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Promoting Effective Local Public Health Practice

Informatics Works in Local Health Departments

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Mid-Michigan District Health Department is a small, rural local health department (LHD) in which public health informatics is *really* working. Every day, the public health nurses in this LHD manage client care with an electronic health record (EHR); the LHD is a regional administrator for the state's immunization registry and uses data from the registry to drive immunization campaigns; the disease control staff seamlessly interact with other local and state personnel to manage outbreaks using the state's disease surveillance system; and the time-share epidemiologist generates reports from the syndromic surveillance system to show trends at area emergency departments. These systems are far from perfect, but they are good and are getting better fast. More important, they are changing the way the LHD operates, making it more efficient and opening up new options for providing and sustaining services.

Public health informatics refers to the electronic exchange of data to support public health operations, so informatics in public health is about more than information technology (IT). For example, a new patient management system is an IT project, but the system is also informatics if it involves getting electronic referrals, sending electronic bills to Medicaid, or exchanging data in any of a myriad possible ways.

Data from the National Association of County and City Health Officials show that more and more LHDs are effectively participating in health information exchange (HIE). The *2010 National Profile of Local Health Departments* showed that a fifth of LHDs had EHRs, 56 percent participated in electronic syndromic surveillance, and three-quarters were connected to an immunization registry—and these percentages have likely increased since 2010. With LHDs becoming more involved in informatics, they should consider the following key ingredients for success:



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- **Local Leadership at the State Level**—Except for the largest urban areas, LHDs depend at least in part on statewide or territorial systems. Most LHDs will not have access to good immunization registries, laboratory information systems, or surveillance systems unless states or territories build them. If an LHD has an EHR, and wants to exchange EHR data with other providers, it will need to be part of a regional HIE. In most places, the states or territories have created the federally funded state plans to support HIEs. That does not mean LHDs should be at the mercy of states. On the contrary, statewide systems will not meet local needs without local leadership. If a state has great public health informatics, LHDs need to be involved to take best advantage of it. If the state does not yet have a strong informatics system, LHDs need to work with policymakers toward change. LHDs should find out how the state's HIE plan is governed and get involved.
- **Strategic Prioritization**—An LHD's strategic plan explains its main goals. A good strategic plan explains how the LHD will shift money and staff time to achieve those goals. Informatics is connected to strategic planning in two ways. First, for informatics projects to be successful, sufficient resources need to be allocated to them. However, because of financial constraints, LHDs are often guilty of under-resourcing informatics. For example, an LHD might buy an EHR but not enough network bandwidth, so the system runs too slowly, frustrating staff and clients and reducing productivity. LHDs may have access to data—surveillance data, data on client outcomes, etc.—but they do not assign anyone to analyze the data, so they are never able to use data to improve work.

For informatics projects to be successful, sufficient resources need to be allocated to them.


Second, informatics is connected to strategic planning because it drives the LHD's ability to measure plan outcomes. Once counting units of service was considered innovative: How many shots did the LHD give? How many well permits did it issue? Today, strategic plans are tied to improved outcomes: Family planning clients avoid second pregnancies; diabetics control their illness; children who may have hearing problems receive effective treatment, etc. Strategic plans often include productivity goals such as increased clinic up-times or less time spent on paperwork. Informatics underpins the ability to capture, manipulate, and analyze data on such outcomes quickly and cost effectively.

- **The Right Workforce**—Mid-Michigan District Health Department had decided to use so-called "meaningful use" incentive payments under the Health Information Technology for Economic and Clinical Health (HITECH) Act to offset the costs of obtaining an EHR. To make this work, the LHD had to involve the right people. A physician-supervised nurse practitioner qualified for the incentive payments by using the EHR; a good programmer pulled from the EHR the data required by Medicaid to earn the payments. Yes, these skilled people cost money, but the entire LHD benefitted from that investment by having access to data that boosted productivity and efficiency. As technology in LHDs changes, staffing models have to change with it.

- **Careful Selection of Systems**—Many healthcare providers, not just public health, struggle with complex, expensive technology that might seem to complicate processes. LHDs with tenuous finances cannot afford to make technology blunders. LHDs often do best with systems made for public health, especially if the systems are already in use in neighboring LHDs. By selecting such systems, LHDs can form user groups that have clout with vendors, enabling them to demand technical assistance, timely upgrades, and price concessions.

Informatics is essential for future success. The way public health services are paid for is continuing to change. If LHDs do not adapt, these changes may reduce their ability to deliver services, but if they can adapt, they may even thrive.

With only a few exceptions, categorical programs are shrinking and even disappearing from some LHDs. States are curtailing dedicated funding for certain public health services and instead asking LHDs to earn the dollars to support their programs from Medicaid health plans. While categorical programs have been the rule, LHDs have not had to figure out how to deliver services or what to report. States have told them what to do.

As LHDs begin to negotiate business relationships with other providers in the community to earn their way, they will have to develop their own business models. Business partners will demand to know whether LHD services are effective and how they will impact businesses' finances; LHDs will need to figure out how to use data to prove their value and make the case for expanded offerings. Public health informatics will be the pillar of these new business models and will ensure that public health remains relevant and capable in a new era. 

Chicago Health Atlas: Engaging in Public Health Surveillance beyond the Confines of the Local Health Department

By Roderick C. Jones, MPH, Chicago Department of Public Health; Bechara N. Choucair, MD, Chicago Department of Public Health; Daniel X. O'Neil, Chicago Community Trust, SmartChicago Collaborative; Abel N. Kho, MD, MS, Northwestern University and Chicago Health Information Technology Regional Extension Center; on behalf of the Research Team*



The third largest city in the United States, Chicago has 2.7 million residents and covers about 229 square miles. Within the city limits, the population is diverse in terms of both race-ethnicity, with Latinos, non-Latino blacks, and non-Latino whites each making up about one-third of the population, and socioeconomic indicators, with wide variation in the level of neighborhood poverty, education, and unemployment. The experience of health and illness in Chicago reflects these distinct social, demographic, and geographic realities, and “the neighborhood effect” is ever-present in the discussion of health disparities and the formulation of interventions to diminish them.¹

As an extension of the public health surveillance function of the local health department, the Chicago Health Atlas is a collaboration among local medical informatics researchers, the Chicago Health Information Technology Regional Extension Center (CHITREC), the Chicago Community Trust, and the Chicago Department of Public Health (CDPH). The initiative uses information technology to combine and deliver data related to community characteristics, public health statistics, medical care indicators, and health intervention strategies so that policymakers, healthcare practitioners, advocates, and the public may participate in monitoring health status and mitigating community health problems.

Healthy Chicago is the first comprehensive plan for public health put forth by the City of Chicago.² Mayor Rahm Emanuel originally called for the formation of a public health agenda in his 2011 transition report, and *Healthy Chicago* is now a blueprint for a focused approach by CDPH to implement policies and system changes to transform the health of the city over a five-year period. As part of *Healthy Chicago*, CDPH established the Epidemiology and Public Health Informatics Program. Beyond the traditional epidemiology function of generating knowledge about health and illness events, behaviors, determinants, and disparities in Chicago, the program facilitates and promotes the use of health information technology and electronic data exchange. Through the program, CDPH has increased the availability of public health data through the City of Chicago Data Portal, where more than a dozen datasets covering a decade's worth of community-level public health statistics and public health-associated census data aggregations are published and routinely updated.³

For several of *Healthy Chicago's* 12 priority areas, Chicago's existing public health surveillance systems provide a level of detail that is suboptimal for monitoring progress on health improvements. To address these gaps, CDPH has embarked on a plan to conduct a telephone health survey of city

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For public health stakeholders, including CDPH, these data provide a better means of quantifying the burden of chronic diseases, such as obesity, asthma, or diabetes, at the neighborhood level than what currently exists in Chicago.

residents and has pursued new secondary analyses of data from existing datasets (e.g., school physical exams, hospital discharge dataset, cancer registry). A third approach is to use data from the electronic health records (EHRs) of patients seen at local healthcare facilities.

Operationally, the Chicago Health Atlas consists of two parallel efforts: (1) creating a website for data visualization (www.chicagohealthatlas.org); and (2) generating meaningful population health estimates for the Atlas through analyses of EHR data from multiple institutions. The creation of the website has involved the following:

- Identifying health-related data from potential partners across the city and evaluating the need for data-sharing agreements;
- From these partners, securing and importing point data (e.g., locations of services or health-related events and infrastructure) and polygon data (e.g., counts, rates, or percents pertaining to a geographic area); and
- Developing procedures and best practices for ongoing integration and visualization of spatial datasets.

A website is now live and under construction.⁴ The first datasets included were the public health indicators for the most recent surveillance year available, which were posted on the City of Chicago Data Portal. With these initial layers loaded, the project partners have discussed how best to make metadata—including data sources, definitions, formulas, disclaimers, and limitations—easily accessible to site users and how to incorporate the Centers for Disease Control and Prevention's guidelines for classifying categories in maps.^{5,6}

The work with pooled EHR data builds on an existing partnership between informatics researchers, under the CHITREC umbrella, at academic hospitals in Chicago (the "Research Team"). As part of a prior pilot project, the Research Team demonstrated the technical and organizational ability to link patients across the multiple institutions, while still maintaining patient anonymity, by using a one-way hash algorithm.⁷ The most recent Atlas work has involved the following:

- Securing Institutional Review Board approvals at participating institutions;
- Finalizing requirements for standardized data extraction across sites and collecting into a single database the de-identified EHR data from the institutions;
- Describing match rates (i.e., patients who receive healthcare at multiple institutions) and testing de-identification against federal "Safe Harbor" statutes;⁸ and
- Developing statistical methods to convert patient-based rates to geographically based disease prevalence estimates.

The Research Team designed a Java application to perform a standard set of pre-processing and data standardization steps on demographic data. The application

subsequently used the Secure Hash Algorithm (SHA)-512 hashing algorithm to create five unique hash IDs for each unique patient using different combinations of available demographic data. As of December 2012, data on demographics, vital signs, diagnoses, medications, and laboratory tests from the institutions' emergency department and inpatient and outpatient sites had been de-identified and incorporated into the database. For the Chicago Health Atlas analyses, there are 1.8 million patients born between 1923 and 1984 with residence in one of Chicago's U.S. Postal ZIP codes (i.e., first three digits 606). Initial analyses found that approximately six percent of patients had sought care over the five-year period 2006–2010 at more than one of the institutions.⁹


The resulting database now has the potential to answer at least three kinds of questions. For participating institutions, analyses can be done to address federal "meaningful use" regulations related to interventions that are oriented to computerized prescriptions and active medications; laboratory results that indicate whether diabetes is well-controlled; active diagnoses; racial and ethnic disparities in condition and in treatment; and vital signs such as BMI, blood pressure, and smoking status.¹⁰ For medical researchers, the database provides a set of records that is more diverse and rich than a set that pertains

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to any single institution's patients; this can facilitate cross-institutional collaboration on issues of public health importance. And for public health stakeholders, including CDPH, these data provide a better means of quantifying the burden of chronic diseases, such as obesity, asthma, or diabetes, at the neighborhood level than what currently exists in Chicago.

Currently, type 2 diabetes is being used as a test condition for prevalence estimation. Various definitions of having the condition are being devised, taking into account the various locations within an EHR where pertinent—or contradictory data—might reside (e.g., diagnoses, medications, laboratory results). The intent is to develop valid, reproducible algorithms for identifying a case, or numerator in the prevalence calculation.¹¹ Similar work will be undertaken with respect to denominators, so that the estimates reflect the burden of disease at the neighborhood level as accurately as possible. Once estimates are available, comparisons to other sources of small-area estimates, such as neighborhood surveys or statistical modeling of Behavioral Risk Factor Surveillance System data, will be used to evaluate the estimates derived from the Chicago Health Atlas database, and the layers will be incorporated into the visualization tool. 

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Local Health Department Participation in Health Information Exchange

By Claudia Blackburn, MPH, RNC, Health Director, Sedgwick County Health Department

LHD involvement in HIE involves developing relationships; defining agendas with shared needs, goals, and activities; and what is often most important—building trust.

Entering the world of health information technology (HIT) and health information exchange (HIE) may be challenging for many local health departments (LHDs) because staff do not have formal backgrounds in IT and possess varying levels of knowledge and skills. In addition, many LHDs, particularly small ones, have limited funds to invest in technology and rely on state-based IT programs and systems designed for specific programs, such as Women, Infants, and Children, disease reporting and investigation, and immunizations. Further, connecting to the HIE may not be a top priority for many LHDs, so effective leadership is needed to encourage participation in HIE at state, local, and regional levels.

A couple of years ago, the health director of Sedgwick County (KS) Health Department had the opportunity to serve on the local Wichita Health Information Exchange Board and the Kansas Electronic Health Advisory Council at the state level. Those opportunities, combined with a grant from the Kansas Health Foundation to review how the state immunization registry would work with HIE, thrust Sedgwick County into the unknown world of HIE and HIT. The following recommendations are drawn from lessons learned during that process.

What should LHDs do to advance HIT within their departments and in coordination with healthcare partners?

LHDs should first assess their current reality. List all of the technology systems in use and briefly describe what they do and how they interact. When Sedgwick County Health Department completed this process, the LHD found that a dozen programs did not “talk” to each other, and the practice management system had limited capabilities. After assessing the current system, next decide whether or not the LHD needs an electronic health record (EHR) and whether the LHD needs to link to the HIE. If so, consider what the EHR and linkage would look like and what resources exist to help. For example, in Kansas, the State Association of County and City Health Officials (SACCHO) is developing an assessment tool and algorithm to assist LHDs with decision-making.

Where and how can LHDs get more involved and demonstrate leadership?

Check with state health departments or look online for information about the state HIE board. Find out who the HIT coordinator is for the state and learn about the state health department’s plan and progress. State epidemiologists are often involved because of the need to work with health providers to demonstrate “meaningful use” through sharing of immunization information with a registry and receiving electronic laboratory reports and syndromic surveillance information.

Find out which regional extension center (REC) serves the jurisdiction. RECs were funded through the Office of the National Coordinator for Health Information Technology to help more than 100,000 primary care providers adopt and use EHRs in the United States. RECs primarily focus on individual practices, small-provider practices, hospitals, and clinics that serve the uninsured and underinsured, but they can also be a resource for LHDs, although there may be a fee associated.

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Check with SACCHOs regarding any existing HIE committees or workgroups. If no such activity is occurring, suggest that the SACCHO consider getting involved. In Kansas, a SACCHO member represents LHDs on the state HIE board.

Check with local and state medical societies and hospital associations to identify who is leading HIE-related issues. Ask to participate on some level, perhaps through a committee or by representing LHDs on a board.

Look to the county's public health board for opportunities to engage. Many have representatives from hospitals and healthcare organizations that are participating on the state HIE board or are involved in transitioning to EHRs within their organizations.

Once an LHD is participating, what should the LHD articulate?

LHD involvement in HIE involves developing relationships; defining agendas with shared needs, goals, and activities; and what is often most important—building trust. LHDs can share updates on public health developments at the state and local levels or share ideas for public health uses of the data, especially from the local perspective. They can pose provocative questions and use case scenarios that steer the creation and development of the HIE. LHDs must be assertive, make their needs known, and make clear what value they offer to partners. LHDs should be prepared to address questions such as the following: What are public health data needs? From a data perspective, what would help elevate the health of the community? Who are the best partners in the new healthcare delivery paradigm?

What should LHDs do now?

LHDs should consider whether connecting to the HIE is part of its strategic plan. All LHDs are responsible for monitoring communicable diseases and protecting the community from health threats. At the very least, exchanging data with community health partners about clients with reportable diseases is a reason to participate in the system.

Linking to HIE can mean access to secure messaging systems (e.g., DIRECT), which allows exchange of patient information via a secure e-mail system and replaces cumbersome faxing. Better yet, the HIE may have a provider portal that allows LHDs to look into the EHR without having to contact the provider. For example, in a communicable disease investigation, epidemiologists could access hospital records of clients with reportable diseases through the HIE's provider portal.

Has the LHD figured out what is needed from the HIE and how to get it?

In Kansas, an HIE Committee formed through the Kansas Association of Local Health Departments has focused on education and awareness of new developments in the state until recently. Currently, the committee is working with a small group of LHDs to test a tool and process for determining whether LHDs need an EHR, a link to the HIE, or both. Byproducts of this process may also lead to improvements in current IT systems within departments, especially in an environment where many LHDs use the same systems.


What should LHDs plan for?

When planning for future involvement in the HIE, LHDs need to consider questions such as the following: What are the community health priorities and concerns? Can data inform progress on the community health improvement plan? What interests providers? LHDs should consider starting with what is most important to providers

and other partners as a way to add value to the health system. The possibilities seem endless, so seeking data for a purpose is important. LHDs must ask clear questions and try to ensure that the answers will lead to action. They must consider whether staff can manage, analyze, and report on data. In addition, LHDs should consider how they will interact with BioSense.¹ LHDs should work with state health departments to understand their progress on implementing BioSense and how LHDs can participate.

With respect to what should be done at the local versus state level, in the case of a very small LHD, it may make more sense for the state health department to link to the HIE and for the LHD to receive information from the state. Laws governing reporting of communicable diseases, volume of data, and LHD capacity are decision-making drivers when answering this question. However, where there are state solutions, LHDs must be involved—ensuring that they have adequate and timely access to data and that their needs are met.

How can LHDs measure their progress?

LHDs can conduct completeness of reporting and timeliness studies to determine whether exchanging information through the HIE is improving their efficiency. Automatic reporting and alerts may contribute to improved disease reporting. For example, HIE makes it possible for LHDs to monitor community indicators such as the average HgA1c level of diabetics in the community or the percentage of tobacco users who receive appropriate intervention. In addition, monitoring behavioral changes in residents who are part of the HIE can help LHDs understand if they are progressing on a number of population health indicators and can give providers a community standard to which they can compare themselves. 

Notes

For more information about BioSense, see article on p. 8.

BioSense 2.0: A New Model for Improving Quality, Decreasing Costs, and Increasing Collaboration

By Joe Gibson, MPH, PhD, Director of Epidemiology, Marion County Public Health Department, and Chair, BioSense Governance Group

State and local health departments vary in the software and hardware they use for surveillance, so transplanting surveillance software or an analytic program from one health department to another can be difficult. The BioSense 2.0 platform, sponsored by the Centers for Disease Control and Prevention (CDC) and administered by the Association of State and Territorial Health Officials (ASTHO), has potential to greatly facilitate sharing of surveillance tools among health departments and to facilitate collaborative development of new tools. BioSense may also greatly decrease the cost to health departments of creating and maintaining surveillance systems.

BioSense is a cloud-based¹ computing environment for syndromic surveillance that contains information on emergency department visits and hospitalizations in hospitals in participating state and local jurisdictions, as well as Department of Veterans Affairs and Department of Defense hospitals. It contains private, secure storage areas for each participating health department, plus shared software applications.² BioSense allows health departments to mimic their current syndromic surveillance operations on this shared platform, creating new opportunities for sharing tools and appropriately de-identified data to create a more integrated, national surveillance system. It is also a

The BioSense 2.0 platform has potential to greatly facilitate sharing of surveillance tools among health departments and to facilitate collaborative development of new tools.

“catcher’s mitt” through which health departments can receive syndromic surveillance data from healthcare providers with “meaningful use” certified electronic health records. The shared environment minimizes the system costs for each participant; the system and support costs are paid through CDC funding at a price far lower than the price for most CDC surveillance systems.

Partnership and collaboration are integral to this new model for a public health information system. While the system is funded by the CDC, ASTHO holds the contract for the environment, which is governed by representatives of local, state, and federal agencies.³ ASTHO is an agent for each participating jurisdiction, preserving each jurisdiction’s direct authority over its data. This structure makes each participant a partner on the platform, rather than the CDC being the controlling authority. The joint governing of the platform helps cultivate collaborations and sharing of tools and data.


As of mid-November 2012, seven local health departments (LHDs) and 28 states⁴ had signed BioSense data use agreements (DUAs), and DUAs were being negotiated with three other LHDs and 15 states.⁵ Seven states⁶ were not yet negotiating BioSense DUAs.⁷ Seven LHDs and 28 states⁸ received three-year (FY2012–2014) cooperative

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BioSense 2.0: A New Model for Improving Quality, Decreasing Costs, and Increasing Collaboration

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agreements from the CDC to develop BioSense capacity.⁹ Funding for these agreements resulted from cost savings realized by the CDC from basing the platform in the secure Amazon GovCloud. Each state with a DUA may make the platform available to LHDs within its jurisdiction.

BioSense 2.0 represents a new model for informatics partnerships among the CDC and health departments. If BioSense is successful, the model may be applied to other public health operations that are common across health departments, decreasing the costs of development and maintenance, and increasing the quality of systems by uniting experts from an array of health departments. 

For more information and for help in accessing or using the platform, contact info@biosen.se or visit <http://biosense2.org>.

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President's Column



By John Wiesman, MPH, CPH,
Director, Clark County (WA) Public Health

The board believes creating a minimum package represents multiple opportunities that local health departments should embrace...

Last December, NACCHO's board of directors passed a policy¹ supporting the development of a minimum package of public health services as called for by the April 2012 Institute of Medicine (IOM) report *For the Public's Health: Investing in a Healthier Future*.² The board believes creating a minimum package represents multiple opportunities that local health departments (LHDs) should embrace, while LHD leaders manage potential downsides. Furthermore, the policy gives NACCHO staff necessary guidance to represent the board and NACCHO members in the multitude of conversations that national organizations are having about a minimum package.

The NACCHO policy calls for the following:

- An evidence- and experience-based minimum package;
- Minimum services that are augmented by additional services important to a given LHD's community, especially as identified in its community health needs assessment and health improvement plan;
- Services "available nationwide from [LHDs] or by [LHDs] in conjunction with state health departments or through other partnerships";
- Identification of the costs associated with the package so that policymakers clearly understand the financial, technological, and human

resources necessary to ensure the capabilities and programs;

- Adequate financial resources to provide services;
- Use of the package to help LHDs and their governing boards plan and set priorities and follow "a framework for accountability and performance measurement, quality assurance and improvement and as the basis for standard setting by the Public Health Accreditation Board"; and
- Services that establish "a threshold and a consistent basis for investments in governmental public health activity."


As the board debated whether or not to support a minimum package, it determined that a minimum package would do the following:

- Articulate "a vision of where [LHDs] aim to be in terms of structure and service delivery";
- Provide "visibility and a brand for [LHDs], assuring consistency from one community to another";
- Substantiate "investments in governmental public health because policymakers would know what they were investing in and what the returns on investment would be";
- Provide a guide to communities if LHD budgets were reduced;

- Help LHDs determine workforce, training, and recruitment needs for the future;
- Help LHDs identify “a clearer idea of technology needs in terms of information systems, epidemiology and laboratory capacity, finance, and accounting management”;
- Help LHDs strengthen their quality improvement activities; and
- Be “essential to developing a common accounting and management framework for public health services.”

Some early efforts are occurring in response to the IOM report. Two states, Washington and Ohio, are developing a minimum package. In Washington, the minimum set flowed from a statewide public health committee appointed by the Secretary of Health to envision governmental public health’s future. That committee created an Agenda for Change.³ A subcommittee identified what it called a foundational set of public health services. Currently, that subcommittee is estimating the cost of that package. The plan is for the state’s State Association of County and City Health Officials (SACCHO) and other advocacy groups to use that package in developing a legislative approach to funding governmental public health. That approach is expected to span multiple legislative sessions given the ongoing impacts of the Great Recession.

In Ohio, the Association of Ohio Health Commissioners (AOHC), the Ohio SACCHO, developed a *Health Futures Report*⁴ in response to a growing need to critically assess the feasibility of sustaining 125 LHDs and to identify new approaches to improving effectiveness, efficiency, and accountability. The report explored methods to structure and fund local public health in Ohio. Once the report was released, the Ohio Legislature created a Legislative Committee on Public Health Futures⁵ charged with developing recommendations for legislative and fiscal policies that could be considered for inclusion in Ohio’s SFY 2014–2015 operating budget bill. The committee submitted a report to Ohio’s governor, Senate, and House on Oct. 31, 2012. Discussions about a practical way forward will likely be ongoing through spring 2013 to meet SFY 2014–2015 deadline of June 2013. In the interim, AOHC will be working with an academic partner to estimate the cost of the minimum package for Ohio.

NACCHO intends to learn from such ongoing statewide efforts, and as with accreditation, expects those efforts to inform a national dialogue that influences the eventual development of a national minimum package of public health services. 

Notes

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Executive Director's Column

By Robert M. Pestronk,
MPH, Executive
Director, NACCHO

*NACCHO invites
you to add your
"e" public health
headlines of the
future. Share
your headlines
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[www.naccho.org/
ecampaign](http://www.naccho.org/ecampaign)*


In a world gone digital and mobile, ePublic health is changing local health department (LHD) practice just as "e" has changed and will continue to change how other businesses do business and how people do business with business. Epublic health will be foundational to LHD infrastructure and practice.

Epublic health includes electronic health records, telemedicine, consumer health informatics, health knowledge management, virtual healthcare teams, mHealth, using grid computing for medical and population health, and healthcare and health information systems. Such emerging technologies will blur boundaries among credentialed and non-credentialed public health workers, their organizations, and the public as technology places capacities and content from ePublic health within reach of nearly anyone. Widespread acceptance of ePublic health will depend in part on continued sensitivity to, and laws protecting, privacy and confidentiality. Blithe "checks" in app acknowledgment boxes and a new generation of people whose life stories are offered freely on digital sites may herald a revised sensibility to these issues. Will users become inured to the regular reports of unauthorized data breaches and releases of personal information? Will they simply become accepted as a cost of doing business as the world goes increasingly digital?

Despite the importance of ePublic health to the ongoing practice of LHDs, and the excellent examples of LHD practice offered in this issue of *NACCHO Exchange*, hurdles block wider adoption of electronic technologies and practices

nationwide. Among these are inconsistent and poorly documented business processes and standards; paltry funding appropriated specifically for LHDs to influence, upgrade, and link their electronic systems with those being designed for and adopted by, for example, clinical and social service organizations; lack of funding for LHDs to scale up successful pilot projects to nationwide implementation; low priority given to LHD "e" within larger governmental "e" re-enterprising; inadequate workforce capacity and capability to monitor, use, and link to emerging "e"nvironmental changes; and lack of leadership from cross-sector partnerships even among the governmental "e-nterprise" that recognizes the importance of governmental presence locally, statewide, and nationally to ensure that communities, regardless of location, are protected, healthy, and secure.¹

For many reasons, the advancement and pace of adoption of ePublic health will vary by location. *Time* magazine characterizes the "new" America as "not so much the old *e pluribus unum*—out of many, one—but as [Ralph Ellison] says, one and yet many."² This aptly describes the public health enterprise with its complicated responsibility framework across domains of federal, state, and local governmental and non-governmental organizations and practice.

Through "crowd sourcing," can we envision a more complete picture of the e-future? Such a picture will help us build a bridge to that future. We can more easily pass the "puck" to where future colleagues will need to be.³ 

Public Health IT Preparedness: What do Local Health Departments Need to do Now?

**By James Coates, MS, RS, Informatician,
Cuyahoga County Board of Health**

A local health department's (LHD's) first step in preparing for health information technology is to determine the intent for involvement. If the LHD is providing direct care services and would like to contribute to the health information exchange (HIE), then the LHD might wish to sign up with a regional extension center (REC) and evaluate the need for a certified electronic health record system. However, if the LHD does not provide clinical services or does not meet the federal criteria set by the Centers for Medicare and Medicaid Services, then the LHD should determine if access to the HIE for population health surveillance is appropriate. If the determination has been made to access the HIE for surveillance purposes, then the LHD will be exposed to an abundance of data—so-called “big data.”

Big data can have positive impacts on public health but can also create potential problems that LHDs will need to address. Big data can lead to analysis of trends and clusters, which can lead to information and knowledge. However, data coming from the HIE can be error-prone, inconsistent, or incomplete. When analyzing these data, LHDs should watch for bias within the dataset and potential confounding factors.¹

Regardless of the LHD's decisions, enhancing workforce development around informatics will be important. LHDs can develop their informatics capabilities in several ways. Depending on time and resources, the LHD might consider one-year certificate programs, six-month training programs, or free online courses.

Once staff are trained or more comfortable with informatics, they may find opportunities to become involved at the local, state, or national level. Regions may want to collaborate among multiple LHDs or with healthcare partners. State health departments also often have committees devoted to health information technology. On the national level, there are activities like the Standards and Interoperability Framework Public Health Reporting Initiative,² which is a community-led initiative working to define reporting to public health from electronic health records. By participating in such efforts, LHD staff can help state and federal agencies better understand their day-to-day activities.

After all of the preparation and participation, how will LHDs know when they have made notable progress? There is always the opportunity to survey and collect data. Data on the readiness of LHDs to move forward, and data on LHDs already engaged, are very valuable. Based on the results of a survey, one could look at the characteristics of those LHDs that are not ready and conduct trainings or outreach to assist. LHDs should look for opportunities to get involved and take advantage of resources available through the National Association of County and City Health Officials' ePublic Health and Informatics workgroup.

Notes

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2. <http://wiki.siframework.org/public+health+reporting+initiative>

Notes

1. With respect to funding, federal and state governments, by remembering the extent to which LHD are an essential partner in the shared work to create conditions for better health, can do a better job crafting policies which ensure connections between LHD and the clinical care system (for example, by extending their own data sharing authorization agreements to them) and appropriating the funding for technology and workforce to make those connections meaningful. One need only contrast the approaches through which the American Recovery and Reinvestment and Affordable Care Acts have injected billions of dollars to help physician and medical care organizations migrate into the digital world with the absence of such support for governmental public health departments, which must analyze and communicate how policy and financial investments in a reforming healthcare system result in real-time health, efficacy, and efficiency.
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Beacon Communities and Local Health Departments

By William Pilkington, DPA, MPA, Cabarrus Health Alliance, The Public Health Authority for Cabarrus County, and Nick Macchione, FACHE, Director, County of San Diego Health and Human Services Agency



The Office of the National Coordinator for Health IT (ONC) has funded 17 “Beacon Communities” over three years to demonstrate the future vision of health information technology (HIT) to improve the quality, safety, and efficiency of healthcare and public health. The program will help the communities to build and strengthen their HIT infrastructure and exchange capabilities. The Beacon Communities will also generate and promote lessons learned that local health departments (LHDs) can use to inform and improve their work. This article highlights two Beacon Communities that have partnered with LHDs to improve public health by using HIT: (1) Southern Piedmont Beacon Community and (2) San Diego Beacon Community.

Southern Piedmont Beacon Community: Public Health Innovations

Community Care of Southern Piedmont, one of 14 regional coalitions that collectively comprise Community Care of North Carolina, is a local coalition of healthcare and community service organizations that share a mission to increase access to healthcare and other services for Medicaid and dually enrolled Medicaid and Medicare recipients in Cabarrus, Rowan, and Stanly Counties in North Carolina. The three LHDs within Community Care of Southern Piedmont are the Cabarrus Health Alliance, Rowan County Health Department, and Stanly County Health Department. Community Care of Southern Piedmont was chosen as a Beacon Community called “Southern Piedmont Beacon Community” (SPBC) in early 2010. SPBC engages in several advanced technology initiatives that focus on improving population health outcomes through improvements in public health infrastructure.

As a Robert Wood Johnson Foundation Common Ground Program grantee, the Cabarrus Health Alliance trained area LHD staff in business process analysis and collaborated with staff to develop a comprehensive set of clinical requirements for public health electronic health records (EHRs). The Rowan County Health Department was an early adopter of EHR, and the Stanly County Health Department is developing an EHR using Common Ground clinical requirements and other best practices.

Initial SPBC activities focused on population-health approaches to several chronic diseases important to the communities served by Community Care of Southern Piedmont. Following the implementation of these initiatives, SPBC has turned its attention to several public health-focused activities, which are the focal points for the Beacon Communities for the Public Health project.

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Beacon Communities and Local Health Departments

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LHDs often decide about resource allocation, program prioritization, and disease control measures based on outdated data. SPBC is involved in two related projects to improve data timeliness for public health decision-making:

- **Public Health Portal**—In collaboration with the Informatics Center at Community Care of North Carolina, SPBC is developing a public health portal to graphically geo-locate information from health and demographic databases to help identify trends and aid in the targeting and development of interventions to prevent chronic diseases. With the portal (<https://www.communitycarenc.org/nc-hip/>), the goal is to give physicians, public health workers, and policymakers real-time data to help them respond to the health needs of the community.
- **Daily Disease Report**—SPBC is also developing a public health surveillance tool that relies on school nurses to capture symptom data for children in Cabarrus County schools. By 5:00 PM each evening, a list of the top-10 reported health concerns are compiled into a community-wide report that tracks disease incidence across all schools.

In addition, SPBC is exploring methods of automating health education. The public health focus on health promotion and chronic disease prevention requires considerable health education, both in public health's clinical functions and its community-based interventions. Typically, health education is staff-intensive, often requiring repetitive instruction. Given budget constraints and the related need to enhance staff productivity, LHDs must adopt innovative approaches to the provision of health education. With innovation in mind, SPBC developed an automated health educator/avatar named "Anna," which is in use at Cabarrus Health Alliance, Rowan County Health Department, and Stanly County Health Department.

San Diego Beacon Community: Building Better Systems to Improve Public Health

The County of San Diego Board of Supervisors launched a major initiative in 2010 called "Live Well, San Diego!" to improve the health and well-being of the 3.2 million county residents. The ambitious 10-year plan is the county's blueprint for improving the quality of life by promoting healthy, safe, and thriving communities. The plans to build better health include four major strategies: building better service delivery systems, supporting positive healthy choices, pursuing policy and environmental changes, and improving the culture within county government.

As part of building a better delivery system, the County of San Diego Health and Human Services Agency (HHSA) is an active partner in the local health information exchange, the San Diego Beacon Community (SDBC). This partnership has enhanced electronic sharing of information between the local healthcare community (i.e., providers, hospitals, and laboratories) and Public Health Services (i.e., the component of HHSA that is the LHD and also the Local Emergency Medical Services Agency per California law serving all of San Diego County). SDBC is expanding electronic laboratory reporting, syndromic surveillance, and submissions to the local immunization registry and is improving pre-hospital data sharing for patients being transported to local hospital emergency departments.

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Beacon Communities and Local Health Departments

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Through SDBC participation, hospital laboratories will be reporting communicable disease information electronically to Public Health Services. The benefits are timely case reporting and reduced manual case processing inaccuracies and costs.

At present, only nine San Diego hospitals are reporting syndromic surveillance information for early detection of acute public health events and situations. The SDBC collaboration will expand the number of hospitals and other healthcare providers contributing these data to Public Health Services and modernize some of the data formats by adopting a standardized HL7 message format to help satisfy “meaningful use” requirements.


The San Diego Immunization Registry (SDIR) is a robust immunization registry that can exchange HL7 messages. Some healthcare providers have developed protocol-based interfaces with SDIR. Building these connections directly between providers and SDIR to help providers prepare for Stage 1 Meaningful Use becomes cost-prohibitive at \$10,000 to \$15,000 per provider. To control the costs of interface development and to reduce dual-data entry burden for providers without an interface, SDBC participation will allow for coordination of the data exchange to facilitate reporting to SDIR. Using this interface, providers participating in SDBC will be able to report to the immunization registry and query immunization records seamlessly.

In addition to robust immunization management and forecasting tools, SDIR also has a module for calculating and reporting BMI based on height, weight, and demographic information entered into SDIR on clients with records in the registry. Prior to HHSA's partnership in SDBC, providers had to enter height and weight data manually into SDIR. Electronic interfaces have been created to transfer BMI data from providers to SDIR to facilitate monitoring and reporting on obesity rates across the region.

Although some local emergency medical services providers have their own EHRs,

most cannot easily exchange data with other emergency departments.

Information is currently exchanged verbally, manually, and by computer printouts. In close cooperation with HHSA, SDBC is developing a two-way electronic information exchange between pre-hospital providers and local emergency departments. The rapid electronic data exchange en route to an emergency department reduces the time needed to treat and manage patients, in particular those experiencing acute myocardial infarction. Hospitals are already realizing cost savings in the more efficient activation of cardiac catheterization teams.

HHSA's full participation in SDBC allows for enhanced communication among healthcare providers, Public Health Services, and the broader community. The data shared are part of a better system to protect the public from communicable and chronic diseases and enhance resilience in emergencies. 

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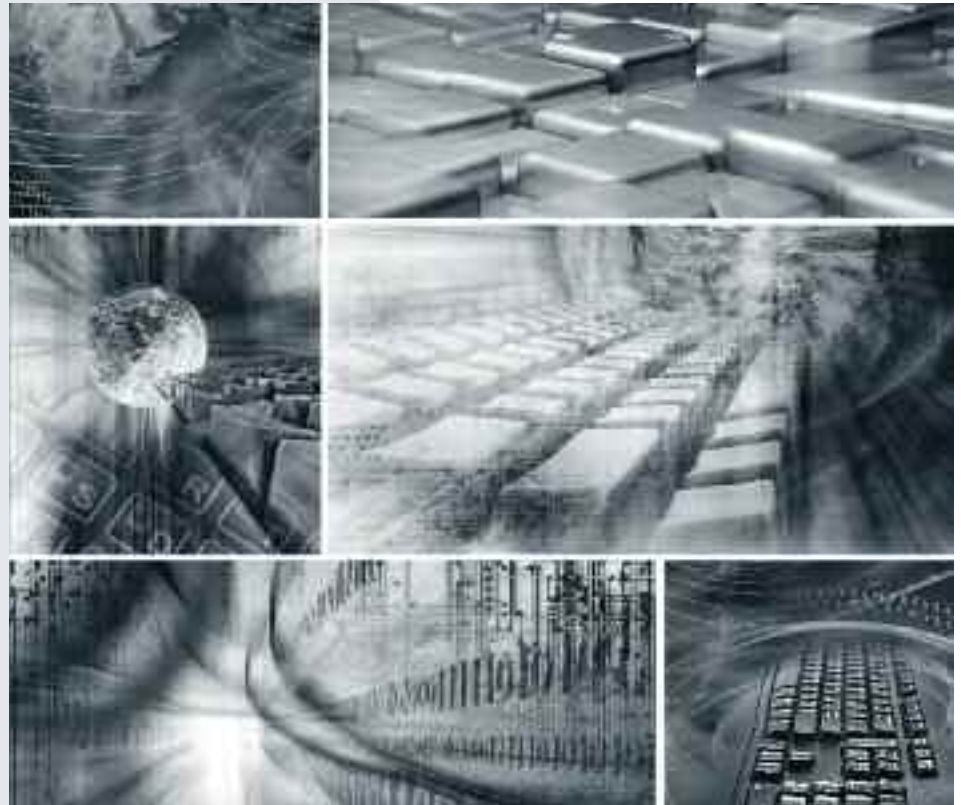


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Why Should Local Health Departments Care about Meaningful Use?

By Arthur Davidson, MD, MSPH, Director, Public Health Informatics, Epidemiology and Preparedness, Denver Public Health



Escalating healthcare costs continue to chew away relentlessly at the nation's fragile economy. Simultaneously, local health department (LHD) budgets have progressively been whittled to smaller amounts each year. The underlying context is a misaligned healthcare system built to incentivize expensive utilization with minimal emphasis on prevention and earlier intervention. The Affordable Care Act¹ (ACA) seeks to transform the system and emphasize prevention and treatment. Before ACA, the American Recovery and Reinvestment Act (ARRA) devoted significant incentive funds to enable transformation by helping eligible providers and hospitals adopt and "meaningfully use" certified electronic health records (EHRs).² The Office of the National Coordinator for Health Information Technology (ONC) and Centers for Medicare and Medicaid Services administer the program and have invested nearly \$10 billion over two years through incentive payments to providers and hospitals. Although LHDs were not the target of Congressional incentives in ARRA, LHDs now have opportunities to partner with eligible providers and hospitals and should plan to comply with specific federal standards to meaningfully exchange information with EHRs.³

Why Should Local Health Departments Care about Meaningful Use?

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Several LHDs around the country create value through analysis of measures collected under meaningful use; LHDs should find opportunities to follow such early adopters.

How much money has come to your jurisdiction? Should your LHD develop plans to use the data collected by certified EHRs?

Local and state health departments often have limited funding for infrastructure investment to meaningfully use data. Public health systems need collective strategies to maximize value from limited resources and investment opportunities. Within each jurisdiction, unique and creative opportunities exist for partnering on technology investments. LHDs need to engage in conversations to help ensure that federal investments support public health capacity-building. Greater access to data may help LHDs monitor health and disparities in their communities, and access to EHR data means potentially rapid and comprehensive calculation of public health indicators. One may argue that such data do not truly represent an entire population; for example, people with limited healthcare access would be under-represented in the EHR. In time, however, the ACA and locally determined insurance exchange solutions promise to increase the percentage of individuals covered and thus included in EHR-based surveillance. As providers and hospitals adopt and implement certified EHRs, opportunities for LHDs to access, analyze, and act upon information collected in an EHR expand.

If LHDs could review, retrieve, aggregate, and monitor EHR-generated data, what would be their focus? Stage 1 Meaningful Use has focused on three areas in population and public health: (1) reporting to immunization registries; (2) electronic laboratory reporting for eligible hospitals; and (3) reporting to syndromic surveillance systems. Data from such reporting are potentially valuable resources for assessing the health of the population in an LHD's jurisdiction. With more continuous reporting expected in Stage 2 in 2014, EHR aggregated data would allow some local and state health departments to build extensive, near real-time monitoring.

Public health officials need to understand the methods, challenges, and value to their LHDs to drive their strategic involvement. EHR-derived summary reports have significance not only to LHDs but also to community groups and individual patients. Meaningful use includes tens of measures in areas broader than immunization, electronic laboratory reporting, and syndromic surveillance. Several LHDs around the country create value through analysis of measures collected under meaningful use; LHDs should find opportunities to follow such early adopters.

The New York City Department of Health and Mental Hygiene has been at the forefront of using these data sources for nearly a decade. Spurred originally by syndromic surveillance activities, the LHD's links with healthcare providers have grown exponentially as the Primary Care Information Project⁴ established data-sharing agreements with numerous providers throughout the region.⁵ This system enables secure queries for EHR-aggregated information, clinical decision support, and point-of-care alerts based on specific patient conditions. For example, the LHD was able to identify patients affected by a recall of the antibiotic metronidazole and sent messages to alert specific providers and practices. As of September 2012, the system was projected to have over 600 practices with 2,500 providers, representing more than three million New Yorkers. The system helps public health officials evaluate population health and quality improvement activities throughout the ambulatory care network. As multiple EHR vendors build exchange features, the LHD promotes value by reusing meaningful use investments.

Another vanguard is the Massachusetts Department of Public Health. PopMedNet⁶ is the underlying architecture for a public health-focused distributed query network, "MDPHnet".⁷ PopMedNet is flexible in creating distributed networks using data from any source, with menu-driven queries, role-based access control, full auditing, and high security and policy compliance. The public health network allows querying of data from two large multi-specialty practices with over a million patients. The ONC is funding the

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Why Should Local Health Departments Care about Meaningful Use?


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distributed query network, which is highly concordant with the goals of QueryHealth,⁸ another ONC-sponsored project.

Another federal agency (the Centers for Disease Control and Prevention) has funded dozens of Community Transformation Grants (CTG) around the country. Denver Public Health was fortunate to receive a CTG award; the LHD proposed to build a community registry for cardiovascular disease risk from providers and hospitals receiving meaningful use incentives. Denver's data flow needs were very similar to another group working toward a different purpose. The local National Institutes of Health-funded Clinical Translational Sciences Award (CTSA) to the University of Colorado Denver has been creating a data-sharing network from the same providers and hospitals for the purpose of research. Both projects need EHR-collected data. Working with affiliated providers and hospital organizations, EHR-collected meaningful use data will contribute to a community-based registry for body mass index, hypertension, high blood cholesterol levels, and tobacco use status. Data transmitted to these registries include information about demographics, geo-coded place of residence, vital signs, diagnosis, treatment, and healthcare utilization.

Through a data use agreement, affiliated institutions share information for the purposes of public health surveillance. The same infrastructure that supports public health surveillance may also support investigational review board-approved research studies. The primary focus is to leverage the federal investment in certified EHR data collection to serve public health and research needs of the local community. A key component is to define a common and extensible infrastructure to support storage and analysis (e.g., query/response). In Denver, more advanced users of EHR technology for research and quality improvement (i.e., Kaiser Permanente of Colorado) are helping define methods and educating

less experienced providers on ways of regional data-sharing to benefit CTG, as well as CTSA. In other communities, hospital tax-code requirements to support community benefit may be another incentive to bring disparate players to a discussion about local possibilities for exchange. Federal incentives exist for LHDs' data partners; LHDs must now advocate to have those incentives support public health interventions or evaluations.

The road to meaningful use will be long in general—and even longer for LHDs. Limited resources preclude grandiose efforts. Each LHD needs to establish its place in the local vision being created by incentives to eligible providers and hospitals. LHDs have a role in building a local learning healthcare system⁹ and its digital solutions.¹⁰ Conceptual models for sharing data to benefit public health have been elaborated.¹¹ To achieve the level of health exchange required for meaningful public health benefit, each LHD must build local trust and facilitate discussions. By establishing trust, groups may partner to create collective value through information sharing. Meaningful use for LHDs is more than just three new data feeds for immunization, laboratory reporting, and syndromic surveillance—providers and hospitals are creating 21st-century surveillance tools for a broad array of public health challenges. 

Notes

1. Pub.L. 111-148, 124 Stat. 119, to be codified as amended at scattered sections of the Internal Revenue Code and in 42 U.S.C.
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Txt 2 Improve Health: Public Health – Seattle & King County's SMS Texting Initiative

By Hilary Karasz, PhD, Texting Initiative Project Director, and Sharon Bogan, MPH, Texting Initiative Program Manager, Public Health – Seattle & King County



At local health departments (LHDs), mobile phones allow staff to communicate via text, e-mail, or voicemail in way that is convenient, effective, and efficient, but are LHDs thinking of how to use these powerful mobile technologies to improve communication with county residents to improve their health? The term “mHealth” is the use of mobile devices to improve health outcomes with tools such as text messaging with health emergency information, disease management apps, and personal sensors that collect health data in real time. The implementation of mHealth has been spreading quickly in consumer health and clinical medicine, yet its adoption by LHDs has been much more limited. Reasons for this may include a lack of understanding of potential applications of mHealth in the public health setting; inadequate scientific evidence about effective mHealth solutions; and uncertainty regarding the value of mHealth.

At Public Health – Seattle & King County, communications researchers have investigated how to use mobile technologies to close communication gaps with public health audiences and reduce health inequities. Research efforts have centered around text messaging because text-capable cell phones are ubiquitous, and texting rates among low-income populations and people of color are higher than for the population at large, making text messaging a particularly useful and appropriate communication channel.¹ The LHD's work has focused on understanding audience needs, technical issues and costs, and legal and compliance issues associated with running text messaging programs. The following are some key findings.

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Txt 2 Improve Health: Public Health – Seattle & King County's SMS Texting Initiative

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Many public health clients may prefer to communicate with the LHD via text messaging.

Audiences: Significant differences in text messaging habits and needs exist among a variety of audiences including the general public, Deaf and Hard of Hearing, Spanish-speaking immigrants, rural communities, and Native American residents. Customizing messaging programs and marketing them closely to the target audience's needs and desires increases support.²

Topics of Interest: Residents are interested in a variety of topics; however, a significant majority are interested in receiving public health emergency notification via text. Other interest areas include disease management (e.g., smoking cessation, diabetes management); reminders (e.g., routine testing or appointment reminders); help with medication adherence (e.g., prompts to take medication) and support (e.g., communication via text from provider to client).

Technical Issues and Costs: Text messages may be sent one by one from a computer or from a cell phone. However, a commercial vendor can assist in distributing bulk messages by providing a Web-based database to manage subscriber lists of cell phone numbers. Typical vendor products allow for customization and scheduling of messages to groups of individuals within the database. Public Health – Seattle & King County used a vendor-based system to build an emergency communications program for its 1,500 employees. The agency also used a vendor-based system to send text message prompts to parents of children who needed immunization reminders. Differences exist in customer service, delivery reliability, and overall functionality of text messaging services, so LHDs should carefully select a vendor.³

Legal Issues: Many public health clients may prefer to communicate with the LHD via text messaging. However, depending on the client and nature of the communication, some of the message content could be sensitive. Like all forms of communication, text messaging is not 100-percent secure. Federal privacy and security rules do not expressly prohibit texting protected health information via text message, but LHDs must take steps to protect content and reduce risk.⁴ Procedures are also needed to ensure proper documentation of healthcare communication and client protection related to opting in and out of the service.

Mobile health has potential to improve population health, but LHDs must invest in and explore different ways of applying mHealth tools like text messaging to serve public health audiences, build an evidence base and share what works, and document the return on investment to improve the health and well-being of communities. 

For more information, visit www.kingcounty.gov/health/texting.

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Glossary of ePublic Health Terms

Big Data—The capture, storage, and management of large datasets that can be analyzed for correlations and valuable change in health improvement.

Business Process Analysis (BPA)—The examination of business functions and tasks to meet objectives, expected outcomes, and opportunities for improvement through the redesign or development of business and technical solutions.

Electronic Health Record (EHR)—An electronic repository of an individual's health information generated by one or more encounters in any care delivery setting. An EHR maintains information about an individual's lifetime health status and healthcare, such as patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and related reports.

ePublic Health—The management and use of information through policy, standards, practice, governance, and technology that advance the United States' ability to protect and improve public health. Featuring the use of decision-support tools such as syndromic surveillance, EHRs, documentation systems, mobile devices, websites, and social media, ePublic health improves access to and distribution of health information. These tools can improve the health and well-being of populations by enhancing preventative measures, informing policy and personal health behavior decisions, and clarifying issues such as access, quality, continuity, cost of care, and the social determinants of health.

Health Information Exchange (HIE)—The mobilization of healthcare information electronically across organizations within a region or community. The goal of HIE is to facilitate access to and retrieval of clinical data to provide safer, more timely, efficient, effective, equitable, and patient-centered care.

Health Information Technology (HIT)—The application of information processing involving both computer hardware and software that manages storage, retrieval, sharing, and use of healthcare information, data, and knowledge for communication and decision-making.

Integration—The coordination or unification of systems supporting distinct practices across an enterprise.

Interoperability—The ability of health information systems to work together within and across organizational boundaries to advance the effective delivery of healthcare for individuals and communities.

Meaningful Use (MU)—The use of certified EHR technology to improve quality, safety, and efficiency; reduce health disparities; engage patients and family; improve care coordination and population and public health; and maintain privacy and security of patient health information.

Mobile Health (mHealth)—The use of wireless technologies, such as mobile phones and tablets, in the practice of medicine and public health to enhance the delivery of services and improve outcomes.

Public Health Information Network (PHIN)—A national initiative from the Centers for Disease Control and Prevention to implement a multi-organizational business and technical architecture for public health information systems.

Public Health Reporting Initiative (PHRI)—A standardized approach to electronic public health reporting that addresses the needs of several different reporting use cases, with the long-term goal of reducing the difficulty (to both providers and public health agencies) of implementing electronic versions of the broad spectrum of public health reporting.

Learn More through
the Following
Organizations:

Healthcare Information
and Management
Systems Society
(HIMSS):

www.himss.org

Joint Public Health
Informatics Taskforce
(JPHIT):

www.jphit.org

National Association of
County and City Health
Officials:

[www.naccho.org/
topics/infrastructure/
informatics/](http://www.naccho.org/topics/infrastructure/informatics/)

Office of the National
Coordinator for Health
Information Technology
(ONC):

www.healthit.hhs.gov

Public Health Data
Standards Consortium
(PHDSC):

www.phdsc.org

Public Health
Informatics Institute
(PHII):

www.phii.org

Good Public Health Is Worth Sharing

NACCHO's Toolbox is a free, online collection of local public health tools produced by members of the public health community. Tools within the Toolbox are materials and resources public health professionals and other external stakeholders can use to inform and improve their work in the promotion and advancement of public health objectives.

Visit NACCHO's Toolbox at:
www.naccho.org/toolbox



About NACCHO Exchange

NACCHO Exchange, the quarterly magazine of the National Association of County and City Health Officials (NACCHO), reaches

every local health department in the nation. It presents successful and effective resources, tools, programs, and practices to help local public health professionals protect and improve the health of all people and all communities.

Mailing and Contact Information

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



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ENVIRONMENTAL IMPACT STATEMENT

1225 LBS OF PAPER MADE WITH 25% POST CONSUMER RECYCLED FIBER SAVES...

	1,242 lbs wood	A total of 4 trees that supplies enough oxygen for 2 people annually.
	1,814 gal water	Enough water to take 105 eight-minute showers.
	1mIn BTUs energy	Enough energy to power an average American household for 5 days.
	377 lbs emissions	Carbon sequestered by 4 tree seedlings grown for 10 years.
	110 lbs solid waste	Trash thrown away by 24 people in a single day.

