time as potential indicators of an event, a disease, or an outbreak of public health significance. Public health practitioners use various surveillance systems and data sources in combination with syndromic data to enhance their understanding of events.
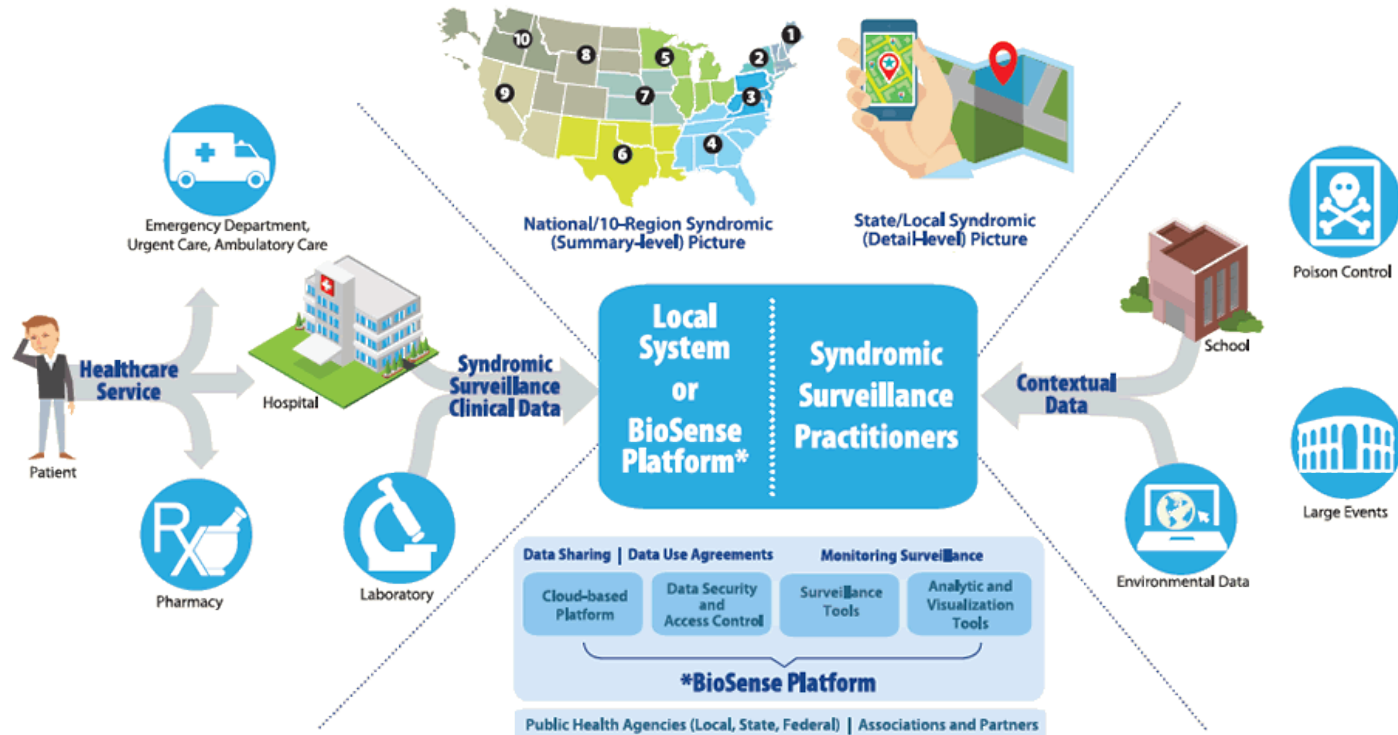
NSSP: Syndromic Surveillance

- Other data sources that provide context may include school and business absentee data, poison control reports, and even social media data that may present an emergent picture of public health events.

NSSP: Public Health Syndromic Surveillance Data Flow

NSSP: Syndromic Data in Action

- **Syndromic surveillance can improve public health situational awareness by monitoring different conditions**

- Infectious disease outbreaks and pandemics (Enterovirus D68, influenza, H1N1 flu virus, Norovirus, Zika)

- Identification of reportable conditions not found by other systems (Ciguatera fish poisoning)

NSSP: Syndromic Data in Action

▪ **Syndromic surveillance can improve public health situational awareness by monitoring different conditions**

▪ Mass gatherings (Super Bowl, conventions)

▪ Natural and man-made disasters

▪ Injury (falls, bicycle-related injuries, drownings, drug overdoses)

▪ Chronic conditions (asthma)

NSSP: Syndromic Data in Action

▪ **Syndromic surveillance can improve public health situational awareness by monitoring different conditions**

▪ Healthcare use (oral health, medication refills)

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Questions!

Contact:

Miguel Torres-Urquidy DDS, MS, PhD (Candidate)

mtorresurquidy@cdc.gov

Senior Service Fellow

Division of Health Informatics and Surveillance

Informatics Services Branch

Division of Health Informatics and Surveillance

Center for Surveillance, Epidemiology, and Laboratory Services

Office of Public Health Scientific Services

Centers for Disease Control and Prevention (CDC)

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348   www.cdc.gov

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