
Introduction: Setting the Stage

Purpose

This series of informational briefs are intended to inform middle managers and senior leaders within local and state health departments about some of the key opportunities and challenges in how information is managed and used to inform public health practice and action. The briefs were developed by the Joint Public Health Informatics Taskforce (JPHIT, www.jphit.org), a consortium of ten public health associations seeking to improve public health practice through informatics.¹

This informational series is intended to:

1. Convey basic concepts and current thinking on several key issues related to the information role of public health agencies.
2. Provide a picture of where public health agencies will need to go in response to expanding information responsibilities, new technologies, tighter budgets, and shrinking workforces.
3. Provide concrete action steps that leaders and managers can take within their agency.
4. Most important, serve as a catalyst for collaborative discussion and action at all levels: local, regional, national, and even international.

Background

Healthcare is facing an explosion in the availability of electronic data and in new methods to transport, aggregate, analyze, and effectively use data. Public health must be prepared to make use of increasingly digital data and to move forward in step with these developments: its systems must be modernized; its workforce must be properly trained; and its vision updated to ensure that maximum leverage can be achieved from these new capabilities. The CMS EHR Incentive Programs have brought new exposure to public health data reporting, interoperability, and health information exchange. These new requirements offer an opportunity for public health agencies (PHAs) to build on this visibility to improve its capabilities.

This change, however, will be an incremental process for most agencies. With limited funding, and ever-evolving requirements, modernizing public health systems, staff, and information management processes will feel like a continuous activity, at least for the foreseeable future. The larger healthcare environment is still adjusting to the changes brought on by healthcare reform, increasing consumer engagement, changes in the local, national, and international economy, ongoing standards development, and continuous technology advancements. With incremental change comes continuous assessment; PHAs must develop methods to more nimbly scan their environments and determine where changes in the information environment *outside* the agency require change *inside* the agency.

¹ JPHIT worked in partnership with HLN Consulting, LLC (www.hln.com) to develop these briefs.

Public health practice must become “informatics-enabled.” Information technologies have permeated most aspects of life in industrialized societies, making it possible to change the ways in which we capture and manage significant data for public health action, transform those data into useful information, and communicate with numerous constituencies. PHAs need to be not only more informatics savvy, but also more skilled in information analysis and information sciences generally. A marked increase is anticipated in the scope and the volume of data relevant to measuring and monitoring population health, as well as an increasing number and sophistication of other entities relying on population health data for accountability, quality improvement, and other purposes. Health departments will need to partner with these organizations, and bring expertise that is on par with their partners.

While data exchange between systems continues to be a major focus, it is but a means to an end. PHAs will be expected to *do* more with the data they collect, and in turn, *provide more data* to other stakeholders in the healthcare enterprise. To do this, PHAs will have to think about not only the mechanisms they support to exchange data, their capacity to understand, transform, assimilate, and explain data, but also new audiences who have not traditionally been involved in public health data use.

Key Information Capabilities

Below are some key trends and capabilities that will drive the transformation in public health information technology and its use over the coming years. Each of these is discussed in more detail in the separate briefs that follow:

Big Data – As more and more data flows in and around the healthcare ecosystem, PHAs need to be prepared to receive, process, and analyze more and more data, some of it qualitatively different than current data streams. The tools and skills necessary to do this may differ from current tools and training; just because there is *more* data it is not necessarily *better* data. New techniques and attitudes will need to be developed to deal with both volume and variable quality in data received.

Consumer Engagement – The surge in consumer access to healthcare data will continue to sweep across the healthcare ecosystem. For public health, this means greater expectations on behalf of consumers for population – and even individualized – data about their health, prevention, and risks. Social media will add yet another dimension to consumer health, whereby citizens worldwide will be able to construct their *own* models of public health situational awareness and their *own* health education material which may or may not have efficacy. PHAs need to be prepared to serve these new consumer markets with reliable and responsive data and advice

Interoperability: Semantics – Without common understanding, the goals of information sharing cannot be met. PHAs need to aggressively move to standards-based semantics and coding, and away from local, proprietary, or un-coded data.

Interoperability: Transport – The first challenge of system-to-system interoperability is compatible transport between systems. PHAs need to plan strategies to simplify and leverage transport pathways, whether this means reducing the number of transport protocols in play or looking to more efficient channels such as health information exchanges (HIEs) or public health gateways through which external transmissions are directed.

Clinical Decision Support (CDS) – Decision support is important not only when applied to an individual patient in a clinical setting (CDS), but also when applied to population-based data to evaluate groups of patients for certain conditions or exposures (population decision support). PHAs will need to become more knowledgeable about using decision support techniques to mine data, as well as about providing CDS services to the clinical community to maintain a population’s health. Managing CDS knowledge and rules is a shared responsibility between public health and the clinical community.

Information Architecture – Greater interoperability, and simply *more* data, will require PHAs to consider the structure and coherence of its data stores, and the ways in which data is conceptualized, stored, and visualized. Data integration will become the rule not the exception as public health information systems continue to overcome programmatic stovepipe constraints.

Re-visiting Public Health Registries – This extended brief brings together the capabilities discussed in the other briefs, and shows how they impact the design and operations of public health registries.

The line between public health and healthcare will become increasingly blurred in the future, so that people will be less likely to think about two systems, or competing approaches, to improving health. As payors, purchasers, state and federal policy makers, and the public itself increasingly demand improved health outcomes for the dollars spent, both public health and healthcare will be converging around population health improvement and community-centered health. It will be important for public health to stake its claim and be able to clearly describe the role it plays in partnering with the healthcare system to improve population health.

Action Steps for State and Local PHAs

What actions can public health managers and senior leaders take to develop information capabilities that will support their effectiveness in the future? JPHIT recommends the following:²

- **Create a strategic plan for information architecture, management, and technology**, ideally as part of the health department’s overall strategic plan. The informatics vision and strategy needs to include the actions described below, and should be used to guide strategies for developing a more integrated and agency-wide approach to information management and IT

² Actions marked with an asterisk were also cited as conclusions in the January 2013 report: *Assessing the Status and Prospects of State and Local Health Department Information Technology Infrastructure*, HHS Office of the Assistant Secretary for Planning and Evaluation, available from http://aspe.hhs.gov/sp/reports/2013/PublicHealthInformatics/hitech_rpt.cfm.

investments. An agency-wide task force or other form of broad input will be critical to successful planning and implementation.*

- Related to the strategic information management plan is to **develop an overall information architecture** for the agency. This is not just about IT networks, but about ensuring technologies and policies are in place and structured to support implementation of the strategic plan.*
- **Upgrade information systems** to use nationally recognized vocabulary standards and code sets, especially those used by healthcare, such as those specified for use in the Meaningful Use program, or recommended by CDC. This will help ensure interoperability among public health information systems, and between public health and healthcare. This may require conducting an inventory of the standards and data exchange partners for each information system within an agency.*
- **Conduct rigorous business process analysis** to document current information flows and staff workflows, uncover inefficiencies, and identify improved ways of “doing business.” *
- Use the results of the business process analysis to **carefully define the information system requirements** needed to effectively support the work being done. Without careful analysis of work and the systems requirements needed to support that work, agencies risk having systems that impede efficient workflow and frustrate staff. *
- **Identify ways to automate routine data management tasks**, such as data quality checks. As the volume of data increases, staff need to be freed up to focus on effectively *using* the data to drive program and policy decisions.
- Work with professional associations and neighboring jurisdictions to identify opportunities for **joint development of shared IT solutions**. This might include exploration of hosting shared solutions in the cloud as a way to minimize costs and other hosting issues.
- **Select a limited number of transport protocols** for all information exchanges with your community partners. This not only saves effort and money for your agency, but will likely be welcomed by your partners.
- **Identify new sources of data** that could contribute to a more comprehensive understanding of community health status, both risks and assets. *
- Explore options for **enabling two-way communication with consumers**, including access to easily understood population health, environmental health, or other appropriate data and models, such as social media, for obtaining input from consumers.
- Ensure appropriate staff members have **access to informatics training** or other sources of knowledge and best practices. The public health associations can suggest good sources for topics of interest to your staff. *

Leadership Steps for National Agencies and Organizations

- Work with state and local agencies to identify opportunities for **joint development of shared IT solutions**.
- Identify, compile, and disseminate **best practice information** to assist PHAs in achieving their new data management imperatives. Leverage routine publications, events, conferences, and

meetings to ensure wide-spread exposure to these ideas for policy, management, and technical audiences. Consider working collaboratively to establish a clearinghouse/library of business process descriptions, system requirements and specifications, and even prototype requests for proposal (RFP) for local PHAs to access and use to jump start their efforts.

- Continue to **actively participate in standards development and harmonization activities**, and to communicate broadly within public health about these efforts.
- Develop **resources for state and local PHAs concerning the legal barriers** at both the federal and state/local levels for sharing data between programs and with external partners.
- Consider embarking on the **development of a national public health information architecture**. Consider how current activities can be redefined, combined, or leveraged to move in this direction.

This paper is part of a series of information briefs for local and state public health officials and managers, developed by the Joint Public Health Informatics Taskforce in partnership with HLN Consulting, LLC. The full series of seven briefs can be downloaded at no cost from www.jphit.org.