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Cezar Brian C. Mamaril

University of Kentucky, cbmamaril@uky.edu

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Evaluating Local Health Department Disease Surveillance and Epidemiologic Investigation

Abstract

A general theme is identified from the papers featured in this *Frontiers of PHSSR* issue by relating it to the evaluation of local health department (LHD) disease surveillance and investigation activities. The discussion focuses on how the studies in this issue contribute to the extant empirical PHSSR literature on disease surveillance and investigation by (1) highlighting the challenges and constraints to LHD preparedness capacity and response; (2) determining the level and variability among LHDs of implementing disease surveillance systems to help address the surveillance input constraints; and (3) considering the various evaluation methods for assessing LHD surveillance and investigation processes and infrastructure.

Keywords

Commentary, local health departments, disease surveillance, disease investigation, preparedness capacity, evaluation methods

Cover Page Footnote

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In 2014, the H1N1 epidemic, followed later in the year by confirmed cases of the Ebola virus disease, drew attention to the country's public health emergency preparedness and response system. Consistent with past epidemics or related public health threats, the response to these events typically brings a renewed focus on the current capacity and ability of the country's disease surveillance and epidemiologic investigation infrastructure. Working collaboratively with a host of federal, state, and local assets, local health departments (LHDs) remain at the front line of the response to public health threats and emergencies. For services most directly associated with emergency preparedness and response, the vast majority of LHDs carry out activities related to disease surveillance and epidemiologic investigation. However, with federal funding for public health preparedness infrastructure steadily declining over time, there is concern over the potential effect that these funding reductions will have on the capacity of LHDs to effectively maintain surveillance and investigation functions.

Two of the papers featured in this *Frontiers of PHSSR* issue focus on LHD preparedness and response as it relates to disease surveillance and investigation. The first paper is by Bevc and colleagues¹ who analyze results from the 2010 and 2012 *Local Health Department Preparedness Capacities Survey* (PCAS). The authors report that LHD preparedness capacity declined significantly, and potentially diminished the ability of LHDs to effectively respond to community preparedness needs, particularly the detection of highly communicable and novel disease events. They further point out how reductions in surveillance system inputs (i.e., data sources), notably for larger LHDs, are compromising LHD access and ability to review and act on data within the broader public health surveillance and investigation system.

The advent and development of electronic disease surveillance systems (EDRS) has helped address much of the health surveillance system input constraints associated with inadequate or poor quality data. Establishing an interoperable EDRS is instrumental to giving LHDs the ability to detect an event and inform response to a potential emergency especially for cases involving highly communicable and novel diseases with high mortality rates, such as Ebola. However, little is known about LHD implementation of EDRS to date. The second paper in this issue by Shah et al.² begins to fill this knowledge gap by examining 2013 survey data from the National Association of County and City Health Officials (NACCHO) on the level of LHD EDRS activity and likelihood of EDRS implementation. The authors indicate that over 70% of LHDs have implemented EDRS, but also find that implementation has been highly variable. To better inform policies to promote LHD adoption of EDRS, future PHSSR studies should investigate the factors affecting EDRS implementation and quality among LHDs.

Even with available measures and indicators of preparedness and response capacity, public health decision-makers face a challenging fiscal environment where public health departments are being asked to do more with less. Funding pressures are expected to be even greater for health departments with larger population jurisdictions, as suggested by the results presented in Orcena and colleagues.³ The authors build on previous research related to Ohio LHD expenditures on core public health services, which include disease and surveillance activities, by incorporating social network analysis (SNA) variables in their regression model. They find that LHD jurisdiction size and LHD network characteristics are significantly associated with LHD expenditure levels. Nevertheless, even if jurisdiction size differences are considered, decisions over funding and expenditure levels are often made concurrently for a multitude of competing

public health priorities within a budgetary framework. Therefore, an economic evaluation of public health department efforts, including preparedness and response activities, is a relevant starting point.

There is an extensive and growing body of literature related to economic evaluation in public health but specific efforts to apply economic evaluation methods in PHSSR to examine LHD response to disease outbreaks are still limited. The paper by Abbas et al.,⁴ which examines LHD response to the 2012 fungal meningitis outbreak in Virginia's New River Valley is a step toward filling this applied research gap. Using a standard approach to estimating cost effectiveness, the authors were able to express the value of LHD response to the disease outbreak in economic terms using disability adjusted life years (DALYs) and incremental cost effectiveness ratio (ICER). As a decision-making aid, these economic measures provide LHDs with an objective and uniform metric to evaluate surveillance and investigation activities within the broader context of the overall LHD services portfolio.

Finally, as a complement to traditional applied economic analyses, LHDs might consider using failure modes and effects analysis (FMEA) to assess their respective public health surveillance and investigation processes. Although the paper by Murphy and colleagues⁵ does not focus on public health surveillance and investigation activities, the authors show how FMEA principles can be applied to a wide range of public health services and programs. When applied to reviewing or assessing LHD surveillance and investigation processes, FMEA is most useful in determining the effect of processes, or modification to a process already in place, or a new process, by identifying potential failure impacts, as well as when and how failures occur, and to prioritize failures for change.

REFERENCES

1. Bevc CA, Davis MV, Schenck AP. Measuring changes in local surveillance and investigation capacity. *Front Public Health Serv Sys Res* 2015;4(4):1–6. DOI: 10.13023/FPHSSR.0404.01.
2. Shah GH, Williams K, Shah BG. Implementation of electronic disease reporting systems by local health departments. *Front Public Health Serv Sys Res* 2015; 4(4):13–20. DOI: 10.13023/FPHSSR.0404.03.
3. Orcena JE, Petros M, Bernet PM. Impact of organizational networks on the cost of core services in Ohio's local health departments. *Front Public Health Serv Sys Res* 2015; 4(4):7–12. DOI: 10.13023/FPHSSR.0404.02.
4. Abbas KM, Dorratohtaj N, O'Dell ML, Bordwine P, Kerkering TM, Redican KJ. Economic evaluation of a fungal meningitis outbreak response in New River Valley: local health department perspective. *Front Public Health Serv Sys Res* 2015; 4(4):21–8. DOI: 10.13023/FPHSSR.0404.04.
5. Murphy JS, Reid M, Ali A, Harrington L, Sandel M. Applying failure mode and effect analysis to public health: the Boston Breathe Easy at Home program. *Front Public Health Serv Sys Res* 2015; 4(4):29–35. DOI: 10.13023/FPHSSR.0404.05.