

## CASE STUDY

### Client:

U.S. Centers for Disease Control and Prevention

### Challenge:

Build a new module into the NEDSS Base System (NBS) to track the H1N1 virus.

### Solution:

The H1N1 module gives public health practitioners the ability to enter case reports for flu and provide data to the CDC in a standardized format.

### Results:

NBS currently covers 16 states and approximately 25 percent of the U.S. population, with over 900 users throughout the country. More than 600,000 Nationally Notifiable Disease electronic messages have been generated by NBS sites.

### For More Information:

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## *Since last year's outbreak, state health officials have been tracking the H1N1 (swine) flu virus using CSC technology.*

A new influenza module is the latest addition to the U.S. Centers for Disease Control and Prevention's (CDC) National Electronic Disease Surveillance System (NEDSS) Base System, an Internet-based infrastructure developed by CSC, for data accumulation and sharing at the local, state and federal levels.

The system provides a standards-based, integrated approach to disease surveillance for the CDC's Public Health Information Network. Because the NEDSS connects public health surveillance systems to clinical information, emerging public health threats and trends can be detected more quickly.

### Electronic tracking of disease

The influenza reporting module provides public health practitioners with the ability to quickly enter case reports for flu and a mechanism to provide data to the CDC in a standardized format, among other features of the NEDSS Base System's (NBS) evolving technology.

"Prior to the NEDSS Base System, states had to enter influenza data into a centrally located application at the CDC," says Sumesh Sundareswaran, senior program manager at CSC. "But because it was hosted at the CDC, it was difficult for states to get the data back to assist local reporting. An advantage of this system [NBS] is they can keep the data within the state's integrated data repository and can run reports and analyses easily." States also improve their workflow processes as the NBS is a repository both for the

management of state cases and for reporting to CDC. Thus the NBS obviates the need for dual data entry.

Following the outbreak of H1N1 in 2009, all CDC stakeholders, including the NEDSS, were ordered to have specific programs in place by September 2009 (just prior to the fall influenza season) to respond to this pandemic. At the same time, the messaging standards to be used by state and local health departments for reporting the virus's spread among the general population were still being developed. The challenge for software developers, such as CSC, was to simultaneously create the functions necessary to accomplish the mission as the requirements unfolded.

"We had to work with a moving target while those guides were in flux," says Sundareswaran. "The requirements kept changing every day, but we still had to keep developing and adjusting as more information about the virus became available."

"Our challenge was not only to develop the system, but also to test it so that it could go into production on time," he adds. "We hit our beta date on schedule and were able to get the release out to 16 jurisdictions to help states respond to H1N1 surveillance requirements appropriately."

### Data sharing across states

Since 2002, NBS has been offered to state health departments and other organizations for free. NBS is one of three types of systems available to states in meeting their NEDSS

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### UNDER SURVEILLANCE: TRACKING SWINE FLU IN THE U.S. (CONT.)

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*Sumesh  
Sundareswaran,  
senior program  
manager at CSC*

requirements. The other two options open to states are the purchase of a commercial off-the-shelf product or a state-developed, built-from-scratch system.

The CDC and CSC jointly developed the public health conceptual model, data standards, and software and systems infrastructure for NBS. Major technical challenges included supporting the sheer volume of data, integrating multiple disease-specific systems and addressing privacy concerns.

NBS enables data entry via the Web and allows the intake of electronic laboratory data. These features place data entry capability closer to the data source (local health departments, health care providers, hospitals, etc.), which reduces errors and speeds reporting. NBS's patient-centric model supports a virtual file that allows all public health events for a patient to be viewed from one central location. Patient demographic data is connected to health event data for over 140 different diseases and conditions.

Security is built into the system to protect sensitive information, with user security profiles determining access to data. The latest release allows NBS states to share reports with other states in the system, which no other public health information system in the country has been able to achieve, Sundareswaran says.

#### **Responding to an outbreak**

Even before the specific H1N1 module was completed, the NBS proved

flexible enough to gather data on the spring 2009 outbreak that had originated in Mexico. At the center of that rapidly developing public health emergency was Texas, an NBS state. As the epidemic unfolded, Texas was able to configure the NBS to not only respond quickly but to share the framework for response with other NBS states. The Texas Department of State Health Services (TXDSHS) utilized the system option to take locally-formulated questions and turn them into fields for information capture.

“Within hours of Texas having the system configured, and before any of the other 15 NBS states had a swine flu case confirmed, we had shared the work we had done with the NBS. Other states had the option of simply plugging-and-playing the locally defined fields to have a well-thought-through minimum data capture for this outbreak if or when it occurred in their state,” says Doug Hamaker, NEDSS Coordinator for TXDSHS.

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When patient information, including lab reports, is gathered electronically, epidemiological investigations are initiated much more quickly. Reporting time for communicable diseases in NBS states, for example, has shrunk from around 24 days to three days, with a 300 percent increase in the number of laboratory reports sent to public health through the NBS.