

VERSION 2.0 WORK IN PROGRESS: Evidence Related to Public Health Data September 2019



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This document represents findings from a scan of the literature related to public health data-related activities by health departments. It is not meant to be an exhaustive search. If there are other resources on this topic of which you think PHAB should be aware, please contact Jessica Kronstadt at jkronstadt@phaboard.org.

Data and Public Health Agencies

According to Dr. Anne Schuchat, Principal Deputy Director of the CDC, "Data are truly the engine of public health. Without appropriate data, we don't know how to chart the course ahead, how to know if we are headed in the right direction, or when and where we may have made a wrong turn."¹

While surveillance is a core component in health departments' data work, Dixon et al. have noted that in addition to surveillance, public health informatics is engaged in a number of other activities including:

1. "implementation of electronic health record systems and health information exchange to enable successful achievement of 'meaningful use' criteria, such as electronic reporting of notifiable diseases;
2. measurement of a wider array of health indicators, including social determinants through 'big data' analysis of multiple community data sources; and
3. development, implementation, and assessment of patient-centered technologies aimed at supporting health and well-being in the changing landscape of health care delivery."²

The effective use of data is also central to the concept of Public Health 3.0. Wang and DeSalvo say that supporting Public Health 3.0 "will require cross-sectoral collaboration, integration of data systems, leveraging of advanced analytic tools, and establishment of measures that inform continuous advancements in individual and community health." They establish the following principles for data/informatics systems:

- timely and geographically granular;
- action-oriented;
- spanning multiple sectors;
- mindful of social determinants of health and equity; and
- nonproprietary and interoperable.³

The term “informatics-savvy health department” is a term designed to encapsulate the data work of public health agencies. As part of the informatics-savvy self-assessment, the following domains have been identified:

- project management;
- information system profile;
- standards adoption and implementation;
- information exchange;
- data management and quality assurance;
- IT system plans and budget; and
- and shared services.⁴

Laventure et al. specify the following as “arguably the most important element of an informatics-savvy health department: having an overall documented informatics vision, strategy, and governance to ensure that your information systems support the overall mission of the public health agency and that you have designated roles and responsibilities to accountably implement that vision and mission.”⁴

Use in CHAs, CHIPs, and Accountability

CHAs & CHIPs

Health departments use data to paint a picture of the communities they serve in their community health assessments (CHAs). According to the 2016 NACCHO Profile, 80% or more of local health departments report using the following types of data in their CHAs:

- socioeconomic characteristics;
- social and mental health;
- community perceptions of health; and
- environmental health indicators.⁵

The NACCHO Profile data also revealed that about 60% of local HDs use data to describe health disparities in their jurisdiction, though the percentage is much higher among larger HDs.⁵

An examination of the community health improvement plans (CHIPs) of accredited health departments noted that when it comes to the indicators that communities are using to track their progress, they cover a wide range of topics. However, they are less likely to include measures related to mental health, environmental quality, and social determinants than they are to focus on items such as nutrition/obesity/physical activity, and access to care.⁶

Population Health Outcomes & Accountability

Tracking population-level data is a key component of accountability. In their 2011 report, the IOM stated: “The committee believes that measuring health outcomes and their determinants at both the individual level and the community level and in multiple sectors is an essential ingredient, with policy and resources, in motivating change, mobilizing action, measuring progress, and improving performance.”^{7(pp 11)} Put another way, “Measurement has been at the heart of every major strategic health and health care improvement initiative, ranging from childhood immunization and high blood pressure control, to reducing tobacco use and heart attack deaths, improving the safety and effectiveness of medical and surgical services, and advancing air and water quality.”^{8(pp 36)}

It may also be useful to couple population health outcome data with performance measures, which would allow communities to track and evaluate strategies designed to improve population health.⁹ There are challenges with identifying the most valuable data to include in the CHA/CHIP process. For example, it may be difficult to access data on a sub-county level.¹⁰ While there are several current efforts to identify consensus measures, there is still a wide range of measures in use, particularly indicators of social determinants of health.¹¹

The IOM report outlined several common criteria to assess indicators, including: “methodologic soundness (validity, reliability, and whether collected over a long period), feasibility (available or collectible), meaningfulness (is the measure linked to an evidence-based intervention, and is it relevant and actionable) and importance (is it an important outcome, and is the outcome linked to evidence-based interventions?).”⁷(pp 48) Others have highlighted factors such as: ability to catalyze collaboration and action among other sectors, being asset driven; culturally and linguistically appropriate and sensitive;¹² understandability;⁸ and the magnitude of the health disparity/degree to which health equity would be achieved.¹³

Strategies and Challenges with Data Collection, Sharing, and Analysis

When collecting data, it is advised that entities pay particular attention to selection of appropriate methods, documentation of the collection process, data backup and security, and testing of new data collection methods. In addition, agencies should be mindful of the “data collection environment” to see if there are barriers that may limit the participation of populations experiencing inequities.¹⁴ It is also important to balance the desire to have comprehensive datasets with concerns about privacy and confidentiality, which highlights the importance of having strong data governance in place.¹⁵

Several studies acknowledge the importance of sharing data across community partners^{16, 17} and the need to gather local perspectives to provide context to using big data sources.¹⁸ On the state level, in the 2016 ASTHO Profile, almost two-thirds of state health agencies reported sharing data with their local health departments, and smaller percentages reported sharing with other agencies (53%), clinical providers (49%) and other states (32%).¹⁹

In 2011 the IOM noted a growing need for modelling to help understand the complex causal pathways that affect population health and the potential for strategies to improve the health of communities.⁷ When analyzing data, it is important to be mindful of several common challenges, including ones related to attribution, data sources, statistical accuracy, risk adjustment, setting benchmarks, potential for gaming, and validity.⁸

In their 2019 report, the Council of State and Territorial Epidemiologists (CSTE) describes several key challenges facing the nation's public health surveillance system, including manual methods of data exchange; siloed systems; and absence of EHR integration with public health.¹ They articulate five key principles for transforming the national surveillance system:

1. Enterprise approach to data systems modernization;
2. Interoperable data systems;
3. Security to protect patient data;
4. Workforce that is prepared for the information age; and
5. Partnership & innovation with the public and private sectors¹

Emerging trends

The literature includes various examples of innovative use of data for public health purposes, including:

- Using GIS to do location-allocation modelling to determine how to optimize the availability of naloxone;²⁰
- Engaging in data philanthropy, or the use of corporate data for public good, such as a Kenyan cell service provider helping develop a map to show spread of malaria;²¹
- Monitoring population mobility related to H1N1 and Ebola and helping with emergency response following Boston marathon and Haiti earthquake;²² and
- Monitoring twitter feeds to conduct influenza surveillance.¹⁵

EHRs provide another useful source of data for conducting communicable disease surveillance, identifying gaps in quality care (including failure to follow guidelines), and contributing to health impact assessments.²³ To the extent that EHRs are capturing patient-level social determinant of health data, they can also help create "community health records" for neighborhoods and regions.²⁴

There is also a trend towards open data, which allows data to be available in non-proprietary formats, which are searchable and can be accessed without data use agreements.²⁵

Workforce

Employees working in informatics and IT comprise a small portion of the governmental public health workforce. For example, among state health agency central offices, only 1.1% of employees identify themselves as public health informatics specialists and 3.4% as working in IT/information systems. The percentages are smaller among local health departments.²⁶

An analysis of PH WINS data suggests that although public health informatics specialists generally report they have skills necessary for their jobs, other health department employees who are involved in gathering and using data might have skill gaps. In particular, the study identified gaps in skills such as "identifying appropriate sources of data and information to assess the health of a community" and "collecting valid data for use in decision making."²⁶ Others have also noted the importance of training to assure high-quality data collection.¹⁴

¹ Council of State and Territorial Epidemiologists. Driving public health in the fast lane: the urgent need for a 21st century data superhighway. <http://resources.cste.org/data-superhighway/mobile/index.html>. Published September 25, 2019. Accessed October 7, 2019.

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⁵ National Association of County & City Health Officials. National profile of local health departments. http://nacchoprofilestudy.org/wp-content/uploads/2017/10/ProfileReport_Aug2017_final.pdf. Published August 2017.

⁶ Kronstadt J, Chime C, Bhattacharya B, Pettenati N. Accredited health department partnerships to improve health: an analysis of community health assessments and improvement plans. *J Public Health Manag Pract*. 2018;24(suppl 3):S35-S43.

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