POLICY MAKING TO BUILD RELATIONSHIPS: A GROUNDED THEORY ANALYSIS OF INTERVIEWS AND DOCUMENTS RELATING TO H1N1, EBOLA, AND THE U.S. PUBLIC HEALTH PREPAREDNESS NETWORK

NATHAN MYERS
Indiana State University

ABSTRACT

In the last five years, the American public health emergency preparedness and response system has been tested by two significant threats, H1N1 and Ebola. While neither proved as dangerous as initially feared, these viruses highlighted on-going issues with collaborations in the field of public health and health care. Strengths were identified within the network, but also challenges that must be resolved before the U.S. faces a major pandemic. Employing interview data from public health emergency response practitioners and documentary evidence from the H1N1 and Ebola responses, this qualitative analysis uses the grounded theory approach to identify key areas for collaborative improvement. The grounded theory developed calls for a stronger policy framework at the federal level to facilitate more collaboration between U.S. agencies and facilitate more collaboration at the state and local level.

INTRODUCTION

Between 2009 and 2015, the American public health and health care systems have seen the emergence of two potentially serious challenges, H1N1 influenza and the Ebola virus. The response to these two different but serious health threats highlighted the importance of collaboration and coordination between different levels of government in the U.S., as well as between government and partners in the private and non-profit sector. However, the responses also demonstrated that these collaborations will need to be

strengthened in preparation for a more virulent and widespread emergency. This grounded theory qualitative study examines data derived from interviews, government and non-profit organization reports, news accounts, budgetary requests, congressional testimony, and policy documents to examine strengths and challenges in the area of public health emergency preparedness and response and identify key areas for improvement. This is an important field of inquiry as many public health and medical experts believe that the U.S. will eventually have to confront a pandemic of significant magnitude (see Morens, Taubenberger, and Fauci, 2013).

This study will begin with a review of the literature regarding collaboration, in particular collaboration in public health emergency preparedness. This will be followed by a description of the data collection process, which involved interviews and documentary research. The process of grounded theory qualitative analysis will then be described, including the open coding of information, formation of core categories, and development of grounded theory. Finally, the core categories and grounded theory will be discussed in light of the existing literature to discuss how the findings bolster existing knowledge and suggest new approaches to building more collaborative capacity.

LITERATURE REVIEW

Collaboration between levels of government and between government agencies and other public, non-profit, and/or private entities has been a subject of extensive study in the public administration and public health literature. Agranoff and McGuire (2003, 4) define collaborative management as "the process of facilitating and operating in multi-organizational arrangements to solve problems that cannot be solved, or solved easily, by single organizations" (as cited in Kiefer and Montjoy, 2006). Thomson and Perry

(2006) write that collaboration "occurs as organizations interact formally and informally through repetitive sequences of negotiation, development of commitments, and execution of commitments" (p. 21). Bryson, Crosby, and Stone (2006) suggest that collaboration can be viewed as an acceptance that we live in a world where power must be shared and that any single government or organization will only enjoy so much success acting alone.

Logsdon (1991) writes that collaboration emerges from recognized self-interest and acknowledged interdependence. The failure of one sector (public, private, or non-profit) to successfully solve a problem is viewed as a necessary precondition for the creation of a collaboration. In fact, the goal of a collaborative organization should be to create a public value which cannot be provided by one sector (Moore, 1995, as cited by Bryson, Crosby, and Stone, 2006). The public health emergency response literature offers many examples of collaboration to improve capacity. Rosselli et al. (2010) investigated the North Carolina Division of Public Health partnering with the North Carolina Center for Public Health Preparedness to assist 85 local health departments in developing pandemic influenza plans. One outcome of this was many of the local health departments creating new multi-agency planning groups to develop a structured process for response planning, as well as creating connections with local agencies, such as social service organizations, to assist vulnerable populations.

Beitsch et al. (2006) found that many state preparedness programs adopted a regional structure that encompassed many local agencies and aligned with existing public health, homeland security, and emergency management regions. More work needs to be done to encourage collaboration between public health agencies and health care systems in regard to emergency preparedness (Markiewicz et al., 2012). Lurie et al. (2013)

proposed employing a diversity of research networks to conduct research during an emergency in order to develop new knowledge with which to improve practice. Such networks would be overseen by a scientific research incident commander to coordinate the work. Gebbie, et al. (2008) proposed more collaboration between practitioners and academics to further understanding of public health legal competencies, as well as including the competencies in law enforcement and judicial training programs and creating communities of practice, both vertically and horizontally, to develop specific practices for specific communities and events.

Gray (1996) found that one factor which frequently generates conflict within collaborative organizations is control over resources and, on the other hand, a number of scholars have cited resource availability as a key factor in collaboration success (Provan and Milward, 1995; Rainey and Busson, 2001, as cited in Kiefer and Montjoy, 2006). Research has shown that local health departments support cooperative agreements because they benefit in terms of workforce (Beitsch et al., 2006). Personnel are a key resource to any successful response, making it important for a collaborative effort to manage risk to and provide protections for personnel involved in the effort (Scanlon, 2004; Upshur et al, 2007 as cited in French and Raymond, 2009). While the willingness to respond to a pandemic emergency regardless of severity among public health employees is variable (9-27%), it is theorized that a worker who sees a threat as legitimate and believes they are well equipped to address it will give high priority to recovery efforts (Barnett et al., 2012). The literature highlights the importance of providing training and exercise opportunities to public health personnel (Khan et al., 2015), as well as providing support early on for the immediate families of first responders so that they do not feel as if they are choosing between their families and the larger population

(Barrett and Brown, 2008). Personnel can be vital in building bridges and improving communication between different institutions, as North Carolina demonstrated with their program to place public health epidemiologists into hospitals (Markiewicz et al., 2012). Even as the federal government seeks to recruit more specialized personnel to conduct research during an emergency (Lurie et al., 2013), 46,000 state and local public health positions have been cut since 2008, presenting 21% of the public health workforce (Walsh et al., 2015).

Direct funding and financial incentive programs have long been used as carrots to promote collaborative partnerships in emergency management (Waugh, 2002, as cited in Waugh and Streib, 2006), and were valuable assets in the response to H1N1. Funding has been identified as a strong motivator for participation in emergency planning and response activities (Harris and Mueller, 2013). Loss of funding at the local level and the accompanying job losses have led to diminished performance in areas like surveillance, investigation, and legal preparedness (Davis, Bevc, and Schenk, 2014). Previous research suggests that scenario-based federal funding affects willingness to respond among local public health personnel. In one study, personnel expressed more willingness and efficacy to respond to bioterrorism or influenza than a radiological attack, possibly because more funding is available to train for such incidents (Barnett et al., 2012). A Congressional Research Service report indicated that hospital preparedness funding has decreased from $940 million in Fiscal Year 2002 to $663 million in Fiscal Year 2014 (Lister, 2014). Even when funds are made available, allocation of those funds may prove difficult. Yeager, Hurst, and Menachemi (2015), in a study of allocation of PHER funding during H1N1, found that purchasing barriers and other administrative barriers such as fund transfer issues hindered the allocation of H1N1 funds.

Coordination of resources, whether of personnel, funding, or items such as medical countermeasures, requires coordination of policy. Courtney, Sherman, and Penn (2013) noted the value of policy tools such as new drug applications and emergency use authorizations in place prior to an emergency to speed the development and use of new medical countermeasures during a response. They further point to the potential usefulness of other pre-event policies, such as emergency guidance and allowing certain products to be held beyond the due date. At the state level, public health emergency declarations can be valuable in providing greater flexibility and guidance to responders. However, to be effective it must be clear as to who has the authority to issue the declaration and the public health law infrastructure must be functional.

Public health preparedness capabilities associated with Public Health Emergency Response (PHER) grant funding is another policy area that may benefit from improved coordination. Griffith, Carpender, Artzberger Crouch, & Quiram (2014) found that health service regions in the State of Texas needed additional tools to link mitigation strategies to grant capabilities. In their study, Jacobson, Wasserman, Botoseneanu, and Wu (2012) found that state and local officials were concerned by the lack of coordination among federal preparedness programs which tended to lead to ambiguous and possibly conflicting guidance. States have shown some success aligning emergency preparedness regions with regions associated with homeland security, trauma and emergency management to improve communication. Improvements in integration and communication have also be seen in aligning Centers for Disease Control and Prevention (CDC) and Health Resources and Services Administration (HRSA) grants (Beitsch et al., 2006). Some have advanced the idea of linking preparedness with public health accreditation as a way of promoting capacity (Kun et al. 2014).

Another issue that can complicate an effective public health emergency response is lack of a clear understanding of the law governing the response. In interviews, Jacobson, Wasserman, Botoseneanu, and Wu (2012) found that most practitioners relied on their own understanding of the law, rather than consulting an objective reference. Bernstein (2013) outlined the four core elements of public health legal preparedness: laws and legal authorities, competency in using the law wisely, coordination of legally-based interventions across jurisdictions, and information on public health laws and best practices. Gebbie et al. (2008) recommended incorporating public health legal competencies into the curricula of health provider and legal professional education programs.

Ospina and Saz-Carranza (2010) emphasized the importance of having unity of mission in collaborations without sacrificing the diverse perspectives, knowledge, and tools which the different organizations can contribute. The literature on collaborative governance suggests that successful leadership of such organizations requires skill as a boundary spanner (Thompson, 1967), which involves managing the use of information and resources across organizational boundaries. The importance of effective communication and information management is evident in the public health emergency preparedness and response literature. Gibson, Theadore, and Jellison (2012) noted the importance of a comprehensive framework for responding to pandemic influenza, which should include daily meetings to share information and consult on planning and the management of resources. Surveillance information like emergency department use and lab results also need to be appropriately disseminated, while trends in the general population are monitored. Public information efforts need to be implemented to educate the public about risks and

alert emergency personnel to changes in recommendations for treatment (Gibson, Theadore, and Jellison, 2012).

Kun et al. (2014) highlights the importance of having a clear messaging strategy and engaging communities meaningfully through training, exercises, and planning for recovery. Due to budget cuts and job losses, local health department capacity for surveillance and investigation has diminished (Davis, Bevc, and Schenk, 2014). Markiewicz, et al. (2012) found evidence to suggest improvement in communication between public health agencies and hospitals created by placing public health epidemiologists in the hospitals.

In a study of literature regarding communication with the public during H1N1, Lin, Saviola, Agboola, and Kasiomayajula (2014) found that adoption of infection prevention practices was affected by factors that included the public's trust in the source of information and individuals' information-seeking behaviors. They recommended targeting information at the young, less educated, and the indigent as they are likely to lack awareness. Non-traditional communication channels should be used to reach out to these groups, and officials should be conscious of the literacy level of messages. They also called upon the media to provide a consistent flow of information to counter misinformation (Lin, Saviola, Agboola, and Kasiomayajula, 2014). Communication and education were among the cross-cutting themes Khan et al. (2015) noted in the PHER literature, along with surveillance and public health information. Issues like trust and message preference have been explored, but more research needs to be done in regard to emerging technologies (Khan et al. 2015). French (2011) suggested that engagement and transparency on the part of public health officials toward the public is helpful for assuring citizens that government's decisions during a pandemic response were made out of ethical concern for individual

rights and public safety. In his view, transparency and engagement would facilitate better understanding and implementation of response measures.

The literature lays out a number of factors that can strengthen or challenge a collaborative public health emergency response. The remainder of the study will be spent qualitatively analyzing evidence from practitioner interviews and documentary evidence from the H1N1 and Ebola responses to develop a grounded theory regarding public health emergency response to support and expand the existing knowledge.

DATA

The qualitative data for this project is drawn from a combination of interviews with professionals in the State of Indiana actively involved in public health emergency response and a range of documentary evidence regarding the responses to H1N1 and Ebola in the U.S. Six interviews involving seven public health preparedness professionals were conducted by phone between January 30, 2014 and July 10, 2014. The interview participants included three employees of Indiana hospitals, an employee of a local public health department, a county emergency manager, a former leader of a hospital preparedness coalition and hospital executive, and a business manager for a hospital preparedness coalition. Documentary evidence was drawn from H1N1 after-action reports from state, local, tribal, or national public health organizations. These reports were either obtained through on-line searches or by contacting the organization and obtaining it directly. The reports represent a mix of public health perspectives from different levels of government, as a well as a geographic mix within the U.S. Other evidence associated with the H1N1 response and included with the data was the National Response Framework, which was used as a governing document for

the H1N1 response, the Fiscal Year 2011 budget request for the CDC which was made in the wake of the H1N1 response, and Secretary Kathleen Sebelius' testimony before the U.S. Senate Committee on Homeland Security and Government Affairs regarding the federal response to the virus.

Evidence regarding the U.S. response to the Ebola virus included contemporaneous news accounts of the federal, state, and local responses to the infections in the U.S. in *The McClatchy Tribune, The Washington Post,* and *The Los Angeles Times.* Articles were located using the Lexis-Nexis Academic database and searching for news articles including the key terms "CDC," "Ebola," and "Dallas" to identify articles focusing on the response to Ebola in the U.S. Of the newspapers identified, *The Washington Post* (58 articles collected) and *The Los Angeles Times* (47 articles collected) were chosen based on their level of coverage of the event, the national scope of their coverage, and their different geographic orientation. *The McClatchy Tribune* was selected as a national publication that offered significant focus on response at the local level.

Other documentary evidence associated with the Ebola response in the U.S. was eight CDC *Mortality and Morbidity Weekly Reports* addressing the U.S. response to Ebola in its borders, the Fiscal Year 2016 CDC budget request made in the wake of the federal Ebola response, and the testimony of HHS Secretary Sylvia Matthews Burwell to the U.S. Senate Committee on Appropriations regarding the national response. In addition to documents pertaining especially to H1N1 and Ebola, summaries of the Pandemic All-Hazards Preparedness Act of 2006 and 2013 were reviewed as well. The data sources are summarized in Table 1.

Table 1

Summary of Qualitative Data Sources

Primary Data Sources

Interviews with Indiana Public Health Preparedness Personnel

Hospital Preparedness Representative (January 30, 2014), Local Public Health Representative (March 4, 2014), Former Hospital Preparedness Representative and Hospital Executive (June 3, 2014),
Two Hospital Employees Involved with Emergency Preparedness (June 4, 2014),
County Emergency Management Agency Director (June 20, 2014),
Hospital Preparedness Coalition Business Manager (July 10, 2014)

Federal, State, Local and Tribal Government After-Action Reports

Association of State and Territorial Health Officials (June 2010)
Billings Area Health Services Area (Montana/Wyoming) (November 2010)
Coalition for Local Public Health (Massachusetts) (October, 2010)
Florida Department of Health (July 30, 2010)
Iowa Department of Public Health (No Date Provided)
New Hampshire Dept. of Health and Human Services and Dept. of Safety (July 31, 2010)
Northern Illinois Public Health Consortium (Winter 2011)
Oregon Department of Human Services: Public Health Division (No Date Provided)
Seattle and King County Public Health (August 1, 2010)
U.S. Department of Health and Human Services (June 15, 2012)
Texas Department of State Health Services (August 30, 2010)

Addition Data Sources

CDC Federal Budget Requests for FY2011 and FY2016
CDC *Morbidity and Mortality Weekly Reports*: October 17, 2014; November 21, 2014; December 12, 2014; January 30, 2015; February 13, 2015; March 6, 2015; April 3, 2015; April 10, 2015
Library of Congress Summaries of the Pandemic and All Hazards Preparedness Act of 2006 and 2013
The National Response Framework for 2009-H1N1 Influenza Preparedness and Response

Table 1, continued
Newspaper Articles Covering the U.S. Ebola Response
Retrieved from Lexis-Nexis Academic from the following publication: *McClatchy Tribune*, *Washington Post*, *Los Angeles Times*
Testimony of Health and Human Services Secretary Kathleen Sebelius before the Senate Committee on Homeland Security and Government Affairs, Oct. 21, 2009
Testimony of Health and Human Services Secretary Sylvia M. Burwell before the Senate Committee on Appropriations, Nov. 12, 2014

This interview data and documentary evidence was selected in an attempt to gather a full range of perspectives on public health emergency preparedness and the variety of aspects involved. An attempt was also made to find an appropriate balance between evidence regarding the H1N1 and Ebola responses. Reviewing documents like the National Response Framework and the federal legislation helped to provide a wider view of how pandemic preparedness is approached at the national level. Finally, an attempt was made to reach a point of theoretical saturation of data (Saumure and Given, 2008, as cited in Marshall and Rossman, 2016) through the use of multiple data sources. In the next section, the methods involved will be reviewed.

METHODS

Interviews were conducted by phone using a semi-structured interviewing technique wherein a particular set of predetermined questions were used, but the interview allowed for follow-up or clarification questions. Semi-structured interviewing approaches employ "pre-determined questions, improvised improvisational probes, and responsible follow-up questions" (Luton 2010, p. 23). Questions are not treated as a "binding contract" (Glesne 2006, p. 79). Interview questions are the tools used to gain information with which to answer research questions. Questions should be derived from theory (Glesne 2006). In

this case, questions came from the public administration and public health literature on collaboration.

The interview process was in keeping with Marshall and Rossman's (2006) perspective on qualitative in-depth interviews, in that they introduced topics that allowed the participants the freedom to structure their own response and convey the value of the participants' points of view. However, it is also important to be mindful of Luton's (2010) admonition that an interviewer must exert control in an interview situation to gain greater understanding of the problem under discussion. Also as suggested by Luton, an interview guide was employed for this purpose. It is important to keep in mind that the researcher is not just pursuing knowledge, but understanding as well (Luton 2010, p. 22).

There are, of course, strengths associated with the in-depth interviewing approach (collecting a large amounts of data efficiently) as well as weaknesses (participants may feel uncomfortable sharing information or may lack a certain degree of awareness). The primary purpose of the research was to solicit the participants' subjective views on the issues, although where possible the primary researcher attempted to confirm facts using publicly available documents. This research may also be seen as falling under the category of elite interviewing, as all participants were selected based on their depth of experience with the subject matter (Marshall and Rossman, 2006). Interview participants should be selected based on their depth of knowledge and willingness to share knowledge, and the interview process should be approached as a partnership (Luton, 2010).

This research utilized the grounded theory approach as described by Glaser and Strauss (1967) and summarized in Figure 1.

Figure 1
Stages in Grounded Theory Research
Stage 1: Identify a topic of interest and select the grounded theory research approach
Stage 2: Determine purpose(s) for the research
Stage 3: Select a group or sample to study
Stage 4: Collect data
Stage 5: Open (preliminary) coding of data as it is collected
Stage 6: Theoretical coding for theory development
Stage 7: Develop theory
(McNabb 2008)

After the transcription was complete, the primary investigator used open coding of sentences or paragraphs within the transcripts to identify key concepts emerging from the data and linking them together under themes. During the process, the investigator assigns the themes that emerge from the data to broader categories, called core categories, which highlight the relationships between the themes (Lee, 1999). These core categories are then used to create broader categories in order to facilitate theory development (Lee, 1999). Table 2 provides the themes that emerged from open coding of the interview transcripts:

Table 2
Themes Derived from Open Coding of Interview Transcripts

Theme	Definition
Collaboration	Information relating to public health/health care agencies working with public, non-profit, or private entities on preparedness/response activities
Resources	Information relating to funding, material, or personnel used or needed for preparedness/response activities
Communication	Information relating to efforts to convey information to preparedness/response partners or to the public
Logistics	Information related to performance of actions during a public health response, such as delivering vaccine or sharing protective equipment
Involvement of First Responders	Information related to the involvement of first responder agencies, such as police and fire departments, in public health preparedness and response activities
Internal Management	Information related to the governance of organizations or groups of organizations involved in public health preparedness and response collaboration

The next step in the process involved open coding of the H1N1 after-action reports from the state, local, and tribal health departments. Sentences were again the unit of measurement, although complete paragraphs were coded if the entire paragraph was addressing the same subject matter. The open coding of those documents produced the themes in Table 3, some of which coincided with themes from the interviews:

Table 3
Themes Derived from Open Coding of H1N1 After-Action Reports

Theme	Definition
Logistics*	Information related to performance of actions during a public health response, such as delivering vaccine or transporting and disposing of medical waste
Collaboration*	Information relating to public health/health care agencies forming groups with public, non-profit, or private entities for preparedness/response activities
Coordination	Information relating to public health/health care agencies working together to accomplish different actions related to public health preparedness and response.
Communication*	Information relating to efforts to convey guidance to preparedness/response partners or educational information to the public
Information Management	Information related to the sharing of key data between response partners, including biosurveillance data and data regarding the distribution of vaccine
Resources	General references to material needed for public health preparedness and response
Funding	More specific references to money necessary for public health preparedness and response
Personnel	More specific references to human resources necessary for public health preparedness and response
Policy	Information related to government directives and guidance for public health preparedness and response
Relationship Building	Information related to actions undertaken in order to strengthen connections between collaborative organizations prior to a public health response
Planning	Information related to planning activities prior to a public health response
Preparedness	Information related to preparedness activities prior to a public health response, such as exercises or testing equipment

*=Those themes with asterisks also emerged from open coding of the interview transcripts

After completion of the open coding of both sets of data, segments from the documents associated with the codes were separated out and put into their own document. This document was then loaded into the qualitative analysis program QDA Miner, Version 3, developed by Provalis Research. The codes associated with the open coding for both sets of data were entered into the project and organized into the following themes:

Table 4
Open Codes Organized by Themes

Implementation	*Intelligence*
Logistics	Communication
Resources	Information Management
Resources-Personnel	
Resources-Funding	*Governance*
	Policy
Network	Planning
Collaboration	Preparedness
Coordination	
Relationship Building	
Involvement of First Responders	

The appropriate codes were then applied to the interview transcript segments and the segments from the after-action reports in QDA Miner. It should be noted that multiple codes could be applied to multiple sentences within the data. After this work was completed, the additional qualitative documents were loaded into QDA Miner and coded with the same coding scheme.

The coded data was then analyzed in the following two ways. First, all coded segments related to the *Network* theme were retrieved and then manually organized according to whether and how they related to the other codes, in this case ignoring the coding for the other themes in QDA Miner. The researcher then went through all of the

coded segments for the *Network* theme associated with other codes and summarized them in a brief sentence or phrase to highlight the key information within the segment. These summaries were then reviewed and combined together as appropriate to determine core categories. Table 5 provides the core categories associated with that process.

Table 5
Core Categories Derived from Manually Sorting Network Codes by Association with Other Codes

Logistics
Working with private organizations on the distribution of medications and PPE
Working with charitable organizations to meet the humanitarian needs of those in isolation/quarantine
Better coordination is needed for vaccine distribution
Issues regarding the disposal of medical waste need to be resolved.
Schools have strong potential for vaccination centers, but logistical issues still need to be resolved.
Discussion of attempts to create a coordinated network to deal with patients and prospective patients
Communications
Need for communication with vulnerable/at-risk populations
Need for improved coordination of federal agencies/departments
Improvements needed in the flow of information to and from the CDC.
There is a need for individuals with specialized communication expertise.
Communication networks must be inclusive.
Public-private partnerships are valuable to craft effective messaging and to disseminate it.
Relationships are valuable to better disseminate communications, but relationship building can be restricted by a lack of resources.

Table 5, continued

Information Management

Disease surveillance and monitoring is improved through collaboration.
Collaboration is valuable to track adverse reactions to vaccines.
Federal government has instituted a number of efforts to promote information sharing.
Efforts made to promote better state and local government communication, but more needs to be done in the area of relationship building.

Resources

Collaboration borne of limited resources.

Resources-Funding

Positive changes stemming from grant requirements in regard to participation/collaboration
Difficulties stemming from grant requirements in regard to participation/collaboration
There is a recognized need to better align/coordinate grant requirements
Grant funding is important to incentivizing collaboration, and the absence of grant funding may lead to the loss of collaborations.

Resources-Personnel

Inadequate supplies and shifting standards regarding personalized protective equipment create challenges for health care providers.
Improved coordination is needed to clarify roles during an emergency, allow personnel from one organization to be assigned tasks by another organization, and to communicate protocols and procedures to personnel.
Innovation and flexibility is needed to fill gaps in personnel resources.

Policy

CDC has an important role in making and promoting policy that governs the U.S. public health infrastructure, but the changing nature of guidance from the organization can create disruptions.
Federal agencies/departments regularly collaborate on the formation of policy in a public health emergency.
States grant and/or share power in regard to the making of policy regarding issues such as quarantine/isolation.
Numerous issues can create policy conflicts in the national public health system, including political division, shifting and/or incompatible policy, lack of coordination, fear, confusion, and legal/scientific pressures.

Table 5, continued

Legislation and regulations include provisions to require/encourage collaboration (i.e. designation of Ebola treatment centers).
Legislation and regulation can also include barriers to collaboration (i.e. lack of a clear state strategy inhibiting a regional response).
Departments, agencies and different levels of government coordinate policy making in preparation for or during an emergency (i.e. coordination regarding an emergency use authorization for antiviral drugs during an emergency).

Planning

Planning must incorporate a diverse range of partners, including all sectors that could be affected or may prove useful.
Relationship building is important for effective public health preparedness response, and planning has been found to be an effective tool for relationship building.

Preparedness

Regular drills are important to test readiness, hone skills, and keep lines of communication and relationships active.
Collaboration must span across all areas of health care, public health, and emergency management (i.e. hospital systems, emergency management, and mental health agencies).
Important that hospitals and public health work with national professional and charitable organizations to build capacity and make sure that when an event occurs the needs of those infected are met.

Next, the researcher used the QDA Miner program to find co-occurrences for all of the *Network* codes and the codes associated with the other themes: *Implementation, Governance,* and *Intelligence.* Coded segments were summarized in brief sentences or phrases to capture the key information within the segment. These summaries were then combined as appropriate, with the process producing the core categories presented in Table 6.

Table 6
Core Categories Derived from Co-Occurrences between Network Themes and Other Themes Found Using QDA Miner

Network/Governance
Aligning grant standards with other professional standards has value.
CDC guidelines/information insufficient or frequently changing
Difficulties with disposing of medical waste created by unclear or conflicting policies
Power and enforcement delegated from one level of government to another
Uncertainty among health care workers regarding safety due to changing policy/protocols
Public health response helped by work done to address previous emergencies
Policies can be put in place in advance to respond to an emergency (i.e. emergency use authorizations, or EUA's).

Network/Implementation
Federal funding of demonstration projects regarding communication and logistics has led to improvements.
Tabletop exercises are used to gauge preparedness in information management/logistics.
Network/Intelligence
Importance of a national biosurveillance network to improve situational awareness
Elements of an effective information campaign: coordinated, relevant, modulated, appropriate, fluid, addresses non-English speakers
Some types of communication ineffective, some types of communication not used effectively enough
National organizations acted as partners in communication.
Need to be inclusive in what health entities are involved in education, training, communication, and surveillance

The two sets of core categories were then compared and combined into a final, integrated set of core categories presented in Table 7:

Table 7
Condensed and Integrated List of Core Categories

Network/Governance
CDC has an important role in making and promoting policy that governs the U.S. public health infrastructure, but the changing nature of guidance from the organization can create disruptions. CDC guidelines/information were insufficient or frequently changing.
Difficulties with disposing of medical waste were created by unclear or conflicting policies. Issues regarding the disposal of medical waste need to be resolved.
Power and enforcement is delegated from one level of government to another. States grant and/or share power in regard to the making of policy regarding issues such as quarantine/isolation.
Uncertainty among health care workers regarding safety due to changing policy/protocols.
Departments, agencies, and different levels of government coordinate policy making in preparation for or during an emergency (i.e. coordination regarding an emergency use authorization for antiviral drugs during an emergency).
Planning must incorporate a diverse range of partners, including all sectors that could be affected or may prove useful.
Network/Intelligence
Regular drills are important to test readiness, hone skills, and keep lines of communication and relationships active. Tabletop exercises are used to gauge preparedness in information management/logistics.
Disease surveillance and monitoring is improved through collaboration/Importance of a national biosurveillance network to improve situational awareness must be considered.
Elements of an effective information campaign include coordinated, relevant, modulated, appropriate, fluid, and addresses non-English speakers. There is need for stronger communication with vulnerable/at-risk populations.
There is a need for individuals with specialized communication expertise. Some types of communication are ineffective, some types of communication are not used effectively enough.

Table 7, continued
National organizations acted as partners in communication.
Communication networks must be inconclusive.
Organizations need to be inclusive in what health entities are involved in education, training, communication, and surveillance.

Network/Implementation
There is a recognized need to better align/coordinate grant requirements/aligning grant standards with other professional standards.
Inadequate supplies and shifting standards regarding personalized protective equipment create challenges for health care providers.
Important that hospitals and public health agencies work with national professional and charitable organizations to build capacity and make sure that when an event occurs the needs of those infected are met.

After careful consideration and prioritization of the combined set of core categories, the following theoretical codes are proposed:

- Public health planning and preparedness policy at all levels of government needs to be revised and strengthened to do away with policy barriers that impede planning and action.

- The building and maintenance of relationships at the federal, state, local, and tribal levels is essential to effective public health planning and response.

Based on these theoretical codes, the following grounded theory is proposed:

Public health planning and preparedness policy needs to be revised and strengthened, particularly at the federal level, to provide resources and break down barriers, thus facilitating essential relationship building and maintenance at the federal, state, local, and tribal levels.

DISCUSSION

The federal government must work to create a stronger policy infrastructure to allow states and localities to respond to different and changing public health emergencies. This includes further coordinating grant requirements to allow hospitals and public health organizations to more easily work with other emergency responders on planning and preparedness. One interview participant commented:

> Getting all of these grants coordinated has been very difficult in some cases because you have the hospitals, who are getting their grant money from ASPR (Assistant Secretary for Preparedness and Response), which is HHS (U.S. Department of Health and Human Services), you have the public health department that is getting their emergency planning funding through CDC, and then you have the homeland security side getting their funding through federal homeland security. I sometimes wonder if these three groups ever talk to each other. It's getting better now, but it's taken quite a while (Interview, June 3, 2014).

This supports the findings of Jacobson, Wasserman, Botoseneanu, and Wu (2012) that state and local officials want more coordination among federal programs which will hopefully produce clearer guidance. Some evidence of this can be found in the alignment of CDC and HRSA grants. Previous research has found that alignment of regions associated with different types of preparedness has yielded positive results (Beitsch, et al., 2006).

Improved coordination is also needed in regard to anticipatory public policy, like the CDC and the U.S. Food and Drug Administration's collaboration on the issuance of

EUA's. The value of this was discussed in the U.S. Health and Human Services Department retrospective on H1N1:

> Because FDA and CDC had been working together over the preceding three years on two test approvals, CDC was able to rapidly provide the needed data on test performance to allow FDA to grant an Emergency Use Authorization (EUA). This authorization allowed CDC to distribute 2009 H1N1 reagents to state public health laboratories. Without this authorization, states would have had to order their own reagents and independently validate their own assays for detection of the novel influenza strain. Because of this preparation and the strong partnership between CDC, FDA, industry, and state laboratories, CDC was able to prepare and ship 372 kits to qualified laboratories under the EUA within one week and to all laboratories within two weeks of the initial detection of 2009 H1N1 influenza virus in Southern California (HHS Retrospective, 2012).

Courtney, Sherman, and Penn (2013) noted the value of emergency use authorizations and new drug applications for increasing the speed with which countermeasures can be produced. These kinds of pre-event policies can also be useful in providing better flexibility and guidance to public health response personnel (Rutknow, 2014).

Another area in which national and interstate policy conflicts need to be resolved are logistical issues like the transportation of infected medical waste.

> Dealing with this collection of pathogen-filled debris without triggering new infections is a legal and logistical challenge for every U.S. hospital now preparing for a potential visit by the virus. In California and other states, it is an even worse waste-management nightmare. Though the U.S.

> Centers for Disease Control and Prevention recommend autoclaving (a form of sterilizing) or incinerating the waste as a surefire means of destroying the microbes, burning infected waste is effectively prohibited in California and banned in at least seven other states (Morin, 2014, Oct. 20).

The need to resolve these policy conflicts is highlighted by Jacobson, Wasserman, Botoseneanu, and Wu's (2012) finding that practitioners tend to rely on their understanding of the law as opposed to the letter of the law. Practitioners and attorneys may better understand how to act in such situations if legal references were more widely available (Bernstein, 2013) and public health legal competencies were incorporated into public health and legal professional education programs (Gebbie et al., 2008).

In addition, improved lines of communication need to be cultivated and maintained between the federal government and national organizations representing public health and health provider interests in order to be more transparent in communicating changing thinking and science regarding issues such as personal protective equipment. The U.S. government should also use these channels to solicit feedback on such guidance before it is issued. This type of communication was helpful to hospitals during the Ebola response.

> Dameron Hospital's "pandemic response team" has met daily since Ebola arrived and is in close contact with state, federal and local health agencies, Chief Operating Officer Michael Glasberg said. That includes working with the American Hospital Association to learn lessons from Dallas, where the virus first appeared in the United States (Johnson, 2014, October 28).

This is keeping with the recommendation of Gebbie et al.(2008) to create vertical and horizontal communities of practice to develop specific practices for specific communities and events.

The federal government, as well as other levels of government, should make the best use of communications experts such as public information officers and people with other unique communications expertise to facilitate better sharing of information. Some of the H1N1 after-action reports indicated that public information officers were an extremely valuable resource at the local level.

> Many counties expressed excellent coordination between their PIO and LHD [local health department]. There was a strong team effort for the consistent, relevant information that met local needs (Oregon Department of Human Services, 2010).

Thompson (1967) noted that the sharing of information across organization boundaries is important to successful collaboration. During the response to H1N1 in Marion County, Indiana, the local health department used public information resources to educate the public and alert emergency personnel to changes in treatment recommendations (Gibson, Theadore, and Jellison, 2012).

One thing the government appears to do exceedingly well is collect biosurveillance information, but that information has limited value if it cannot be disseminated effectively. Regular testing of communication and other preparedness capabilities is essential, as is the inclusion of all relevant partners in that network. This was noted in interviews with preparedness professionals.

> What keeps us strong other than having the devices is that we exercise them every month to make sure everyone's devices are working properly and they can communicate. And then we

> have little mini-exercises with Live Process where we'll communicate with each other through that and make sure that people know how to use it. Some of the barriers of that communication is that it takes time. Like with Live Process, we are learning it, and not everyone has the time or will take the time to learn it well enough that you can just sit down and handle your whole dialogue through that. Everything that you need to do during a disaster and be able to communicate back and forth is in Live Process and if someone needs a document or you need to pull up the document you need to know how to do that in Live Process (Interview, June 4, 2014).

The 2010 ASTHO report found that there was a lack of unified command structure during H1N1, creating difficulties with coordination and communication. The report recommended that states and the federal government use grants and cooperative agreements to build capacity to employ an incident command system during a public health emergency (ASTHO, 2010). Communication exercises like the one discussed above can help to build a coordinated system, as well as demonstrate and strengthen unity of mission among response partners (Ospina and Saz-Carranza, 2010). Full participation is made difficult by recent state and local public health budget cuts and the resulting reduction in the workforce (Walsh et al., 2015).

The difficulties this lack of resources can create for public health emergency preparedness were illustrated in comments by the local public health department representative. He noted that while he was aware of one county employee in Indiana paid for by a line-item in the county budget, such a situation is very rare in Indiana. He also pointed out that, in public health, preparedness is almost always an additional duty, not a primary occupation.

This creates significant challenges for those charged with preparedness. Some preparedness coordinators in public health departments budget two to four hours one day a week to handle preparedness responsibilities, according to the public health official. Yet these individuals are expected to accomplish the same work as someone focusing on preparedness full time. The burdensome nature of the grant funding process can contribute to the problem of overworked preparedness coordinators questioning whether pursuing grant funding is worth the cost (Interview, March 4, 2014).

In light of funding and resource shortages, the U.S. government must provide resources to incentivize relationship building and build up relationships of its own to communicate the importance of public health planning and preparedness. A hospital preparedness representative noted that the district he works in has two to three more years remaining on the current grant cycle and the district is confident its funding will continue during that time frame. In the event the grant is cut entirely or becomes too small to manage the district, it would gravely affect its ability to provide planning, resources and education services. While the hospitals in the district have explored ways to keep the collaboration sustainable, it lacks true financial capability outside of the grant. No hospitals he is aware of have a dedicated budget line-item for preparedness, making most hospital emergency preparedness efforts 100% dependent on grant funding. If such funding were no longer available, some larger hospital preparedness districts may attempt to continue, but smaller collaborative groups would find it very difficult (Interview, Jan. 30, 2014). This was supported by other evidence.

> We are federally funded and its [funding] regulated by the state. So that's our only form of income. The issue with that is that it's getting cut every day. Eventually we think it is going to go

> away. So the challenge is we're trying to find other grants, other means of resources so once the funding goes away we still have resources to continue our mission.
>
> At our last meeting, that was one of the big issues- we need to come up with other resources. That is a big issue. There's upkeep of the whole organization that really needs funding because we have emergency trailers and other equipment that has yearly insurance and things like that (Interview, July 10, 2014).

Substantial literature supports the value of using funding programs as a catalyst to the building of relationships, with the presence of such funds resulting in the development of pandemic influenza plans and other emergency planning and response activities (Waugh, 2002, as cited in Waugh and Streib, 2006; Rosselli et al., 2010; Harris and Mueller, 2013). Alternatively, the loss of funds hurt capacity to engage in surveillance, investigation, and legal preparedness (Harris and Mueller, 2013). In regard to the importance of collaboration at the federal level, in her 2009 testimony before the Senate Committee on Homeland Security and Government Affairs, Secretary Sebelius said,

> HHS values the collaborative relationships established with our partners at the Departments of Homeland Security and Education and has leveraged these relationships to develop clear and actionable guidance for schools and businesses. In close collaboration with the Department of Education, CDC has released guidance and information for K-12 schools, as well as universities and colleges, advising administrators on the measures that can be taken to mitigate disease spread in educational settings while limiting the disruption of day-to-day activities and

> the vital learning that goes on in schools and institutions of higher education (Sebelius, October 29, 2009).

The importance of collaboration between federal agencies and departments was also noted in the HHS retrospective report.

> Relationships created between ASPR, CDC, DHS (Department of Homeland Security), and ED (Department of Education) that were formed during previous interagency pandemic exercises and other programs conducted prior to the 2009 pandemic were valuable to the actual H1N1 response. For example, prior to 2009 H1N1, the Homeland Security Council (HSC, renamed the National Security Staff [NSS] in 2009) held meetings with the interagency regularly to ensure progress was being made on implementation of the national pandemic strategy and implementation plan, which would help facilitate coordination among federal agencies in the event of a future pandemic. These interagency meetings were continued during the 2009 H1N1 pandemic response. These interagency meetings were credited with making communication and coordination during the H1N1 response easier than it would have been otherwise. (HHS Retrospective, 2012).

Each level of government delegates authority to others, but this can only be done effectively if resources are also delegated and different levels of government understand the strengths and limitations of partners. The county emergency management agency director pointed out that in the emergency management field there can be a sense of competition and a need to establish credibility that can

discourage emergency management directors from reaching out to colleagues for assistance. This attitude that they need to handle everything on their own can eventually lead to burn out among these professionals (Interview, June 20, 2014). Policy supporting the building of relationships can help to avoid this, but relationships follow policy that offers resources to support collaborations and also allows for the sharing of resources and information. This was supported in a number of the interviews:

> Ten years ago I don't think that was happening outside of your immediate area. So I think it's that we are all trying to work in unison. Yeah there are a few disagreements, and we do things differently than they do in Evansville or Terre Haute, but we're meeting, we're seeing, we're building those relationships. Before I retired, I was able to pick up the phone and call people six counties away from me because I knew they had similar issues that they had solved that I had experienced at my hospital. Or that they had an instructor come into their district that was very good that I could get over here. So it's the relationships that have been built and the sharing of best practices that have been the best thing to come out of these collaborations (Interview, June 3, 2014).

> Having these relationships in place, allows for quicker resolution of issues in an emergency situation because you don't have to deal with introductions and formalities. You can skip right through those and get to what needs to be done. So relationship building is very valuable. The LEPC (Local Emergency Planning Committee) serves as a collection point so that information can be disseminated concerning what actions are being taken on a county-wide bases for hazardous materials (Interview, June 4, 2014).

Data from the interviews indicates that more effort should be placed toward building collaborations between organizations like public health agencies and health care systems (Markiewicz et al., 2012). Absent that, the federal government will have to work with trusted organizations like the Association of State and Territorial Health Officials (ASTHO) and the National Association of City and County Health Officials (NACCHO) to communicate the importance of on-going public health planning and preparedness:

> As in all potential infectious disease outbreaks, the CDC is communicating through the National Association of County and City Health Officials (NACCHO) and the Association of State and Territorial Health Officials (ASTHO) to prepare individual health agencies across the country to respond to a case of Ebola in their jurisdictions (Vestal, 2014, October 15).

Regardless of the degree to which collaborations are built at other levels, CDC should continue to draw upon these national organizations as a resource, as collaboration is an acknowledgement that no single government or organization can succeed acting alone (Bryson, Crosby, and Stone, 2006).

CONCLUSION

Issues like communication, education, surveillance, and public health information have been explored extensively in the public health emergency preparedness literature (Khan et al., 2015), but more attention, needs to be given to the policy structure at the federal level. Policy barriers and conflicts between organizations within the federal government must be identified and resolved in order

to allow for more pre-event policy-making. At the same time, public health preparedness research should focus on federal organizations and how they can work with state and local agencies, with the assistance of national organizations like ASTHO, to address conflicts between federal guidance and state and local policy so that federal guidance can be quickly implemented. Finally, stakeholders in public health emergency response should continue to align grant capabilities and requirements across all agencies.

REFERENCES

Agranoff, R. and McGuire, M. (2003). *Collaborative public management: New strategies for local governments.* Washington, DC: Georgetown University Press.

Allen, H. & Katz, R. (2010). Demography and public health emergency preparedness: making the connection. *Population Research and Policy Review*, *29*(4), 527-539.

Association of State and Territorial Health Officials. (2010). *Assessing policy barriers to effective public health response in the H1N1 influenza pandemic: Project report to the centers for disease control.* Accessed from http://www.astho.org/Programs/Infectious-Disease/H1N1/H1N1-Barriers-Project-Report-Final-hi-res/ on March 24, 2014.

Barnett, D.J., Taylor, H.A., Hodge, J.G., Jr., & Links, J.M. (2009). Resource allocation on the frontlines of public health preparedness and response: report of a summit on legal and ethical issues. *Public Health Reports, 124*(2), 295-303.

Barnett, D.J, Thompson, C.B., Errett, N.A., Semon, N.L., Anderson, M.K., Ferrell, J.L., Freiheit, J.M., Hudson, R., Koch, M.M., McKee, M., Mejia-Echeverry, A., Spitzer, J., Balicer, R.D., & Links, J.M. (2012). Determinants of emergency response willingness in the local public health workforce by jurisdictional and scenario patterns: a cross-section survey, *BioMed Central, 12*:164.

Barrett, R. & Brown, P.J. (2008). Stigma in the time of influenza: social and institutional responses to pandemic emergencies. *The Journal of Infectious Diseases, 197*(Supplement 1), s34-s37.

Beitsch, L.M., Kodolikar, S., Stephens, T., Shodell, D., Clawson, A., Menachemi, N., & Brooks, R.G. (2006). A state-based analysis of public health preparedness programs in the United States. *Public Health Reports, 121*(6), 737-745.

Bernstein, J. A. (2013). Beyond public health emergency legal preparedness: rethinking best practices. *The Journal of law, medicine & ethics: a journal of the American Society of Law, Medicine & Ethics*, *41*, 13.

Bryson, J. M., Crosby, B.C. and Middleton Stone, M. (December 2006). The design and implementation of cross-sector collaborations: Propositions from the literature." *Public Administration Review.* Special Issue, 44-55.

Courtney, B., Sherman, S., & Penn, M. (2013). Federal legal preparedness tools for facilitating medical countermeasure use during public health emergencies. *The Journal of Law, Medicine & Ethics*, *41*(s1), 22-27.

Davis, M.V., Bevc, C.A., & Schenck, A.P. (2014). Declining trends in local health department preparedness capacities. *American Journal of Public Health. 104*(11), 2233-2238.

French, P. E. (2011). Enhancing the legitimacy of local government pandemic influenza planning through transparency and public engagement. *Public Administration Review, 71*, (2), 253-264.

French, P.E. & Raymond, E.S. (2009). Pandemic influenza planning: An extraordinary ethical dilemma for local government officials. *Public Administration Review, 69*, (5), 823-830.

Gebbie, K.M., Hodge, J.G., Jr., Meier, B.M., Barrett, D.H., Keith, P., Koo, D., Sweeney, P.M. & Winget, P. (2008). Improving competencies for public health emergency legal preparedness. *Journal of Law, Medicine, & Ethics, 36*(1), 52-56.

Gibson, P.J., Theadore, F., & Jellison, J.B. (2012). The common ground preparedness framework: a comprehensive description of public health emergency preparedness. *American Journal of Public Health, 102*(4), 633-642.

Glesne, Corrine. (2006). *Becoming qualitative researchers: an introduction*, 3rd Ed. New York: Pearson.

Gray, B. (1996) Cross-sectoral partners: Collaborative allies among business, government and communities." In C. Huxham (Ed.), *Creating collaborative advantage* (pp. 57-59). Thousand Oaks, CA: Sage Publications.

Griffith, J.M., Carpender, S.K., Artzberger Crouch, J., & Quiram, B.J. (2014) A public health hazard mitigation planning process. *Journal of Public Health Management and Practice, 20*(5), S69-S75.

Harris, J.K. & Mueller, N.L. (2013). Policy activity and policy adoption in rural, suburban, and urban local health departments. *Journal of Public Health Management and Practice, 19*(2), E1-E8.

Interview with Hospital Preparedness Representative. Conducted by phone on January 30, 2014.

Interview with Local Public Health Representative Affiliated with HPD. Conducted by phone on March 4, 2014.

Interview with Former Hospital Preparedness Official and Hospital Executive. Conducted by phone on June 3, 2014.

Interview with Two Hospital Preparedness Practitioners. Conducted by phone on June 4, 2014.

Interview with County Emergency Management Agency Director. Conducted by phone on June 20, 2014.

Interview with Hospital Preparedness Coalition Business Manager. Conducted by phone on July 10, 2014.

Jacobson, P.D., Wasserman, J., Botoseneanu, Silverstein, A., & Wu, H.W. (2012). The role of law in public health preparedness: opportunities and challenges. *Journal of Health Politics, Policy, and Law, 37*(2), 297-328.

Johnson, Z.K. (2014, October 28). *Ebola training for local health care workers*. Distributed by *McClatchy Tribune Business News.*

Kettl, D. F. (2000). *The global public management revolution: A report on the transformation of governance*. Washington, DC: The Brookings Institution Press.

Kettl, D.F. (2007). *System under stress: Homeland security and american politics*, 2nd Ed. CQ Books.

Khan, Y., Fazli, G., Henry, B., de Villa, E., Tsamis, C., Grant, M., & Schwartz, B. (2015). The evidence base of primary research in public health emergency preparedness: a scoping review and stakeholder consultation. *BioMed Central, 15,* 432.

Kiefer, J. J. and Montjoy, R.S. (December 2006). "Incrementalism before the storm: Network performance for the evacuation of New Orleans." *Public Administration Review.* Special Issue, 122-130.

Kun, K.E., Rose, D.A., Morris, T., Salter, M., Lamia, T., Bhalakia, A., & McLees, A.W. (2014). *Journal of Public Health Management and Practice, 20*(4), E1-E5.

Lee, T.W. (1999). *Using qualitative research in research.* Thousand Oaks, CA: SAGE.

Lin, L., Saviola, E., Agboola, F., & Kasiomayajula, V. (2014). What have we learned about communication inequalities during the H1N1 pandemic: a systematic review of the literature. *BioMed Central Public Health, 14,* 484.

Lister, S. (2014, October 9). Funding history for public health and hospital preparedness grants to states. Congressional Research Service. Retrieved from http://s3.documentcloud.org/documents/1312455/crs-report-on-hpp-and-phep-appropriations.pdf on November 15, 2014.

Logsdon, J.M. (1991). "Interests and interdependence in the formation of social problem-solving collaborations." *Journal of Applied Behavioral Science* 27 (1): 23 – 37.

Lurie, N., Manolio, T., Patterson, A.P., Collins, F., & Frieden T. (2013). Research as a part of public health emergency response. *The New England Journal of Medicine, 368*(13), 1251-1255.

Luton, L.S. (2010). *Qualitative research approaches for public administration.* Armonk, NY: ME Sharpe.

Markiewicz, M., Bevc, C.A., Hegle, J., Horney, J.A., Davies, M. & PDM MacDonald. (2012). Linking public health agencies and hospitals for improved emergency preparedness: North Carolina's public health epidemiologist program. *BioMed Central, 12,* 141.

Marshall, C. & G. Rossman. (2006). *Designing qualitative research*, 4th Ed. Thousand Oaks, CA: SAGE.

Marshall, C. & G. Rossman. (2016). *Designing qualitative research*, 6th Ed. Thousand Oaks, CA: SAGE.

Moore, M. H. (1995). *Creating public value.* Cambridge, MA: Harvard University Press.

Morens, D.M., Taubenberger, J.K., & Fauci, A.S. (2013). Pandemic influenza viruses-hoping for the road not taken. *New England Journal of Medicine, 368*(25), 2345-2348.

Morin, M. (2014, Oct. 20). *A vexing side of Ebola; as hospitals prepare for potential cases, they must plan for piles of medical waste. The Los Angeles Times,* p. A1.

Oregon Department of Human Services: Public Health Division. (n.d.) *State of Oregon September 2009 to July 2010 H1N1 response after action report/improvement plan.* Obtain via email from the Oregon Health Authority.

Ospina, S. M. and Saz-Carranza, A. (2010). Paradox and collaboration in network management. *Administration & Society,* 42, p. 404-440.

Provan , K. G.and Milward, H.B. (1995). A preliminary theory of interorganizational effectiveness: A comparative study of four community mental health systems. *Administrative Science Quarterly*. 4(1), 1 – 33.

Radin, B.A. (2002). *The accountable juggler: The art of leadership in a federal agency.* Washington, D.C.: CQ Press.

Rainey, G. W., Jr., and Busson, T. (2001). Assessing and modeling determinants of capacity for action in networked public programs. In M.P. Mandell (Ed.), *Getting results through collaboration: Networks and network structures for public policy and management*, p. 49 – 70. Westport, CT : Quorum Books.

Rosselli, R.T., Davis, M.K., Simeonsson, K., Johnson, M., Goode, B., Casani, J., & MacDonald, P.D.M. (2010). An academic/government partnership to provide technical assistance with pandemic influenza planning to local health departments in North Carolina. *Public Health Reports, 125*(Supplement 5), 92-99.

Rutknow, L. (2014). An analysis of state public health emergency declarations. *American Journal of Public Health, 104*(9), 1601-1605.

Saumure, K. & Given, L.M. (2008). Data saturation. In L.M. Given (Ed.), *The SAGE encyclopedia of qualitative research methods* (p. 519). Thousand Oaks, CA: Sage.

Scanlon, J. (2004). Lessons learned or lessons forgotten: The Canadian disaster experience. Institute for Catastrophic Loss Reduction, Paper no. 1.

Sebelius, K.S. (2009, October 29). *2009 H1N1 influenza: monitoring the nation's response.* Delivered to the U.S. Senate Committee on Homeland Security and Government Affairs. Retrieved from http://www.hsgac.senate.gov/hearings/h1n1-flu-monitoring-the-nations-response.

Thompson, J.D. (1967). *Organizations in Action.* New York: McGraw-Hill.

Thomson, A.M. & Perry, J.L. (December 2006). Collaboration processes: Inside the black box. *Public Administration Review.* Special Issue, 20-32.

Upshur, R.E.G., Faith, Karen, Gibson, J.L., Thompson, A.K., Tracy, C.S., Wilson, K., & Singer, P.A. (2007). Ethics in an epidemic: Ethical considerations in preparedness planning for pandemic influenza. *Health Law Review, 16*, (1), 33-39.

U.S. Department of Health and Human Services. (2012) *An HHS retrospective on the 2009 H1N1 influenza pandemic to advance all hazards preparedness.* Retrieved from http://www.phe.gov/Preparedness/mcm/h1n1-retrospective/Documents/h1n1-retrospective.pdf on March 24, 2014.

Vestal, Christine. (2014, October 15). *What are states doing to prepare for Ebola.* Distributed by *McClatchy Tribune Business News.*

Walsh, L., Garrity, S., Rutkow, L., Thompson, C.B., Strauss-Riggs, K., Altman, B.A., Schor, K., and Barnett, D.J. (2015). Applying a behavioral model framework for disaster recovery research in local health agencies: a conceptual approach. *Disaster Medicine and Public Health Preparedness, 9*, 403-408. Doi: 10.1017/dmp.2015.44.

Waugh, W. L. (2002). *Leveraging networks to meet national goals: FEMA and the safe construction networks* . Washington, DC : Pricewaterhouse Coopers Foundation for the Business of Government.

Waugh, W. L. and Streib, G. (December 2006). Collaboration and leadership for effective emergency management. *Public Administration Review.* Special Issue, 131-140.

Weber, E. and Khademian, A.M. (2008). "Managing Collaborative Processes: Common Practices, Uncommon Circumstances." *Administration & Society,* Vol. 40, p. 431.

Yeager, V.A., Hurst, D., & Menachemi, N. (2015). State barriers to appropriating public health emergency response funds during the 2009 H1N1 response. *American Journal of Public Health, 105*(2), S274-S279.