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Public health smartens up

CDC's National Center for Public Health Informatics aims to help public health organizations prepare data-handling systems for a national health information exchange

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Like many public health organizations, Nebraska's Health and Human Services Department relied for years on faxes and telephone calls to collect field reports on contagious diseases. But then officials decided to adopt the emerging discipline of public health informatics, hiring a team of specialists and turning to the Centers for Disease Control and Prevention for additional help. It relied on that expertise when it began implementing the National Electronic Disease Surveillance System (NEDSS), a CDC-developed, Web-based system for monitoring reportable diseases.

That knowledge came in handy this past winter when Nebraska, like a number of other Midwestern states, was hit by a sudden and unexpected outbreak of mumps. Initially, as reports came in, health officials were trying to determine whether patients suspected of having mumps actually met the classic definition, because some physicians were reporting confusing lab test results while others were making diagnoses based solely on the presence of swollen salivary glands.

The new state informatics team, however, was able to modify the data-collection effort through NEDSS to capture risk factor information and vaccine history more effectively, enabling health officials to identify true cases and get the outbreak under control.

"The informatics folks from CDC were invaluable in helping us figure out how to integrate automatic electronic laboratory reporting into the base system and how to extract data in a way that was intuitive and useful for public health workers," said Dr. Thomas Safranek, state epidemiologist for Nebraska's Health and Human Services Department. "They provided a tremendous amount of technical support, and most importantly, they taught us how to work the system ourselves." The investment paid off. The accuracy, speed and ease of the reporting capability helped keep the outbreak to just 250 cases, with no fatalities.

CDC is now looking to provide similar knowledge transfer and support to other public health organizations. Last October, the agency created the National Center for Public Health Informatics (NCPHI), centralizing all of its informatics specialists under a single umbrella.

Initially, the organization is expected to raise the visibility of public health informatics, which it defines as the systematic application of information and computer science and technology to public health practice research and learning (see "What is informatics?" at right). Although medical informatics has been around for years and is considered relatively mature, public health informatics is still in its adolescence.

Dr. Thomas Savel, medical officer in the Office of the Director at NCPHI, said the decision to formalize informatics evolved from CDC's efforts to deal more effectively with bioterrorism and global pandemics. "Right now, we've got clinical care and public health, but the push is to make those two areas much more seamless," he said. "As we start building national standards and linking organizations together towards a federal health architecture, we want to make sure that public health is ready."

NCPHI's most critical role will be to help federal, state and local agencies use informatics to develop systems that are interoperable, integrated and more intuitive. "We're here for anyone who needs us, and our whole purpose is to help them in any way we can," Savel said.

The key to public health care

How that help will manifest itself in the real world is still being worked out. Among the possibilities: setting national standards for interoperability, security and data terminology; providing in-field consulting expertise and training; providing guidance on strategic initiatives; helping procure funding; and setting assessment metrics for workforce capacity.

And, of course, NCPHI could help state and local agencies develop their own versions of CDC-developed programs such as NEDSS and the Public Health Information Network.

“This is a hugely important step because informatics is the key to how public health is going to get done in the future,” said Lawrence Hanrahan, director of public health informatics and chief epidemiologist at the Wisconsin Department of Health and Family Services’ Division of Public Health. “We can see that with every passing day operations are revolving around defining, creating, procuring, installing and maintaining public health systems, so it’s really important to have national leadership to guide us through a field that admittedly public health doesn’t have a lot of experience in.”

That lack of knowledge, skills and perspective is especially obvious at the local and state levels. Although its mission is critical, public health as a field has not gotten the attention or the funding necessary in recent years to keep its information technology infrastructure on par with clinical systems. Most systems are incompatible and lack the ability to provide decision support or link program data.

“We have a lot of data in public health but, unfortunately, not much ability to turn that data into usable information and knowledge,” said Martin LaVenture, director of public health informatics at the Minnesota Department of Health.

An IT and health care bridge

For this reason, public health officials at all levels of government are beginning to embrace public health informatics. The Minnesota Department of Health, for example, recently established its own center for public health informatics to direct and coordinate strategic-level initiatives and provide aid to local agencies.

“We see public health informatics as the bridge between information technology and public health,” LaVenture said.

But most states need more sophisticated management of informatics, largely because they face unique challenges, Savel said. For starters, public health agencies have to collect a wide variety of data and information, including data involving clinical care, lab results, environmental factors and animal diseases, which involves a variety of public health stakeholders and data streams from separate entities.

“Dealing with population data is different than individual case data,” LaVenture said. “We run into analysis complexities and presentation complexities. And there are all kinds of issues with data quality and data definitions when you’ve got multiple sets of data.”

Even people in the public health community who rely on sophisticated information systems in their day-to-day tasks are challenged by interoperability problems. Patina Zarcone, director of strategic initiatives and research at the Association of Public Health Laboratories, said that for all their expertise in testing and developing critical data, labs have struggled to develop systems that can manage large volumes of data and exchange it with key decision-makers at the right moment.

“Data really drives interventions, treatment and preparedness, so I think it’s critical that CDC is now standing up a center focusing on informatics that can help public health organizations improve the management [of], access to and exchange of data,” Zarcone said.

LaVenture sees NCPHI as the answer to a major resource issue at the state and local levels: people power. Just as CDC’s Epidemiology Intelligence Service trains epidemiologists and then loans them out to different states for field training or to help during outbreaks, he said, NCPHI could play a similar role for informatics.

An integrated approach

Savel also sees NCPHI providing that service, noting that the center has been set up to maximize its ability to help various aspects of public health. The organizational structure includes a Division of Emergency Preparedness and Response, a Division of Knowledge Management and Collaboration, a Division of Integrated Surveillance Systems and Services, a Division of Informatics Shared Services, and a Division of Alliance Management and Consulting.

For example, a first responder agency can contact the Division of Emergency Preparedness and Response to learn about standards NCPHI is developing and what tools might already be available to help resolve whatever issues the agency faces.

“If there’s a public health agency that needs help with regard to any sort of informatics issue — no matter how small — and we don’t help them, then I would say we aren’t doing our job,” Savel said.

Ultimately, he said, NCPHI’s goal is to work with the various public health players to speed the development of integrated systems across both the public health and clinical communities so public health agencies can determine what’s going on in the community more quickly and then act to protect the health of the U.S. population.

“We want to do our part to facilitate the reality of a national system much more quickly than it would happen otherwise,” Savel said. “If we do that, we’ll make sure that the right information is seen by the correct people, that they’ll have access to that information exactly when they need it and then, obviously, they’ll be able to take action sooner. That’s the vision everybody would like to achieve — sooner rather than later.”

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