



# Getting from What to Why: Using Qualitative Methods in Public Health Systems Research

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## Introduction

The 2009 National Health Security Strategy of the United States of America (NHSS) calls for efforts to “collect data on performance measures from real incidents ... analyze performance data to identify gaps, [and] recommend and apply programs to mitigate those gaps.” The Strategy is inspired by the success of similar methods in improving clinical health care; however, learning from real-life public health emergencies poses unique challenges. Given that actual events are unique and that epidemiological facts and contexts vary greatly from one community to another, an assessment of the capability of public health systems’ emergency response gives rise to several complications. Such characteristics mean that real-life events do not lend themselves to replication, a centerpiece of the scientific method.

While routine hospital services may be studied and improved with statistical process and outcome measures, system improvement for rare events requires an in-depth study of individual cases (Berwick et al. 2003). Such rare events include public health emergencies, which are often characterized by uncertainty and require a combination of public health emergency preparedness (PHEP) system capacities. When the focus is on improvement rather than on accountability and on complex PHEP systems rather than on individuals or system components, qualitative assessment of the capabilities of PHEP systems can be more useful than quantitative metrics (Stoto 2013). Qualitative methods can help probe *how* and *why* things happen by exploring how causal mechanisms are triggered in varying

contexts. Thus, qualitative methods can be a useful complement to quantitative approaches, whose strength lies in identifying patterns of variation in and covariation among variables.

Yet, qualitative methods are often subject to justifiable criticism as insufficiently rigorous and transparent. Fortunately, a well-established body of social science methods addresses this criticism. For example, drawing on discussions at an international symposium on health policy and systems research (HPSR), Gilson and colleagues (2011) summarize a series of concrete processes for ensuring rigor in case study and qualitative data collection and analysis (Box 1). With a focus on public health systems rather than individuals, Yin’s (2013) classic book on case study methods, now in its fifth edition, is also relevant. March and colleagues (1991) and Weick and Sutcliffe (2001) offer suggestions specifically relevant to PHEP.

In this brief, we describe ideas presented in a methods panel at AcademyHealth’s PHSR Interest Group Annual Meeting that illustrated three approaches to rigorous qualitative research for examining the performance of public health systems in emergencies. Though the examples all derive from the area of emergency preparedness, the principles of rigorous qualitative study apply to other areas of public health systems research (PHSR). Framed by the realist evaluation perspective (Pawson and Tilley 1997), the three presentations outline different approaches to learning based on the experience of frontline public health professionals involved in the

## Genesis of this Brief:

This brief is drawn, in part, from a panel discussion on using qualitative methods in public health systems research (PHSR) held on June 26, 2012, at AcademyHealth’s 2012 PHSR Interest Group Annual Meeting in Orlando, Florida. The meeting was sponsored by the Robert Wood Johnson Foundation. The panel chair was Leslie Beitsch, M.D., J.D., M.P.H., associate dean of the College of Medicine at Florida State University. Panelists were Michael A. Stoto, Ph.D., professor of health systems administration and population health at Georgetown University; Christopher D. Nelson, Ph.D., M.A., senior political scientist at RAND Corporation; and Tamar Klaiman, Ph.D., M.P.H., assistant professor of health policy and public health at the University of Sciences in Philadelphia.

### **Box 1: Processes for Ensuring Rigor in Case Study and Qualitative Data Collection and Analysis (adapted from Gilson, 2011)**

- *Prolonged engagement with the subject of inquiry.* Even though ethnographers may spend years in the field, health policy and systems research tends to draw on lengthy and perhaps repeated interviews with respondents and/or days and weeks of engagement at a case study site.
- *Use of theory.* Theory is essential to guide sample selection, data collection, analysis, and interpretive analysis.
- *Case selection.* Purposive selection allows earlier theory and initial assumptions to be tested and permits an examination of “average” or unusual experience.
- *Sampling.* It is essential to consider possible factors that might influence the behavior of the people in the sample and ensure that the initial sample draws extensively across people, places, and time. Researchers need to gather views from a wide range of perspectives and respondents and not allow one viewpoint to dominate.
- *Multiple methods.* For each case study site, best practice calls for carrying out two sets of formal interviews with all sampled staff, patients, facility supervisors, and area managers and conducting observations and informal discussions.
- *Triangulation.* Patterns of convergence and divergence may emerge by comparing results with theory in terms of sources of evidence (e.g., across interviewees and between interview and other data), various researchers’ strategies, and methodological approaches.
- *Negative case analysis.* It is advisable to search for evidence that contradicts explanations and theory and then refine the analysis accordingly.
- *Peer debriefing and support.* Other researchers should be involved in a review of findings and reports.
- *Respondent validation.* Respondents should review all findings and reports.
- *Clear report of methods of data collection and analysis (audit trail).* A full record of activities provides others with a complete account of how methods evolved.

2009 H1N1 pandemic. Drawing on the 2009 pandemic, Tamar Klaiman, Ph.D., M.P.H., illustrated a positive deviance approach to learning from local health departments (LHD) that performed beyond expectations in terms of mass vaccination clinics. Again drawing on the 2009 pandemic, Christopher D. Nelson, Ph.D., M.A., used a grounded theory approach to identify insights into managing long-duration, moderate-acuity public health incidents. Drawing on experience in health care and other industries, Michael A. Stoto, Ph.D., described how root-cause analysis can help practitioners learn from singular public health emergencies. Each approach is grounded in unique and rigorous methodological approaches, supported by social science work further described in this paper.

### **Three Approaches to Conducting Rigorous Qualitative Research on Public Health Emergencies**

#### **Positive Deviance**

During the 2009 H1N1 vaccination campaign, many LHDs used public and school-based clinics to administer vaccines, but practices varied widely from community to community. Relying on the principle that excess variability indicates an opportunity for systems

improvement, Klaiman and colleagues (2013) used the vaccination campaign to illustrate how using a positive deviance approach, coupled with process mapping and a realist evaluation perspective, can help identify best practices for future countermeasure mass distribution efforts.

The positive deviance approach is a framework for identifying and learning from top performers—those that consistently perform beyond expectations. To identify the positive deviants, Klaiman and colleagues reviewed various data sources and used a snowball sampling method that called for asking LHD staff to recommend peers who, according to their estimates, performed admirably in the effort to distribute H1N1 vaccine. After reviewing LHD vaccination processes from across the country, Klaiman’s team created process maps to define the major activities carried out by LHDs in public and school-based vaccination clinics. The team aimed to develop an observational grid that identified key activities. Klaiman then conducted in-depth interviews with health department officials in 20 LHDs that played a variety of roles in responding to the pandemic. She relied on a semi-structured interview protocol in which she asked questions about each of the key process domains.

### Box 2: Sample Context + Mechanism = Outcome Stories for Public Vaccination Clinics (adapted from Klaiman 2013)

- *Defining priority groups.* Small local health department + large Orthodox Jewish community + Sunday clinics = Jewish attendance at clinic
- *Communicating with the public.* Reverse 911 system + clinic information = public notification about clinic
- *Staffing.* Small LHD + local health professions students + clinic training added to school curriculum = well-trained clinic staff
- *Community partnerships.* Many local churches + meeting with clergy = coordination with local partners and higher vaccination rate
- *Flexibility.* Small LHD + limited budget + completed registration forms = reimbursement from insurance companies for those vaccinated who were privately insured

Drawing on the interviews, Klaiman and colleagues identified major mechanisms that contributed to LHDs' mass vaccination success, including the formation of partnerships with external agencies, effective communication with partners and the public, staff training and appropriate role assignments, and reliance on a process for feedback and continuous improvement during clinic activities. Going beyond generalities, however, the realist evaluation approach seeks to identify "what works for whom in what circumstances and in what respects" (Pawson 1997). In other words, the challenge for Klaiman and colleagues was to identify how program mechanisms (M) interact with contextual factors (C) to result in positive, negative, or neutral outcomes (O). In this perspective, potential C + M = O stories, or mini-theories, are identified from case studies and then tested in other circumstances. Box 2 summarizes the C + M = O stories identified in the analysis.

For example, Klaiman and colleagues discovered that small, rural LHDs depended on informal relationships with school administrators and nurses while larger, more urban LHDs relied on formal relationships. In a small community, the school nurse may be the neighbor of the local emergency planner. Personal relationships allow for less formality in partnerships. Large, urban LHDs may require formal memoranda of understanding because administrative staff members do not know each other. At the same time, though, formal relationships may solidify partnerships that might not otherwise exist.

Based on Klaiman's analysis and a related analysis of school-based clinics, Klaiman concluded that the combination of a positive deviance approach and process maps allowed her team to engage

with and effectively draw out the experience of public health practitioners in an organized way. Asked about studying negative deviants as well, Klaiman noted the potential value of reports of emergency responses that were less than totally successful. She did, however, point to the challenges of motivating practitioners to speak honestly about these circumstances.

### Grounded Theory

Also deploying a systematic methodology for capturing lessons from public health responses to the 2009 H1N1 pandemic, Nelson and colleagues analyzed the response of the Los Angeles County Department of Public Health (LACDPH) (Lewis, forthcoming). Working in consultation with health department officials representing a variety of administrative departments, disciplines, and levels of seniority, the researchers developed a multiphase, qualitative exploratory approach in the tradition of grounded theory. According to this approach, researchers collect data in the absence of clear hypotheses. They code and categorize patterns in the data, identify the main themes emerging from the data, and then derive or reverse engineer a theory to account for the patterns (Glaser 1977; Charmaz 2006). In Phase I, Nelson and colleagues used a large-sample survey to elicit major themes from a broad group of stakeholders. In Phase II, they conducted focus groups with major organizations involved in the response, concentrating on priority types of perceived challenges identified by the survey and additional issues raised by focus group participants. The focus groups provided an open forum and used diagramming (e.g., fishbone analysis, process flows) to elicit root causes and potential corrective actions. In Phase III, Nelson and colleagues conducted interviews with leaders that focused on the priorities identified earlier and additional issues raised by the interviewees. Finally, in Phase IV, they summarized the findings of the review for presentation to LACDPH executive leaders in the form of a change conference.

Nelson and colleagues found that the public health response to the H1N1 outbreak illustrated the challenges of mounting an unplanned but long-term, large-scale response while simultaneously maintaining most routine functions. Even though the challenges are wide-ranging, they all stem from the need to work concurrently within two organizational structures: the routine structure for daily department operations and the emergency structure prescribed by the Incident Command System (ICS) and used by all first responder organizations from fire to police to, more recently, public health agencies. The general challenges encountered by Nelson and colleagues related to division of labor, channels of input in decision-making, workload, and the timeliness and execution of decisions. The analysis led to several recommendations for addressing the challenges such as identifying escalating Continuity of Operation Plans (COOP) with clear triggers for balancing emergency and routine operations, coaching on the ICS and crisis decision-making, creating a rapid process-improvement cell, and creating regular opportunities to practice crisis decision-making.

Based on their analysis, Nelson and colleagues concluded that a multiphase, multi-method case study approach can succeed in drawing important and actionable lessons from a single case, in this instance, the response of a single health department to a single incident. More generally, the analysis implies that enhanced efforts to learn systematically from single cases can provide important insights into the structure, operations, and outcomes of public health systems.

### Root-Cause Analysis

To complement the Massachusetts Department of Public Health's 2009 H1N1 After-Action Report, Higdon and Stoto (2013) conducted an in-depth case study of the public health response to the H1N1 pandemic on Martha's Vineyard, an island of 16,000 residents in Massachusetts. The case study drew from a review of local newspapers and interviews with key stakeholders, including health and school officials and representatives of the island's only hospital. It illustrates how in-depth root-cause analysis (RCA) can be used to learn from single events.

The goal of RCA is to move from superficial, proximate causes to system-level root causes by repeatedly asking *why* each identified cause occurred (Crouteau 2010). Stoto and colleagues, working with the Harvard School of Public Health's Preparedness and Emergency Response Research Center (PERRC), have been developing and testing a rigorous and practical approach for use by public health departments to analyze critical incidents and drive

organizational learning within and across PHEP systems. Piltch-Loeb and colleagues (2013) have identified a five-step approach (Box 3) for conducting an RCA of public health emergency responses.

Applying this approach to the Vineyard in the fall of 2009, the primary objective was to vaccinate the public in an efficient and organized manner such that high priority groups are vaccinated first and the rest of the public is covered as much as possible. The Martha's Vineyard public health "system" is highly decentralized. Its six town health departments registered as a single entity to receive vaccine supplies from the state but registered separately from the island's only hospital, one pediatrician, and the Wampanoag Indian tribe. An informal Martha's Vineyard public health coalition (MVPHC), representing the towns and the tribe but not the hospital or other providers, planned a single island-wide vaccine clinic. When vaccine deliveries were delayed and arrived in small units, the MVPHC switched to a school-based vaccination strategy in which "shooter-teams" vaccinated the children in each school depending on the number and type of vaccine deliveries. The hospital was not aware of the change in plans and made inconsistent assumptions about which organization would provide vaccine for vulnerable populations other than school children. The result was confusion.

The RCA (Figure 1) suggests the following lessons from the Martha's Vineyard experience:

- Local implementation of the vaccination campaign should have been flexible, allowing for the sharing of personnel and resources across towns in order to constitute shooter teams.
- State officials should recognize the existence of regional coalitions before emergencies arise.
- Hospitals and other providers should be more fully involved with the MVPHC.

### Qualitative Rigor and PHSR

The three analyses described above illustrate different approaches to and demonstrate the relevance of using qualitative research methods in PHSR. Indeed, the important processes for ensuring rigor in qualitative data collection and analysis identified by Gilson and colleagues and illustrated in Box 1 apply equally to health services research's sister discipline, PHSR.

### Use of Theory

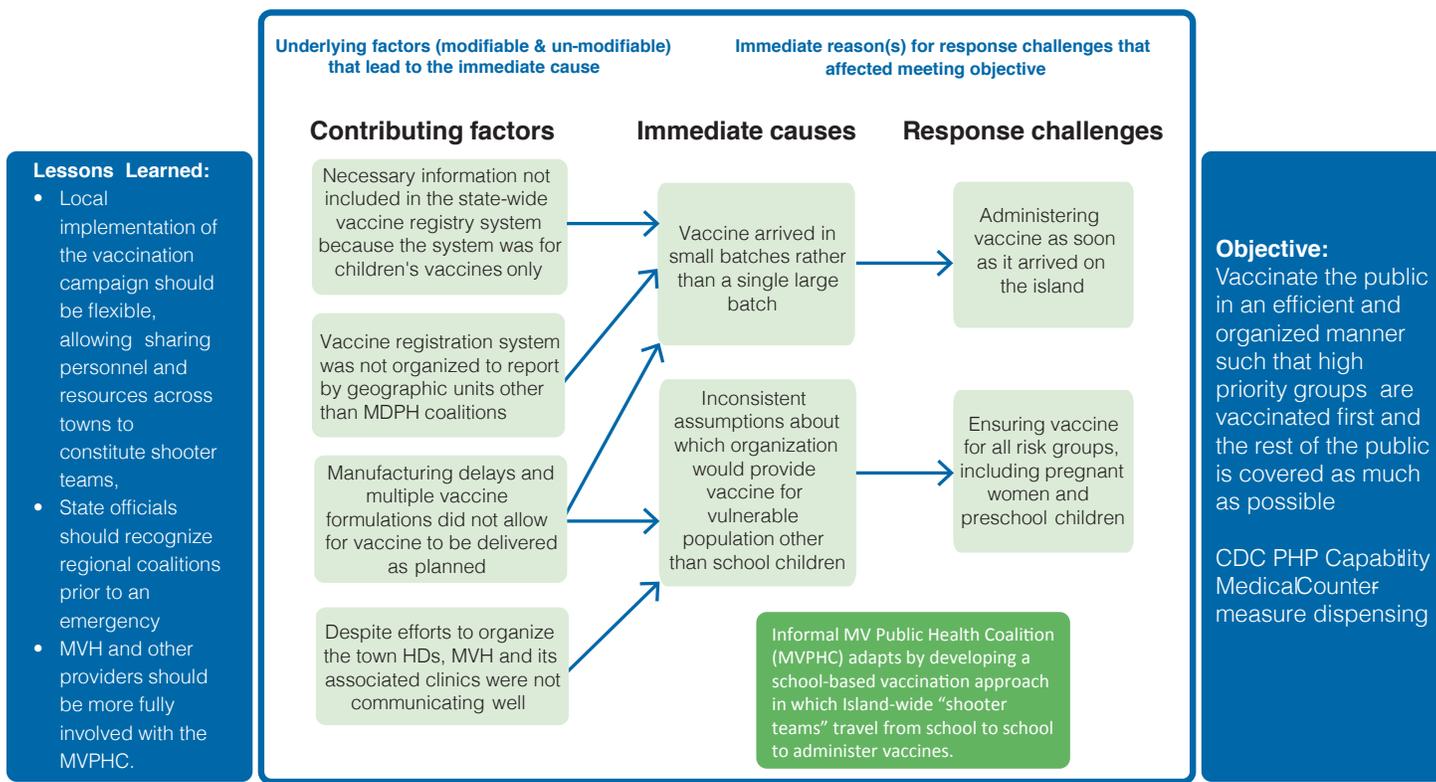
The three analyses draw on a family of theory-oriented evaluation methods that use program theory to guide questions and data gathering and focus on explicating the theories or models that underlie programs, elaborating causal chains and mechanisms, and conceptualizing the social processes implicated in the

### Box 3: Conducting a Public Health Emergency Response RCA (adapted from Piltch-Loeb and colleagues (2013))

1. Define the story arc by summarizing the context and pivotal nodes (events, decisions, time points) when events could have unfolded differently and could have led to a substantially different outcome.
2. Identify the public health system's major organizational goals or objectives in responding to the incident, including which Public Health Preparedness Capabilities (Centers for Disease Control and Prevention 2011) were stressed.
3. Identify the major response challenges that had a qualitative impact on permitting achievement of the public health system's goals or at least had the potential to do so.
4. Define the immediate causes of the challenges and the factors that contributed to the challenges, whether modifiable (within the jurisdiction's influence) or not modifiable (not within the jurisdiction's influence); note pre-event decisions and factors beyond the system's control.
5. Identify factors that, if not addressed, are likely to limit the public health system in future incidents.

**Figure 1: Root-Cause Analysis of the Martha’s Vineyard Response to 2009 H1N1**

Story Arc: Martha’s Vineyard Towns register to receive vaccine independently of the Martha’s Vineyard Hospital and physician’s offices. Planned island-wide clinic postponed twice due to delays in vaccine delivery. Informal MV public health coalition organizes shooter teams to implement school-based vaccination strategy.



Note that in this graphical representation of a RCA, causality goes from left to right, although the analysis is done from right to left, beginning with the objective, moving through response challenges, immediate causes, and contributing factors. For more details, see Piltch-Loeb et al., 2013.

program’s outcomes (Dixon-Woods 2011). Klaiman and colleagues turned to one well-known member of this family of theory-oriented evaluation methods—realist evaluation. Developed by Pawson and Tilley (1997) and introduced to HSR by Berwick (2008), realist evaluation places the focus of research and evaluation less on relationships among variables and more on an exploration of the causal mechanisms that generate outcomes. The approach also recognizes that mechanisms that succeed in one context may not succeed in others. Furthermore, in what Pawson and Tilley call generative causality, realism is premised on the view that causality in the social world operates through the perceptions, incentives, capacities, and perspectives of the individuals involved in the system of interest. Pawson and Tilley argue that learning about causality requires direct observation of causal mechanisms. In contrast, the successionist view holds that causality is more akin to an external force introduced by programs and intervention and that learning about causality is a matter of consistent patterns in relationships among variables (e.g., X consistently precedes Y). The approaches differ in two ways: their basic understanding of the nature of causality in the social world (i.e., ontology) and what such an understanding implies about how one learns about causality (i.e., epistemology).

While realism is compatible with both qualitative and quantitative methods, qualitative methods are often required for observing casual mechanisms.

**Case Selection**

The theory-based approach has implications for practical issues of research design. Gilson and colleagues (2011) recommend the use of theory to guide sample selection, data collection, and data analysis and to draw into interpretive analysis. Theory in this context applies broadly, ranging from basic social science theories about risk communication to preparedness doctrine as embodied in the National Incident Management Strategy (NIMS), the NHSS, or the Centers for Disease Control and Prevention’s (CDC) Public Health Preparedness Capabilities (CDC 2011). Nelson’s Los Angeles case, for instance, examines how emergency response doctrine, as represented in the NIMS, fared in the 2009 pandemic.

On the other hand, case studies may be useful for developing and testing new theories. Lewis and colleagues’ (forthcoming) analysis of the Los Angeles County Department of Public Health’s response to the 2009 H1N1 pandemic demonstrates the grounded theory approach. In another example, Klaiman and colleagues’ use of a

realist evaluation approach identified “what works for whom in what circumstances and in what respects.”

Gilson and colleagues also recommend a purposive—rather than random—approach to selecting cases in order to allow for the testing of earlier theory and initial assumptions or the examination of both ‘average’ and unusual experience. The positive deviance approach used by Klaiman and colleagues (2013) is an example of a purposive approach. Purposive sampling may also be useful in conducting a series of parallel case studies, with cases intentionally selected to reflect a variety of settings such as health department types, geographic areas, and populations served while testing theories about the determinants of effective PHEP systems (Yin 2009). Higdon and Stoto’s Martha’s Vineyard case study (2013), for instance, was nested in the Massachusetts Department of Public Health 2009 H1N1 After-Action Report, which may be compared to a parallel case study of Italy’s Emilia Romagna region (Savoia, forthcoming). The approach in the Martha’s Vineyard study is reflected in all three analyses, which represent parallel analyses of different aspects of the public health system response to the 2009 H1N1 pandemic.

It is often said, “If you’ve seen one health department . . . you’ve seen one health department.” Despite considerable diversity, emerging typologies (Mays 2010) can help researchers identify groups of similar departments from which to choose research samples.

Finally, Gilson and colleagues (2011) recommend negative case analysis, that is, the search for evidence that contradicts current explanations and theory and the subsequent refinement of theory in response to such evidence. Critical incident analyses of responses that were less than 100 percent successful are one such example, along with the studies of negative and positive deviants.

### Sampling within Cases

Gilson and colleagues (2011) recommend consideration of as many factors as possible that might influence the behavior of the people in a sample. In addition, they note that an initial sample should draw extensively across people, places, and time and incorporate the views of a wide range of respondents such that one viewpoint does not dominate. In addition, particularly when dealing with single, unique cases, March and colleagues (1991) stress the need for several observers in order to increase the number of interpretations, thereby creating a mosaic of conflicting lessons. In particular, Weick and Sutcliffe recommend that researchers resist the temptation to normalize unexpected events. In the face of system failure, they argue, it is natural to look for evidence that confirms expectations, effectively postponing the realization of unexpected developments. Rather, experience that questions planning assumptions often does more to support organizational learning and improvement than experience that confirms such assumptions (Weick 2001).

To learn as much as possible from single, unique cases, March and colleagues (1991) recommend gathering as much information as possible on the preferences and values used by organizations to distinguish successes from failures. This approach is evident in the Los Angeles example; Lewis and colleagues used a grounded theory case study approach organized around formal surveys of a broad group of stakeholders, along with focus groups with key organizations involved in the response, to identify insights into managing long-duration, moderate-acuity public health incidents. The in-depth case study of Martha’s Vineyard (Higdon 2013) is another example of the same approach. Klaiman and colleagues (2013) used the identical approach; they interviewed health department officials serving in a variety of roles, ensuring coverage of each of the key process domains.

### Multiple Methods

Gilson and colleagues (2011) recommend the use of several research methods within case studies. Lewis and colleagues (forthcoming) followed such an approach when they conducted a large sample survey, focus groups with key organizations, interviews with individual leaders, and a change conference to analyze the LACDPH’s response to the 2009 H1N1 pandemic.

### Triangulation

Gilson and colleagues (2011) and Yin (2009) suggest looking for patterns of convergence and divergence by comparing results with theory across several sources of evidence (e.g., across interviewees and between interviews and other data), between researchers, and across methodological approaches. For instance, in other work from the Harvard PERRC, Stoto and colleagues (Zhang 2011; Stoto 2012) compare several data sources to identify a consistent pattern of biases in 2009 H1N1 surveillance data. This approach helps address the lack of a gold standard and describes actual trends in the rate of H1N1 infection and its consequences over time.

### Prolonged Engagement with the Subject of Inquiry, Respondent Validation, and Peer Debriefing

As described by Gilson and colleagues, health policy and systems research tends to draw on lengthy and perhaps repeated interviews with respondents and/or days and weeks of engagement within a case study site (Gilson 2011). Pawson and Tilley (1997) make a similar point about evaluations in the realist perspective and describe an approach to practitioner interviews in which evaluators ask practitioners to support or refute present preliminary results. Along similar lines, Davis and colleagues describe how principles of community-based participatory research may be applied to PHSR by, for example, identifying research questions, creating practical yet rigorous studies, and ensuring that results are disseminated to participants and interested parties. They also provide examples that demonstrate how established partners can join forces to address a specific need such as the response to H1N1 (Davis 2012).

Rather than the arm's length relationship with research subjects that some evaluation experts maintain, the prolonged engagement with subjects incorporates reviews of preliminary findings and reports by PHEP practitioners whose systems are undergoing evaluation. This approach produces potentially more actionable findings in that practitioners are invested in the evaluation process (Patton 2008). A review of findings and reports by other researchers is also critical, as exemplified by the Los Angeles and Martha's Vineyard analyses.

### Clear Report of Methods of Data Collection and Analysis (audit trail)

Gilson and colleagues note the importance of maintaining a full record of data collection and analysis activities and presenting to the research community a full account of how methods evolved (Gilson 2011). Especially amid a public health emergency, it is often difficult when dealing with protracted events in real time to document activities and provide updates on method and developments. Debriefing participants "within the hour" as Weick and Sutcliffe advocate (Weick 2001) can be difficult and impractical during public health emergencies; however, the principle of recording the facts in real time and then performing the analysis later is important. Klaiman, for instance, used a semi-structured interview protocol to ensure that each LHD addressed key process domains. She conducted all of the interviews herself, with a research assistant taking notes during each interview. The assistant compiled and typed the notes within 24 hours of each call.

### Conclusions

In instances of conducting research on complex public systems rather than on agencies or individuals, qualitative methods may be more informative than quantitative approaches. Applying methods that have been developed in the social sciences and evaluation literature may enhance the rigor of such approaches. Though not always considered the gold standard, qualitative analyses identify *how* and *why* causal mechanisms are triggered, allowing for a more thorough description of public health emergencies and perhaps yielding more detailed lessons for the future.

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