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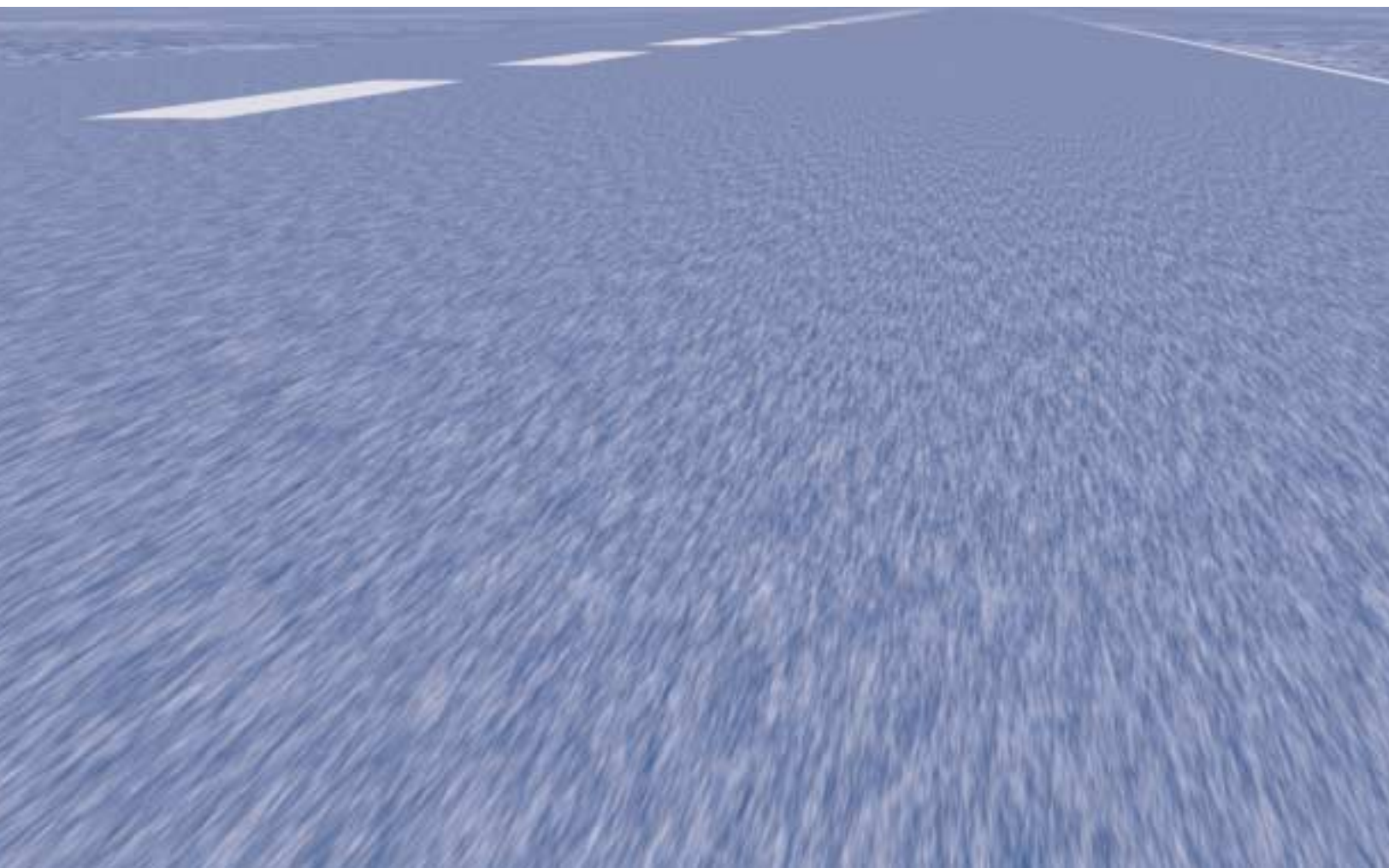
Information Technology and Public Health

The Crossroads of Change



The challenge for our times is redefining public health as an enterprise organization.

Leveraging Technology in the Public Health Enterprise

NACCHO NATIONAL ASSOCIATION OF COUNTY & CITY HEALTH OFFICIALS

Leadership in Information Technology for Public Health

By Dave Ross, ScD, Director, Public Health Informatics Institute, and Terry Marie Hastings, Communications Director, Public Health Informatics Institute

The events of September 11, 2001 brought a new reality to public health agencies. To fulfill their mission of collectively assuring the conditions in which people can be healthy, public health must have seamless communications not only with state and federal public health agencies, but also with agencies outside of public health—health care delivery systems, health care providers, emergency responders, other community agencies, businesses and more. In short, to perform its mission, public health must be re-defined as an enterprise organization—a group of independent but interrelated elements comprising a unified whole.

This realization has coincided with significant advances in information technology. Like many previous scientific and technological advances, information technology has the potential to profoundly change public health. Specifically, it holds promise as a tool to assist public health leaders in transforming public health into an enterprise in which the key players—including local public health agencies—act in a seamless, concerted, and strategic way to promote and protect the public's health.

A Catalyst for Change

Historically, technological advances have provoked new policies, new programs, and new dimensions in the mission of public health. Many kinds of technologies are responsible for today's public health practice environment. For example, the mere existence of a practical vaccine to protect against an infectious disease requires that policy makers

support a commensurate immunization program. Without a vaccine, we need not bother with supporting an immunization program. Information technologies have provoked similar public health policy changes. The invention of computing machines made national level statistical surveys possible. When national health information survey data demonstrated the shifting morbidity and mortality burden due to chronic diseases and injuries, policy makers were provoked to support new programs. Dr. John Lumpkin's chapter on the history and significance of information systems in public health explains this technology push/policy response dynamic by following the evolution of counting machines to computers to the integrated state public health systems of today.[1]

Putting the System Back in Public Health

The recognition that a unified, strategic approach to public health is required is not new. The 1988 IOM study *The Future of Public Health* made recommendations for local, state, and federal agencies to correct a system of public health activities that had fallen into "disarray." Its authors noted that while public health is a large, complex, socially important service enterprise, "Public health responsibilities have become so fragmented that deliberate action is difficult if not impossible."[2]

In the subsequent 15 years, significant progress was achieved in changing public health from a compilation of individually administered activities to an integrated enterprise—a system—operating for the benefit of the public. Yet *The Future of the Public's Health in the 21st Century*, issued by IOM in the wake of Sept. 11 as an update to the 1998 book, reaffirms the concept of a "public health system"—a complex network of individuals and organizations that, when working together, can represent "what we as a society do collectively to assure the conditions in which people can be healthy." It describes the rationale for multi-sector engagement in partnership with government, and it reaffirms the need for a systems approach to assuring the nation's health in practice, research, and policy. Its recommendations focus on the need for the diverse sectors that share responsibility for the public's health to work in a concerted, strategic way.[3]

The Operative Word

Information technology, which has made notable advances in accelerating enterprise views of other industries (e.g., finance and telecommunications), has the potential to serve as an agent to accelerate a strategic, enterprise approach to the practice of public health and to ensure that all the key players participate fully.

Significant progress in development of data standards—the common language that enables information to be shared across organizational and jurisdictional boundaries—for public health and health care has made interoperability of information systems possible.

Earlier this year, three federal departments that deliver health care services—Department of Health and Human Services, Department of Defense, and Veterans Affairs—announced the first set of uniform standards for the electronic exchange of clinical health information to be adopted across the federal government. These three agencies are coordinating with numerous other federal agencies to standardize across federal clinical health information as part of the Consolidated Health Informatics initiative (CHI), one of President Bush's eGov initiatives.

Building on these technological advances, major national initiatives are underway to develop health information systems that improve the effectiveness, efficiency, and overall quality of health and health care in the United States. The most encompassing of these is the National Health Information Infrastructure (NHII) initiative, which proposes a network of interoperable systems encompassing clinical, public health, and personal health information. Within the sphere of public health, the Centers for Disease Control and Prevention (CDC) is developing the Public Health Information Network (PHIN)—a framework for cross-cutting and unifying data streams that enable the early detection of public health issues and emergencies. PHIN encompasses the Health Alert Network (HAN), a program to ensure communications capacity, including full internet connectivity and training, at all local and state health departments; the National Electronic Disease Surveillance System (NEDSS), an initiative that promotes the use of data and information system standards to advance the development of efficient, integrated, and interoperable surveillance systems at federal, state and local levels; and Epi-X, a secure, Web-based system for sharing health surveillance information among local, state, and federal agencies.

Having a Voice in the Public Health Enterprise

Public health practitioners in local public health agencies, especially those in less populous locales, may wonder whether they have a "voice" in the public health enterprise. With relatively small populations, staffs, and budgets, how can they be heard?

The answer lies in their access to the health information about the communities they serve. Information technology is the tool that local public health agencies can leverage to have a voice in the enterprise.

By definition, all the parts of the public health enterprise must participate fully. To be effective, the public health enterprise requires comprehensive access to data across geographic and jurisdictional boundaries—local, state, federal, health care industry, community and business partners. The 3,000-plus local public health agencies in the U.S. are an essential link for gathering data from health care providers, other government and community agencies, and business partners, and an essential conduit for disseminating information to these partners so that they may act to protect the public's health. Access to this information makes local public health agencies highly desirable partners in the public health enterprise.

So how can local public health agencies become full–fledged, active members of the enterprise? Here are three "must do's" for local public health leadership:

- **Take initiative.** Reach out to establish effective relationships with all stakeholders—local, state, and federal government agencies, and non-governmental stakeholders and partners. An "organizational handshake" must precede the "digital handshake"—the electronic exchange of data between two organizations.
- **Be informed about information technology.** Seek to align your agencies' information technology initiatives with your strategic priorities and with national enterprise initiatives, such PHIN, and state initiatives that seek to integrate health information.
- **Participate in the process.** Your local public health agency must have a voice in the development of national data standards and information systems developed for the public health enterprise. Actively participate, or ensure your information technology staff participates, in organizations developing standards that will shape future public health information policy.

While it is a challenging time for public health, opportunities exist as never before for public health leaders to ensure their agencies are essential partners in the public health enterprise.

Resources

National Association for Public Health Information Technology (NAPHIT): a national non–profit organization that provides leaders in public health information technology with a venue to exchange ideas and experiences, discuss and shape current public health information policy, and learn about tools and technologies that help them better support public health.
www.naphit.org

National Health Information Infrastructure: A voluntary initiative to develop an action plan for a comprehensive knowledge–based network of interoperable systems of clinical, public health, and personal health information that would lead to improved decision–making by making health information available when and where it is needed.
http://aspe.hhs.gov/sp/nhii/index.html

Public Health Informatics Institute: A nonprofit organization dedicated to advancing public health practitioners' ability to strategically apply and manage information systems.
www.phii.org

Public Health Data Standards Consortium (PHDSC): A voluntary consortium of public and private sector organizations with a common interest in developing, promoting, and implementing data standards for public health and health services research. PHDSC collaborates with state, federal, and private sector organizations to ensure that these efforts are appropriately integrated with broader health data standards development efforts.
www.phdsc.org

Consolidated Health Informatics:
Learn more from these sites.
www.whitehouse.gov/omb/egov/gtob/health_informatics.htm

http://metadata–stds.org

Footnotes

(1) Lumpkin, J. 2003. Chapter 2: History and Significance of Information Systems and Public Health. In O'Carroll P, Yasnoff W, Ward E, Ripp L, and Martin E (Eds.). Public Health Informatics and Information Systems. New York: Springer–Verlag.
(2) IOM (Institute of Medicine) 1998. The Future of the Public Health. Washington, DC: National Academy Press.
(3) IOM, 2003. The Future of the Public Health in the 21st Century. Washington, DC: National Academy Press.

Data Standards and Local Public Health

By Kathleen Cook, BSN, Information and Fiscal Manager, Lincoln-Lancaster County (NE) Health Department

The new mantras for local public health information technology development are "Integrated Data" and "Knowledge Management." But what are these concepts and how do you accomplish them? It seems like an impossible task to integrate all the databases and applications used by local public health agencies. Even the promise of the National Electronic Disease Surveillance System (NEDSS) will only integrate a portion of the data requirements facing us. How can we possibly develop data applications that can meet all the present and future requirements from state, federal and other sources? Frustration reigns!

At the heart of the solution are data standards. If the same information is collected, recorded, and exchanged in the same way everywhere, then it can be integrated. *How do you get started?* It is quite easy to get bombarded—even buried—in the acronym onslaught from the merger of information technology and public health: HIPAA, XML, HL7, EHR, ASCII, ANSI, PHDSC, LOINC, SNOMED, UMLS, ASC X12, SDO, NUBC, NUCC.[1] Behind each of these is a deep well of complex, technical knowledge and information. The task of understanding and using the information practically at the local level can be daunting.

Data standards are the common language that allows information to be shared and compared across individual data systems, electronically linked in a secure environment

and presented in ways that are clear and relevant.[2] In local public health agencies, data are collected and recorded continuously. The data are maintained in paper and electronic files and systems. Data alone is of very little use. Piles and piles of unorganized data are less than useless, creating a liability and in paper format even a physical hazard. Information is acquired as data is compiled and organized. We can't compile and organize data if we don't have data standards.

Data standards are the most basic building block for knowledge management. Managing information effectively and wisely is critical to knowledge management. Knowledge management is how we use the tools of data standards and information systems to carry out the essential functions of public health. Seth Foldy discusses knowledge management and public health in another article in this publication.

Every data collection form includes at least a minimum standard for how the data will be collected and recorded. For example, a birth record for vital statistics includes data elements such as date of birth, mother's name, father's name, and so on. Some definition is always given to the person collecting the information so that they know whether, for example, the mother's name is her maiden name or married name.

It is the need to manage information within and across organizational and jurisdictional boundaries that drives the broader standardization process. On a national and international level, specific Standards Development Organizations (SDOs) have been delegated the responsibility to set industry-wide data standards. These organizations are responsible for managing a review and consensus process prior to publishing a standard. The review process includes lengthy comment periods and consensus activities that involve industry representatives, professional associations, consumer groups, government agencies, vendors and others. Health Level 7 (HL7) and Systematized Nomenclature of Medicine (SnoMed) are two of the SDOs that publish standards that affect public health.[3]

What makes data standards useful? *Data standards are essential: 1) to combine and compare information; and 2) to the exchange of information.* In public health, data standards are critical to fulfilling our core functions of assessment, policy development, and assurance. Local public health departments analyze vital statistics, risk behavior, hospital discharge, injury and multiple other sources of data that allow them to assess the health status of their community. These data sets are generated by numerous different entities within the local community. Without data standards such as the International Classification of Diseases (ICD) and National Committee on Vital and Health Statistics (NCVHS) guidelines,[4] this data would not be analyzable. Without national data standards, comparisons of a local communities health status with that of state or nation would be impossible.

Funding entities are requiring that agencies use data standards to request reimbursement for services, report activities and receive funding. With the advent of Health Insurance Portability and Accountability Act (HIPAA)[5] transaction codes, proprietary software must incorporate standard transaction codes and be able to support standard electronic data interchange (EDI).[6] Funders including the Federal Centers for Medicare and Medicaid, Centers for Disease Control and Prevention, and the Environmental Protection Agency are pushing for data standardization.

How do you negotiate the maze of standards, standard setting organizations, resources to identify the data standards that a local health agency can incorporate into data applications and systems?

Make selection of data standards part of the methodology used to analyze and develop all new information technology applications. Incorporate data standards as a requirement in any Request for Proposals (RFP) or contract for new information systems.

To develop any information system or application, it is necessary to identify the purpose of the application, the data that must be collected, define the data elements and the parameters to be used in creating data fields, mapping the data fields to data collection forms and screens and to desired outcomes of reports. Rather than spending the time to create locally the data fields, definitions and field parameters, use the most appropriate national data standard.

Application	Data Standard Resources	Web Site
Birth records	National Committee on Vital and Health Statistics (NCVHS)	www.cdc.gov/nchs/nvss.htm
Immunization Registry	Immunization Registry	www.cdc.gov/nip/registry
Reportable Diseases	Public Health Information Network (PHIN)	www.cdc.gov/phin
Air Emissions	Environmental Information Management System	www.epa.gov/eims
Clinical Record System	PHIN, HIPAA transaction codes, National Center for Health Statistics (ICD)	www.ncvhs.hhs.gov www.cms.gov/hipaa
Food Inspection and Permitting	Food and Drug Administration	www.cfsan.fda.gov/~dms/foodcode.html www.cfsan.fda.gov/~lrd/haccp.html

What data standard do you need to use? *Ask questions.* What state and national entities does the local health department interact with by submitting reports; requesting reimbursement; or exchanging data? What changes do you know will be coming? Is the local health department a hybrid or covered entity under HIPAA? For the specific application being developed with what other entities will the information be shared? What are the current legal requirements for information sharing that apply to this application? The table below gives some suggestions and resources regarding data elements and standards related to specific types of applications.

Each of the data standard resources identified may have more data elements and more detail than is practical to implement in a local health department. Mapping the data is a tool that can be used to select the data elements from the data standards model. In the development of the National Electronic Disease Surveillance System (NEDSS),[7] CDC mapped the data elements to various data standards. An example of mapping can be found on their website. The National Association of Health Data Organizations has a tutorial, guidelines, and tools that can be used for data encounter systems.[8] Questions to consider when reviewing the resulting table or data mapping: Are there data elements missing? Do some of the data elements from the data model include too much detail to be practical or useful? Are there any conflicts with other reporting requirements?

If the data element in the data model has too much detail, must you use all of it to remain compatible? No, you can adjust the granularity or delete response options. Race is an example where you might adjust the granularity, capturing the highest level of information (or the minimum required): Caucasian, African American, American Indian/Alaskan native, Asian, and Native Hawaiian/other Pacific Islander. The code set for race includes a break down of tribes and national origin as well as ethnicity. An example of reducing response options is person name. In the NEDSS base system, the options for type of name for an individual person include such data elements as: adopted name, alias, coded pseudo, indigenous/tribal, legal, name at birth. For our department application, we selected legal and alias for type. If we exchange data with the

state NEDSS we will map the legal name to type: legal and the alias to type: alias (in our system all name types except legal would be type: alias).

It is very important that local public health have a voice in the review and development of data standards. It is important to the local departments because in time the local department will have to implement the standards. But local public health input should be even more important to the national and state entities mandating the standards. The local health department will be the end user for collecting the data and following the standard. While it is not practical for most local public health agencies to actively participate in all the different standards setting processes, they can use their participation in national associations such as NACCHO. NACCHO, through the Information Technology Committee, has actively participated in initiatives such as NEDSS, Public Health Data Standards Consortium (PHDSC), and the CDC Information Council.

The Public Health Data Standards Consortium currently has workgroups exploring: External Cause of Injury (E-codes); Health Care Service Data Reporting Guide; National Health Information Infrastructure; Payer Type; Privacy, Confidentiality and Data Sharing; and Web-based Resource Center. Most of the work is accomplished through conference calls and e-mails. Any local department who is interested in participating in a work group can join that group by registering online at www.phdatastandards.info/about/join.htm.

Build the bridge for your health department from data to knowledge.

For more information on data standards, contact Kathy Cook, Information and Fiscal Manager, Lincoln-Lancaster County Health Department, (402) 441-8092, e-mail kcook@ci.lincoln.ne.us.

1 Health Insurance Portability and Accountability Act of 1996 (HIPAA); Extensible Markup Language (XML); Health Level 7 (HL7); Electronic Health Record (HER): American Standard Code for Information Interchange (ASCII); American National Standards Institute (ANSI); Public Health Data Standards Consortium (PHDSC): Logical Observation Identifier Names and Codes (LOINC); Systematized Nomenclature of Medicine (SNOMED); Unified Medical Language System (UMLS); Accredited Standards Committee (ASC) X12 ; Standards Development Organizations (SDO); National Uniform Billing Committee (NUBC); National Uniform Claim Committee (NUCC).

2 Public Health Data Standards Consortium: _Orientation to the Public Health Data Standards Consortium; http://phdatastandards.info, September 30, 2003.

3 HL7 = Health Level 7 (www.hl7.org); SnoMed (www.snomed.org)

4 ICD = International Classification of Disease (www.cdc.gov/nchs/about/otheract/icd9/abticd9.htm), NCVHS = National Committee on Vital and Health Statistics (www.ncvhs.hhs.gov)

5. HIPAA = Health Information Portability and Accountability Act (www.cms.gov/hipaa)

6 EDI = Electronic Data Interchange standards (www.x12.org)

7 National Electronic Disease Surveillance System "Data Models and Vocabularies" www.cdc.gov/nedss/DataModels/index.html

8 National Association of Health Data Organizations, "Health Data Standards Reporting Guide" www.nahdo.org/project/index.asp

Health Alert Network (HAN)s at the State and Local Level

NACCHO NATIONAL ASSOCIATION OF COUNTY & CITY HEALTH OFFICIALS

HAN at the Local Level

By Matthew Stefanak, Health Commissioner, Mahoning County (OH) Health District

In the course of a meningococcal disease outbreak in 2001 in Mahoning County, we learned just how important it is to keep primary care physicians (PCP) in the community informed. PCP's were as much on the front lines of our outbreak response as public health workers—many were besieged with patient requests for unnecessary prophylaxis and vaccine. They needed the latest and best information to counsel their patients; we couldn't get it to them in time.

Thanks to federal bioterrorim funding, we've developed a Health Alert Network broadcast fax capacity that reaches 747 physicians and veterinarians in Mahoning County and surrounding communities. (We learned from the raccoon rabies epizootic that veterinarians are part of the public health infrastructure, too!) We provide the content of each broadcast fax as an electronic document to our contractor, the Little Blue Book Company. This company maintains Physician MasterFile, an up-to-date listing of all practicing physicians in the area. Our cost for a two-page fax to all recipients in the Health Alert Network is approximately $300.

Since creating this network, we've used it to remind physicians about disease reporting requirements, transmit our annual summary of reportable diseases in Mahoning County, and provide just-in-time SARS case definitions and patient triage guidelines. One of our broadcast fax communications is shown here as an example of the communication potential of a local HAN.

For more information on Mahoning County's HAN, contact Matthew Stefanak at (330) 270-2855, MStefanak@mahoning-health.org.

Mahoning County Public Health Readiness Initiative

District Board of Health • Youngstown City Health District • Struthers City Health District

February 3, 2003

Dear local Health Alert Network member:

As you are probably aware, local officials have spend the last several months planning to vaccinate public health and hospital response teams against **smallpox**. I anticipate that the U.S. Centers for Disease Control and Prevention will approve our vaccination plan this week and we will begin to vaccinate about 100 response team members at the District Board of Health, Saint Elizabeth Health Center, and Forum Health Northside Medical Center shortly thereafter.

As this first phase of the smallpox vaccination campaign unfolds, we expect that you will receive many inquiries about the vaccine from patients and community members. **The CDC does not recommend smallpox vaccination for the general public unless there is an outbreak of disease.** In fact, the vaccine is not available for administration to the general public, although the President has said that it will be made available sometime in 2004 to any member of the public who insists on receiving it. In counseling patients about the vaccine, we recommend stressing that the vaccine risks outweigh any benefits in the absence of disease exposure. Response team members are all volunteers who are willingly accepting the risk of vaccination—without any immediate benefit to themselves—in order that they may care for smallpox victims and control any bioterrorist release of smallpox should it occur. **Guidance for clinicians caring for vaccinated response team members with adverse reactions is available from the CDC by calling 877-554-4625 toll-free.**

The District Board of Health has recently redesigned its website to make the latest information about smallpox and other emerging disease concerns more accessible. For the latest information about smallpox and the smallpox vaccination campaign, click on the scrolling news bar on the homepage at www.mahoning-health.org.

The District Board of Health has upgraded its **communicable disease reporting warm line.** The warm line can now be used to leave communicable disease reports evenings and weekends for patients from any health district in Mahoning County. Simply call 330-270-2855 and the phone system will prompt you to leave a voice mail message in the appropriate mailbox. Your voice mail will activate the Health Alert Network pager assigned to a duty officer in each of the three Mahoning County health districts. Please note that the City of Campbell has abolished its health department. **As of January 1, 2003, the District Board of Health has assumed responsibility for disease investigations in Campbell.**

Finally, we are welcoming over 40 local veterinarians to the more than 700 members of our local Health Alert Network who receive these periodic alerts.

Matthew Stefanak
Mahoning County Health Commissioner

50 Westchester Drive
Youngstown, Ohio 44515
330-270-2855
FAX: 330-270-9194
www.mahoning-health.org

The Texas HAN

By Amy Pearson, Texas Association of Local Health Officials

In the summer of 1999, the Texas Association of Local Health Officials (TALHO) recognized bioterrorism as a viable threat. With federal funds from the Centers for Disease Control and Prevention (CDC), supplemented by money from the Texas Telecommunications Infrastructure Board, the Texas Health Alert Network (HAN) was born.

In July 1999, TALHO representatives told the Texas Telecommunications Infrastructure Board (TIFB) that telecommunications technology could play an active role in disease surveillance. They also stressed that technology is critical in the early detection of a covert bioterrorist event. Although not immediate, the Texas Telecommunications Infrastructure Board ultimately released a special request for proposals to support the Texas HAN. A collaborative of 64 local health departments applied for and received a grant of $3.78 million. They were able to use the majority of the initial $744,655 received from CDC to provide the local match required for Texas Telecommunications Infrastructure Board funding. Local health departments, through TALHO, run the Texas HAN.

TALHO hired an executive director, Lee Lane, to assist with the management of the association and the Texas HAN. Lane suggested that the Bell County Public Health District step in as fiscal agent and assist in completion of the project. The suggestion was approved, and the Bell County Public Health District became the fiscal agent for the project. Continuation of the project began with the assistance of additional personnel.

The events of September 11, 2001 highlighted the necessity for the Texas Health Alert Network; the state subsequently received a CDC grant of $51 million. With the assistance of Lane and other

health department personnel, $3 million of this went to support the HAN directly through TALHO. Additionally, $36 million was allocated to counties within the state based upon a formula of a $20,000 base and $1.48 per capita.

Texas HAN's purpose is to disseminate health alerts associated with bioterrorism events and to deliver distance–learning programming associated with bioterrorism awareness, detection, and response. The network now links some 70 state and local health organizations, carrying video and data communications. TALHO has begun work on internetworking existing Texas Telecommunications Infrastructure Board funded assets, including the University of Texas Health Center at Tyler's NETnet, the University of North Texas Health Science Center, School of Public Health, Texas Education Agency, and the Texas Organization of Rural and Community Hospitals.

Integration at the local level has begun as well. As a prototype for the state, Bell County Public Health District is implementing a Bell County Health Alert Network. They are using a Texas Telecommunications Infrastructure Board healthcare grant to connect six health district offices. These offices in turn will be connected to the Texas Telecommunications Infrastructure Board community network BellNet. This will provide connectivity via wireless, cable, and fiber optic links to a great majority of the county's emergency management department. Additionally, Department of Justice funding will provide the health district with twelve 800 MHz trunked radios that will give the Bell County HAN reliable emergency communications to all first responders in the county. This model can be duplicated in other counties to provide at least 90 percent coverage of a local health alert network to the county's residents.

TALHO is currently assisting with the funding of six automated disease surveillance pilot projects in Texas that will search hospital databases for hidden signatures of bioterrorist events or infectious disease outbreaks. The results of these pilots will be turned over to the Texas Department of Health for incorporation into a future Texas version of the National Electronic Disease Surveillance System. Ultimately, every community in Texas should be covered by an automated disease surveillance system.
Texas Governor Rick Perry has recognized the Health Alert Network as an integral part of Texas' Homeland Security. In a press release, Perry stated:

"The Health Alert Network is a powerful communication and diagnostic tool that will help state and local health–care authorities react quickly and effectively to any situation. I want to commend Senator Shapiro, the Texas Department of Health, the Texas Association of Local Health Officials, and the many others who have long supported this project. Thanks to their hard work, our state is more secure and better prepared than ever before."

Additionally, Lieutenant Governor David Dewhurst has participated in press conferences supporting the Texas HAN; Senator Florence Shapiro received the TALHO Legislator of the Year award for her support of and contribution to securing funding specifically for the Health Alert Network. TALHO and the Texas Health Alert Network have received national recognition, including articles in the Journal of Homeland Security, Computer World, Federal Computer Week, Government Technology, Washington Technology, and others. The Texas HAN was not only a winner of a 2002 Best of Texas Award presented by the Center for Digital Government, but was also chosen to receive the overall Excellence in Technology award as the collaborative project that exemplifies the very best of Texas information technology.

For more information on the Texas HAN, contact Amy Pearson at (512) 528-9691, apearson@texashan.org.

Web Site of CDC Resources for Local Public Health

A Centers for Disease Control and Prevention (CDC) Web site, "Local Health" has been developed to provide one stop access to recommendations and resources pertinent to local health departments and thus improve the practice of public health at the local level.

"Local Health" can be found under "New Features" on the CDC Recommends Web site (which has a link in the left column of the CDC home page above *MMWR*) or accessed directly at www.phppo.cdc.gov/dphsdr/Localhealth/Index.asp.

Thanks to the NACCHO IT Committee, "Local Health" was previewed in November 2003 by a small number of local public health agencies from across the country, and is now available for public use. Maintained by CDC, the site provides up–to–date links to CDC resources, to other government Web sites, and to additional useful information. The site includes categories focusing on Health, Communication, Funding, Community, Evaluation, and Training.

Recently CDC added a Spotlight feature, which contains the current month's highlights and a preview of the next month's highlights. These are based on public health calendar items from the site's Communication section, such as Breast Cancer Awareness Month, or on current health events in the news.

The next planned addition is a section that features promising practices in local public health.

To contribute ideas for links, or articles for inclusion under the upcoming promising practices section, e-mail RBhatt@cdc.gov.

CDC looks forward to furthering its partnership with NACCHO in providing and organizing online materials to advance the practice of public health at the local level.

Geographic Information Systems for Local Public Health Departments

By Alan Melnick, MD, MPH, Health Officer, Clackamas County (OR) Health Department

Although local and state governments routinely collect health data, local health officials and their community partners often fail to use these data effectively for several reasons. Because many different agencies maintain data in various formats at the local, state, and federal level, they are not available in one convenient, accessible location. In addition, counties often contain diverse communities whose borders do not coincide with other political boundaries and whose characteristics are not captured accurately by summaries based on these boundaries. Data presented at the county and state level fail to address these concerns and consequently are not useful for community health assessment and planning.

Geographic Information System technology can revolutionize the process of community health assessment by making health data more accessible, localized, and community-based. As such, GIS can be a tool for community health planning while helping evaluate public health interventions at the neighborhood level. The strengths of GIS technology include its flexibility in defining community, its relational and overlay features allowing incorporation of multiple data sets, and its ability to transform complex data into easily understandable information in a visual format. GIS technology has become available in the past two decades due to rapid improvements in computer hardware and software. Knowledge of GIS technology is now essential for public health officials at all levels. Objective 23-3 of *Healthy People 2010* is to promote nationwide use of geographic information systems at all levels.

As long as health data contain address information, health officials can analyze and map the data at sub-county or sub-city, neighborhood levels. Typical health-related data include census data (essential for mapping rates), vital statistics data, communicable disease data, registry data (cancer, immunization, injury), WIC data and morbidity data (Medicaid, ambulatory clinic). Local health officials can add environmental data, such as Environmental Protection Agency toxic release inventory data. They can also look to less traditional data sources, such as law enforcement data (arrests), high school dropouts, survey data (such as the Youth Risk Behavior Survey), location of licensed alcohol outlets and domestic abuse reports.

The Clackamas County Community Health Improvement Mapping Engine (CHIME), developed by collaboration between a county health department and the county information services (IS) department, is an example of a user-friendly, county intranet-based geographic information systems application that can easily be developed by other local health departments. Besides providing GIS expertise, the IS department supplied the spatial data (digital maps) essential for mapping health data. Using readily available data sets, CHIME can analyze and map health conditions at the neighborhood level, defined by high school attendance area. Health indicators include teen birth rates, prenatal care adequacy, communicable disease incidence, proportion of breast and colorectal cancer cases diagnosed early or late, utilization of and access to primary care, proportion of WIC infants breast fed, and immunization rates. The ability to map these indicators is helpful in planning and evaluating public health efforts, such as enhanced health education outreach to neighborhoods with high proportions of late diagnosis of breast cancer or low immunization rates.

All technological tools have limitations. With GIS, data quality, data availability, the absence of a trained workforce, and costs can pose problems. One solution is to collaborate vertically as well as horizontally, such as working with state partners to improve data quality and obtain the appropriate data, and working with other county agencies to spread the costs and obtain programming expertise. Another significant limitation includes the risk of violations of confidentiality. Potential solutions include incorporating safeguards to prevent release of data involving small numbers or displaying aggregated data only.

Perhaps the most dangerous limitation of GIS technology is the temptation for inexperienced users to draw conclusions about why the maps look like they do; for example, that specific neighborhoods have vastly improved or deteriorated in a particular measure of community health status. The role of public health officials is to reinsert the science, to assert that the visual portrayal of health indicators on a map should raise questions, not necessarily answer them. The maps that local health officials and their partners will create will begin or advance, but not end, the process of community health assessment.

In this way, the development of GIS and other new technologies may change the fundamental role of public health officials. As public health professionals of the twenty-first century, we will work closely with our community partners to ask questions about community health at the neighborhood level. We will serve as resources and facilitators in gathering data, ensuring data quality, interpreting data, and inviting our partners to join us in improving community health. As the technology and information become more available, we will lead the way in promoting assessment, policy development and assurance as community responsibilities rather than government responsibilities.

For more information on public health applications of GIS, please refer to Introduction to Geographic Information Systems in Public Health *by Alan L. Melnick, MD, MPH. Jones and Bartlett Publishers, 1st edition, March 15, 2002. ISBN: 083421878X. The book is available online from the publisher, online at Amazon.com, or at Barnes & Noble booksellers.*

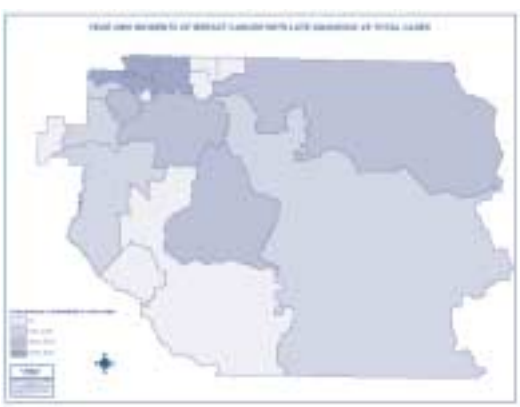


Figure 1. Proportion of breast cancer cases diagnosed late by high school attendance areas, Clackamas County, Oregon, 2000

Turning Point Information Technology Collaborative

By Mark Bertler, CAE, Michigan Association for Local Public Health; and Charles Magruder, MD, MPH, Public Health Practice Program Office, Centers for Disease Control and Prevention

The acts of terrorism that occurred on September 11, 2001 and the lingering threat of bioterrorism since revealed a public health system unable to respond effectively in many instances. After years of neglect, a crumbling infrastructure was apparent. Our public health capabilities were clearly in need of assessment and enhancement.

Fortunately, some visionaries were aware of these problems and created a framework for addressing these serious concerns before the events of 2001. In the spring of 2000, The Robert Wood Johnson Foundation and the W.K. Kellogg Foundation established Turning Point, a national collaborative to develop and establish critical public health initiatives. Five collaboratives-—Information Technology, Leadership, Performance Management, Public Health Statute Modernization, and Social Marketing—were formed "to transform and strengthen the public health system in the United States."

The mission of the Information Technology Collaborative (ITC) is to "assess, evaluate, and recommend to national policy-makers innovative ways to improve the nation's public health infrastructure by utilizing information technology to effectively collect, analyze, and disseminate information." Six states—Kansas, Maine, Missouri, New Hampshire, Oklahoma, and South Carolina—are involved in this process. Oklahoma is the lead state, and one of their representatives, Neil Hann from the Oklahoma State

Department of Health, chairs this collaborative. National organizations are also represented, including NACCHO, the Association of State and Territorial Health Officials (ASTHO) and the Centers for Disease Control and Prevention (CDC).

The collaborative is in the process of completing its first major project, which is the development of a national inventory of software applications utilized by local health departments across the country. Approximately 11 percent of the nation's local health departments filled out the original information technology survey instrument that was used to populate the inventory. This inventory will be dynamic in at least two aspects. First, local health departments who initially entered information in the database, via the survey, will be able to provide updates via an interactive Web site. In addition, local health departments who did not participate in the initial information technology survey will be able to add their information to the inventory using the same Web site. The American Institutes for Research (AIR) will initially host the Web site. The plan is to eventually transfer the Web site to the Public Health Informatics Institute (PHII), online at www.phii.org.

The ITC recently started a second major project: an inventory of state software applications, many of which are used by or impact the operations of local health department activities. Members of the collaborative are currently involved in identifying the key informants in each of the 50 states who will assist in providing information regarding software applications used by the state in the 14 categories identified by the collaborative.

Collaborative representatives presented these activities at the recent APHA Annual Meeting in San Francisco. Slides from that presentation are available from Charley Magruder, a former local public health officer and the NACCHO liaison to the collaborative, at zgu4@cdc.gov. Magruder is now the CDC liaison. The current NACCHO liaison is Mark Bertler, e-mail mbertler@malph.org, from Michigan. Further details and information regarding the information technology collaborative can be obtained from Magruder, Bertler, or Neil Hann at neil@health.state.ok.us.

Partners in Information Access for the Public Health Workforce

With a mission of "helping the public health workforce find and use information effectively to improve and protect the public's health," http://phpartners.org includes information on:

- Health Promotion and Health Education
- Literature and Guidelines
- Health Data Tools and Statistics
- Grants and Funding
- Education and Training
- Legislation
- Conferences and Meetings
- Finding People
- Discussion and E-mail Lists
- Jobs and Careers

Local public health agencies are encouraged to link to http://phpartners.org from their own Web sites, as well as to provide links they believe should be added to the phpartners.org site. NACCHO is a partner in this effort. For more information, visit http://phpartners.org.

Use of Emergency Preparedness and Response Funds to Improve Information Systems

By Carolyn Leep, MPH, Program Manager, National Association of County and City Health Officials

Increased funding for public health emergency preparedness has given local public health agencies an opportunity to enhance their information technology infrastructure. A goal of the Centers for Disease Control and Prevention (CDC) Cooperative Agreements on Public Health Preparedness is to strengthen the communications and information technology systems of local public health agencies, which are critical to timely and effectively emergency response.

The CDC Cooperative Agreement's Focus Area E (Health Alert Network/ Communications and Information Technology) funding is intended to enable state and local public health agencies to establish and maintain a network that will support public health functions that are critical during emergencies.

These functions include:

- Exchanging key information and training over the Internet by linking public health and private partners on a 24/7 basis.
- Providing timely public health advisories to the news media and the public at large.
- Exchanging data between public health partners' computer systems in a rapid and secure manner.

Survey Sites Results

In August 2003, NACCHO surveyed a small non-random sample of local public health agencies (LPHAs) to learn whether and how they have used emergency preparedness funding to enhance their information technology systems. NACCHO, in partnership with the Public Health Informatics Institute, is sponsoring the Public Health Informatics Survey Sites Program.

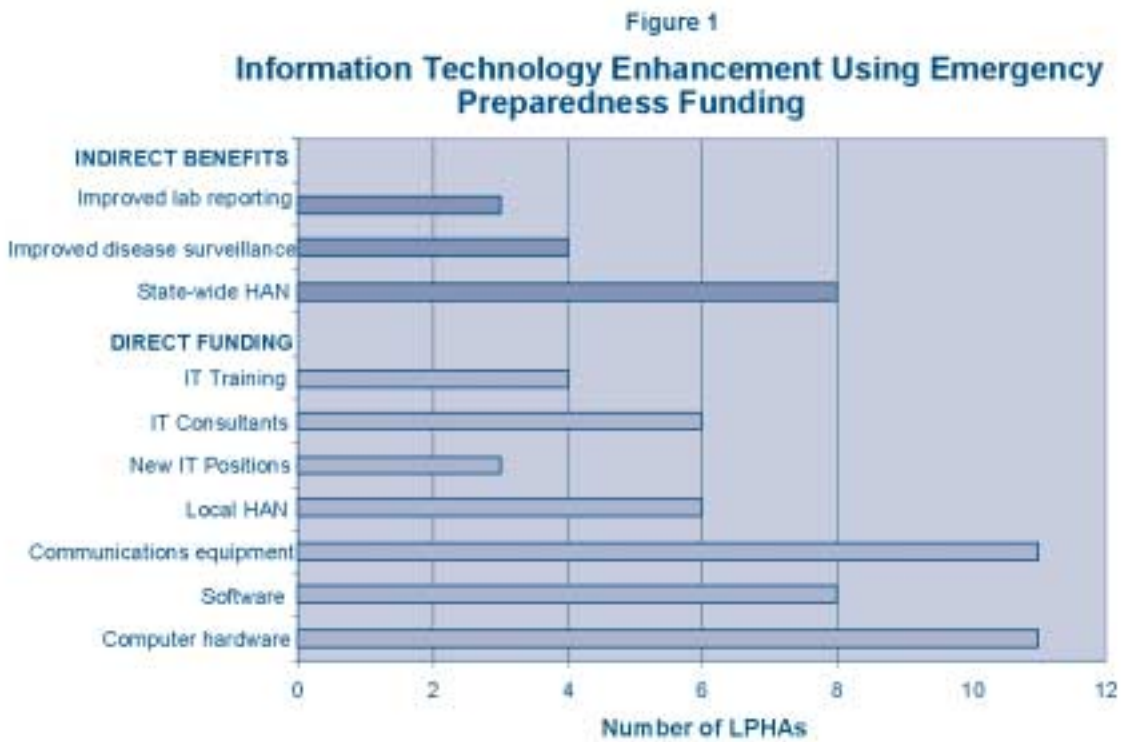
Twenty-three LPHAs have agreed to complete a series of online surveys about their informatics activities. Most survey respondents were chosen for their leadership in the use of information technology. Some were selected via a competitive application process; others are members of NACCHO's Information Technology Committee. The participating LPHAs serve populations of 100,000 to more than a million in locations throughout the country.

Eighteen participants responded to a survey that included questions about how LPHAs have used direct funding from their states under cooperative agreements on emergency preparedness from CDC and the Health Resources and Services Administration (HRSA). Eleven LPHAs reported that they had used direct funding to enhance their information systems. Figure 1 summarizes information about how these LPHAs used these funds.

All 11 LPHAs that received direct funding purchased new computer hardware and communications equipment. Laptop and desktop personal computers (PCs) and servers for various applications comprised most of the purchases. Many purchased new computer software, either as an upgrade to the agency's core information technology (IT) systems or applications related to disease surveillance. Approximately half developed a local health alert network (HAN) to provide information to hospitals, emergency responders, and other public health partners. Three LPHAs funded new IT positions, and six hired contractors or consultants to assist with specific IT projects. Four provided IT–related training to some of their staff.

The survey sites were also asked whether their information systems had benefited indirectly via the CDC and HRSA emergency preparedness grants. Eight of 18 responding LPHAs reported that their information systems had benefited, and five more expected them to benefit in the future. Five LPHA information systems had not benefited indirectly and did not expect to in the future. All eight LPHAs who had benefited indi-

Figure 1



rectly were served by a HAN, and half reported improved statewide disease surveillance systems. Three agencies reported improved laboratory reporting systems, and one received additional IT technical assistance from the state.

These findings agree with the results of NACCHO's survey of Sentinel Health Departments on assessing local participation in state preparedness planning (http://archive.naccho.org/Documents/Research–Brief–Oct–03.pdf). Both surveys suggest that LPHAs in some states are benefiting from emergency preparedness grants, while others are not benefiting. Five of the 18 informatics survey sites indicated that they had not yet received direct funding or gained indirect benefits that improved their information systems, and two of the five do not expect to benefit in the future. In an August 2003 BT Sentinel Sites Survey, 21 of 46 respondents reported improved information systems and 24 reported improved communications systems as indirect benefits from their state's expenditures for emergency preparedness.

Experience from the Local Perspective

Minnesota's approach to the distribution of its CDC public health preparedness grant involved convening a work group comprising representatives of state and local public health organizations to recommend the funding formula for the grant. Seventy percent of the first year's funds were allocated to the Minnesota Department of Health and 30 percent to local public health agencies. In the second year of funding, the distribution was 50/50.

Lila Taft, Public Health Planning Coordinator for Dakota County (MN) Public Health Department, reports that her agency identified three areas for use of these emergency preparedness dollars: streaming media, video conferencing, and a wireless device health alert technology program. These resources help the public health department satisfy requirements for emergency preparedness and improve IT resources for the department and for the county in general.

The streaming media initiative provides a method to access live or recorded audio/video files either individually or in large groups. One objective was to capture live training satellite broadcasts from various external organizations and convert the captured video into a web cast accessible anywhere on the county's network on demand. Video conferencing technology allows the county to connect its three service centers with the state health department and other partner agencies. The public health department and the county can now use this technology to broadcast meetings, training, and other events across the county, the metropolitan region and the state.

The wireless device alert program will be used to meet the Minnesota Department of Health's requirement that county public health agencies develop an information dissemination system and emergency preparedness plan that provides around-the-clock response coverage. This system ensures rapid dissemination of public health alerts, enables electronic data exchange, ensures protection of data, and provides adequate backup capabilities. Dakota County Public Health, Information Technology, and Community Services Administration staff worked together to develop these technology criteria, evaluate potential vendors, and conduct a pilot. Pilot findings provided information and direction for Dakota County to establish a wireless device health alert standard. These standards, developed by Dakota County, can be adopted by other jurisdictions that wish to establish a similar program.

Larry Schaad, Chief, Health Systems Development, reports two IT investments that El Paso County (CO) Department of Health and Environment (EPCDHE) made using emergency preparedness funds. EPCDHE enhanced their communication capability by purchasing Blackberry wireless e-mail systems for their senior executives and emergency response leadership. "Whether we are in meetings or at home or on the road, we can be in direct e-mail contact with our department senior leadership as well as our partners."

EPCDHE brought satellite downlink capability to the department's auditorium and small conference center. This upgrade was done in cooperation with the County Facilities Department, which split the costs for the system. "We now are able to not only have our staff view bioterrorism and communicable disease satellite downlink broadcasts, we have the room to invite our community and regional partners—something that was extremely helpful during last spring's smallpox vaccination broadcasts."

Conclusions

Focus Area E includes four critical capacities and two enhanced capacities.

These capacities address:

- Communications connectivity among public health partners.
- Emergency communication for public health emergency response.
- Protection of critical data and information systems.
- Electronic exchange of clinical, lab, and other public health data.
- Emergency response management systems.
- Full information technology and support services.

NACCHO's limited survey data suggest that many LPHAs are addressing some of these capacities, while few to date are addressing other capacities. Nearly all of the respondents who had received direct funding have used it to help ensure adequate IT resources and to improve their emergency communications systems. Many have improved communications connectivity among the public health partners in their communities, and some have upgraded the security of their information systems and participated in emergency response management systems. Very few have used this funding to enhance electronic exchange of information with labs, clinical sites, or other public health agencies.

Differences in progress for various capacities might have resulted because:

1. Some of these capacities can be addressed more easily in a short time frame. Computer hardware and software and communications devices for the LPHA can be obtained in a short time frame. Improving computer security, establishing connectivity with other organizations, and developing systems for electronic data exchange are all longer–term efforts that often require collaboration with other organizations.
2. Weaknesses in some of these capacities may be perceived as a clearer threat to emergency preparedness than others. Lack of 24/7 communications capability or an effective communications network with other public health partners may be higher priorities than developing systems that permit automated exchange of electronic data.
3. Electronic exchange of data is a highly complex function that must include standards for various classes of terminology (e.g., clinical, laboratory, public health), message exchange, and other aspects of electronic communication. Stakeholders have not reached consensus on all of these standards, and guidelines for how to implement the standards need to be developed. Consequently, electronic exchange of data is a long–term effort that will require collaboration by many.

Participants in the Informatics Survey Sites Program met in September 2003 to identify major challenges in public health informatics at the local level and discuss possible solutions. A number of participants mentioned the challenge of expending emergency preparedness funds administered by the state on a very short timetable. They felt that the short timetable made it difficult to make wise IT investments. This suggests that state and local health agencies need to improve the process for allocating grant funds. It also suggests that LPHAs would benefit from developing a strategic plan for IT investment that reflects their agency's goals and priorities. A recent survey indicated that only eight of 22 LPHAs currently had an IT strategic plan. Developing such a plan requires considerable time and resources, but would allow LPHAs to more quickly focus available funds on high-priority projects.

For more information on the Survey Sites Program, contact Carolyn J. Leep, MPH, Program Manager, NACCHO, at (202) 783–5550, Ext. 253, e-mail cleep@naccho.org.

The author thanks the following individuals for their editorial assistance: Zarnaaz Bashir, MPH; Carol Brown, MPH; Donna Brown, JD, MPH; and Abigail Long, MPH.

Knowledge Management: Primer for Public Health

NATIONAL ASSOCIATION OF COUNTY & CITY HEALTH OFFICIALS

By Seth Foldy, MD, Milwaukee Health Department and Medical College of Wisconsin (Chair, NACCHO IT Committee)

Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information? T.S. Eliot
Where is the information we have lost in data? Harlan Cleveland

Among the more enduring business concepts to emerge from the 1990s is the "learning organization." Organizational agility and productivity are highly dependent on constant learning at all levels of an organization. But how does an organization keep from losing its memory? And how does knowledge reach those who need it, when and where they need it?

These are the questions at the core of organizational knowledge management. It begins with the concept that knowledge is as much an asset as financial capital. Unlike money, knowledge is constantly minted inside an organization through research, discovery and experience. Unlike money, when knowledge is shared you end up with more than you had before. The most successful organizations will manage and maximize this asset.

Getting our hands on useful knowledge in a hurry often takes extraordinary measures. For example, consider Kristine Gebbie's description of how many health departments manage a public health emergency: "They look for the oldest living public health nurse and the oldest living environmental hygienist and ask them what they did in the old days." Imagine if such knowledge were already shared across the organization through training, protocols and decision support tools.

Information is not Knowledge

Public health workers are drowning in information. Information becomes useful knowledge when:

1. The information is evaluated. (Is it accurate? Evidence-based? Relevant to my situation?)
2. It is selected because it meets a need.
3. It is structured and organized for retrieval.
4. In the ideal, it is routinely delivered when and where decisions are made (decision-support).

While information just accumulates, knowledge *evolves* by selection and accessibility. Take, for example, this article. Many busy NACCHO members put the *Exchange* on a "to be read" stack and then recycle it before reading. Those who read this article and find it relevant and useful may share it and/or file it for later retrieval. Like much of the information produced in public health, it is "grey literature," published outside a peer-reviewed or commercial publication, thus less accessible through mainstream data retrieval services like PubMed.org. Now that *Exchange* is available on the Web, a Web-crawler like Google.com might—or might not—find this article for someone searching for "public health knowledge management." This article may or may not join your knowledge base by this rather chaotic "natural selection" process. So ask yourself: how can our organizations transform more of the information littering our desks, files and brains into knowledge available to those who need to know it, when and where they need to know it?

Explicit Knowledge, Tacit Knowledge, and Competence

Newsletter articles, database tables, and oral presentations are examples of *explicit* knowledge, knowledge already organized into written or spoken form. *Tacit* knowledge is the insight people learn (earn) through experience or practice. It represents the ways people integrate explicit knowledge and put it to use. A book on outbreak investigation is explicit knowledge; the way an experienced public health nurse organizes his or her desk to get an investigation halfway completed before the end of the first phone call—that is tacit knowledge at its finest! Tacit knowledge is one of the richest assets of an organization, one reason why staff turnover is so expensive. Once the value of such knowledge is understood, organizations seek ways to distribute and preserve it. This ranges from hands-on training (a new nurse applying book-learning under supervision) to creating social networks within the organization, or, as we have tried recently, to get all that knowledge of "how things are *really* done" into an electronic licensing and inspection management system.

Tacit knowledge transforms explicit knowledge (book-learning) into competence. Core Competencies for Public Health Professionals (www.trainingfinder.org/competencies), because they focus on performance, not just formal studies, are a good way to structure a knowledge management system that includes tacit knowledge.

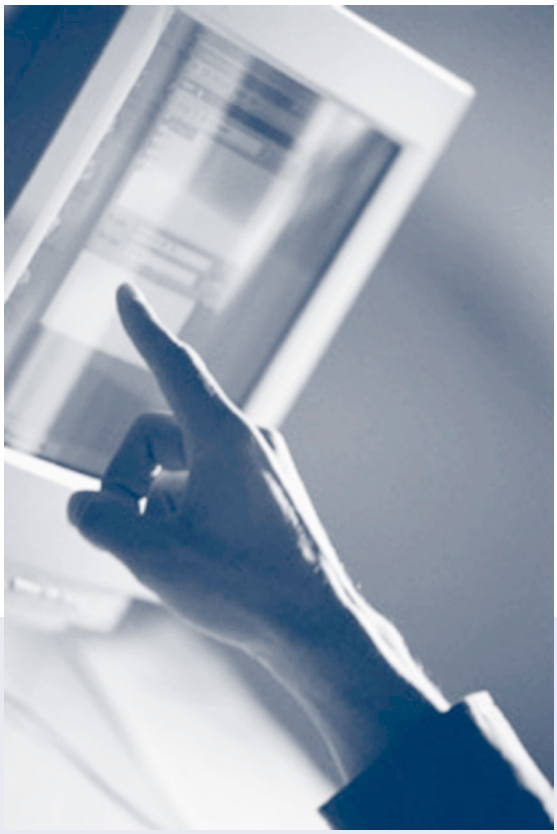
Because so many organizations have failed in the past to value tacit knowledge appropriately, owners of tacit knowledge often learn to use it to obtain informal, as opposed to formal, power in the organization. This helps explain why they may not share your enthusiasm for suddenly distributing that knowledge (power) to others! Turf battles that defy formal organizational change are sometimes rooted such struggles. Valuing tacit knowledge must begin with valuing those who have it.

Knowledge Management and Technology

Technology does not automatically transform information into organizational knowledge. Indeed, a poorly designed information management system can violate the "tacit" codes of practice in your organization and transform an efficiently-working office into a disaster. (Incorporating tacit knowledge into your electronic information system is an important part of assessing the system "business requirements" and should be taken very seriously.)

What information technology can do is:

1. Aid the acquisition, storage and retrieval of information (databases, data-mining, information networks)
2. Aid the analysis and display of information, improving its utility (spreadsheets, statistical software, graphics programs, geographic information systems, presentations)
3. Aid knowledge access, transmission and collaboration (directories, email, intra- and internet, document management, conferencing)



Improving Access to Extrinsic Knowledge

Drowning in information, our challenge is finding the *right* information when we need it. Often we seek information from outside our organizations. Internet access is critical for public health professionals because so much of our work appears as grey literature, which is increasingly accessible thanks to electronic publishing, the internet, and increasingly sophisticated Web-crawlers. The problem is sorting the resulting information by both relevance and accuracy. Good news here is that Centers for Disease Control and Prevention (CDC), a highly reliable and relevant source, will soon replace its notoriously balkanized Web site with a site designed by knowledge management principles, allowing fast access to information regardless of the center or institute that produced it. The New York Academy of Medicine is helping us by cataloging and sharing public health grey literature publications at (www.nyam.org/library/greylit).

Restricting our search to peer-reviewed literature helps assure more rigorous evaluation. Getting someone else to plow through the literature for us makes a lot of sense—physicians benefit from wonderful evidence-based newsletters like *Journal Watch* or electronic digests like *Up-to-Date*. Unfortunately the smaller public health market has generated only partially-developed pilot projects. The *Healthy People 2010* Information Access Project (http://phpartners.org/hp) runs preset PubMed searches for you based on public health topics, (but typing your own search into PubMed.org is pretty self-explanatory anyway—try it, you'll like it). More useful still are structured reviews (usually of peer reviewed papers). The sparsely-populated *Guide to Community Preventive Services* (www.thecommunityguide.org) is one attempt to fill this niche. The international Cochrane collaboration (www.Cochrane.org) actually has many more evidence-based reviews of public health interest. As a physician I often use the Agency for Healthcare Research and Quality's National Guideline Clearinghouse (www.guidelines.gov) where you could see for yourself what public health could have if we: 1.) published enough rigorous evaluations of our practices where people could find them; 2.) recruited professionals to review the literature and produce evidence-based guidelines; and 3.) generated sufficient demand for such a site. Although less rigorously evaluated than structured reviews of the peer-reviewed literature, peer-judged model practice databases like the NACCHO Model Practice Web site, (www.naccho.org—must perform topic search for Model Practices); the

DHHS Best Practice Initiative (www.osophs.dhhs.gov/ophs/BestPractice); and the National Governors Association Center for Best Practices (www.nga.org/center) are other sources of selected, accessible knowledge. Looking up "public health best (or model) practices" on a Web-crawler like Google.com produces lots of useful results.

Making our own organizations' explicit knowledge available to our own staff and to the public can be aided by 20th as well as 21st century techniques. Managing our internal explicit knowledge begins with a well-organized document management system. Making useful information available to the public today goes beyond pamphlets and annual reports. Our challenge is to move the information we produce out of file cabinets and shelves and onto intra- and internets, where more people can find it and use it more quickly. (Pass the checkbook, please.) Of course, placing critical information where decisions are made (like a big whopping warning on every cigarette pack) is the ideal.

Improving Access to Tacit Knowledge

There is little wrong with the traditional ways of sharing tacit knowledge—mentorship, staff-orientation, peer consultation, conferences… except that time is short and so is the travel budget. CDC's Epi-X, a secure posting and discussion site for outbreak epidemiology offers one model of collaborating with experienced peers from your desktop. (It is likely that Epi-X will soon be made available to local health officers.) Audio and video conferencing, and collaboration Web-tools (offering stringed discussions, bulletin boards and other instruments of sharing) are other tools that help us share experience in addition to facts. Many corporations and associations try to develop communities of practice where far-flung individuals with similar issues can exchange insight, lubricated with a little food and drink (local) or a collaboration Web site (global). It may be useful to imagine the concept of "social network" as a tacit knowledge incubator, whether the topic is caring for babies (in the community) or getting Epi-Info to work (in the workplace).

Knowledge Management for the Public Health System

Public health is different. Unlike corporations that mine knowledge toward a competitive advantage, we are intent on sharing it with other public health system partners. We are (or should be) masters at collecting information from across the public health system and transforming it into valuable knowledge. (This is a "knowledge management" definition of surveillance. For example, we transform a detected rise in pertussis cases into an useful alert for healthcare providers.) Until we become skilled at managing knowledge inside our own organizations we may not be well prepared for the larger challenge of community-wide knowledge management. Nevertheless, in Milwaukee we can point to simple examples like:

- A secure Web site that emergency departments use to send information to our department and we use for alerts and mounting useful reference materials.
- A community health improvement partnership Web site where all partners can display their events on a common calendar.
- Creating "dashboards" that display multiple data trends on a single graphic for rapid comparison and comprehension of trends (like weekly pneumonia and influenza mortality, influenza-like illness, and influenza culture results which previously were produced and distributed separately by different parts of our department).
- Converting CDC's complex SARS case surveillance and isolation advice into a one-page screening form for healthcare providers, and adding a 24-hour phone number to receive expert "tacit knowledge" from a skilled public health professional.

"Until we become skilled at managing knowledge inside our own organizations, we may not be well prepared for the larger challenge of community-wide knowledge management."

You will notice again the pattern of evaluating information, selecting what information is needed, and making it highly accessible when and where it is needed. Creativity and loyalty to these goals makes our department the go-to source of knowledge for our public health system partners. It also increases their willingness to share knowledge with us.

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Acknowlegements: Roger Luckmann MD, MPH and NACCHO Information Technology Committee members and staff provided critical insight for this article.

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March 21 for regular review

April 15 for late-breaker review (very limited space)

All sessions must pertain to the Public Health Information Network and abstracts must include a description of how the proposed session relates to PHIN.

Questions?

E-mail phin2004@cdc.gov.

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ASSOCIATION OF
COUNTY & CITY
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NACCHO, 1100 17th Street, NW, 2nd Floor
Washington, DC 20036
Phone: (202) 783-5550
Fax: (202) 783-1583
www.naccho.org