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A Limited Rational Choice Theory in Local Public Health Decision Making

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Abstract

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by

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MS, Wilmington University, 2003

BS, Southern Illinois University at Carbondale, 1999

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The threat and occurrence of terrorist attacks have increased in the United States since September 2011, heightening concerns for weaponized anthrax, other biological pathogens, and epidemics and pandemics. Early decisions and funding levels in local public health agencies can be the first line of defense or first point of failure; yet little is understood about how decisions are made when there are budget cuts before a biological event happens. Using Lindblom's conceptualization of limited rational choice theory, the purpose of this single case study was to understand how a local public health official made decisions after budget cuts in a single public health entity in the mid-Atlantic area of the United States. Data were collected through an interview with 1 public health official and publicly available plans, procedures, and funding documents. These data were inductively coded and then subjected to Braun and Clarke's thematic analysis procedure. Findings indicated that the public health agency's ability to make the best decisions were negatively impacted by limited resources, though adequate planning before a catastrophic event, active and continual communication with stakeholders, and clarity about financial and resource needs can partially offset the impact of budgetary reductions. The implications for social change include recommendations to anticipate and address the needs of the public health system through decision making to protect the health care community and the reduction or elimination of the spread of disease in the wake of a biological incident.

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Dedication

First and foremost, all of the glory and honor belongs to my Lord and Savior Jesus Christ, my hallelujah belongs to you, for this would not have been possible without you. I dedicate this achievement to my husband, Les, and my children, Darryl, Mason, Lena, and Donovan. Thank you for your love, patience, and encouragement. I dedicate this to my mother, Erma J. Scott (deceased 1996), who always reminded me that I was intelligent enough to achieve anything I wanted regardless of the challenges that I may encounter throughout my life. I also dedicate this achievement to my family members and close friends who prayed for me and encouraged me throughout the entire process.

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Chapter 1: Introduction to the Study

Introduction

The emergence of the Middle East respiratory syndrome-related coronavirus (MERS-CoV), a viral respiratory infection new to humans, mistakes in the management of the Ebola virus disease in Dallas, Texas, in October 2014, and the mishandling of biological pathogens in high-level laboratories throughout the United States resurrected concerns about state and local public health planning for public health emergencies. Emerging data suggest that local jurisdictions nationwide may have been ill prepared for disasters and public health emergencies (Gursky & Bice, 2012; Henstra, 2010; Trust for America's Health [TFAH], 2014, 2015; Yoon, Youngs, & Abe, 2012). Hindering this already situation of ill preparedness were budget cuts to state and local public health programs, which forced policy and planning decision makers to reexamine resource allocations for public health initiatives. For 3 consecutive years, 2012-2014, a mid-Atlantic state made cuts in public health funding, which negatively affected local initiatives to plan for the prevention and control of infectious disease (TFAH, 2014). Despite the budget cuts, the local public health agencies still retained the responsibility of developing plans and policies to protect the community and prevent the spread of infectious diseases in addition to the myriad other necessary public health functions (IOM, 2012). Making and defending decisions to allocate scarce resources toward infectious diseases that are likely to happen, such as influenza, and diseases less likely to happen, such as Ebola, can prove to be challenging for public health officials. In addition to funding cuts, public health emergency decision making may be further complicated by

political pressure and the need to make quick decisions (Varma, 2015). Understanding how local public health agencies make decisions with limited resources in an economic downturn is vital to identifying weaknesses that may exist prior to a public health emergency. Moreover, awareness of how public agencies make resource allocation decisions will inform the community why certain decisions were made. This insight and discernment will raise the public level of trust in local health agencies and help facilitate the identification of strengths and weaknesses in the agencies' decision making processes.

Limited evidence shows the extent to which local public health districts in the mid-Atlantic state were using formal decision making processes to maximize scarce resources. Little was known about the public health preparedness of local public health agencies such as the local health districts in mid-Atlantic state and what they discerned as challenges to enhancing decision making in their planning and policy development processes. Decision making strategies are indispensable to informing policy and plan development and help guide the allocation of vital resources to enable local public health agencies to reach desirable levels of public health preparedness (Lurie, Wasserman, & Nelson, 2006; Nelson, Lurie, Wasserman, & Zakowski, 2007). In addition, although public health is a burgeoning field, it lacks empirical research (Nelson et al., 2007; Yeager, Menachemi, McCormick, & Ginter, 2010). Accordingly, scholarship and empirical data regarding public health preparedness in local jurisdictions are needed to expand the emerging literature (Yeager et al., 2010).

Identifying how decision making occurs at the mid-Atlantic state Department of Health will provide insight on the barriers that impede desirable results and provide best practices to help inform other public health organizations. Methodical decision making enables every step of the decision making process to be dissected and analyzed to determine the best solutions to the most complicated problems. In public health, uncertainty exists in determining when or where the next disease outbreak will occur and the cost to contain the outbreak. Preidentified decisions made to confront these complex problems equate to the controlled spread of disease when decisions are careful and deliberate. The social change implications of studying how decision making works in the mid-Atlantic state Department of Health include the identification of complications that may impede critical decisions concerning the health and safety of the communities, a theoretically based approach to the enhancement of decision making at the local government level, and an improved delivery of public health services as a result of clearer decision making processes.

In this chapter, I have introduced the research topic and provided an overview of the study. In the background section of the chapter, I will highlight current literature regarding budgetary challenges local public health agencies in the United States have faced in preparing and protecting communities from infectious disease threats, summarize gaps in the literature, and provide a rationale for conducting the study. Next, I will offer a problem statement to define and delineate the research problem. This will be followed by a statement describing the purpose of the study and the research questions that have guided the study. I will then provide an explanation of the conceptual

framework underpinning this study, followed by a concise description of the nature of the study, an enumeration of definitions, and statements explicating the assumptions, limitations, scope, and delimitations that I used in the study. I then address the significance of this research, with implications for social change, followed by a concluding summary of the chapter and a transition statement to introduce Chapter 2.

Background

Public health is a science encompassing numerous aspects of family and community health and well-being, which also includes controlling the spread of infectious disease. According to the Institute of Medicine (IOM, 2012), essential public health services include, but are not limited to, investigating and controlling disease outbreaks; developing and enforcing laws and regulations to protect health; monitoring and reporting on community health status; educating the public about health risks and prevention strategies; and assuring the safety and quality of water, food, air, and other resources necessary for health. These functions and responsibilities are executed among public health agencies at the federal, state, and local levels of government (IOM, 2012). In addition, public health agencies are involved in preparing for and responding to any hazard or threat that can create a public health emergency, such as the Zika virus, Ebola, hurricanes, earthquakes, floods, and the contamination of potable water incidents (IOM, 2012).

Local public health departments have an important role to play in ensuring that communities and vulnerable residents are protected from the health consequences of hazards and threats, in fortifying and supporting community health systems, and in

advancing public health preparedness efforts to combat the health threats that can create a public health emergency (IOM, 2012). Public health emergencies can occur when a disease or disorder presents a threat of outbreak of infectious disease that occurs naturally or is caused by a bioterrorist attack. The U.S. Congress has enacted legislation to improve the nation's public health and medical preparedness and response capabilities for emergencies and to provide funds to enable state and local public health agencies to improve preparedness and health outcomes for a wide range of public health threats throughout the country (Frist, 2002; Gursky & Bice, 2012; IOM, 2012; NACCHO, 2016). However, historically, federal recognition or declaration of a public health emergency does not spontaneously activate the release of federal funds to local public health departments to respond to the public health emergency, regardless of whether the affected locality can bear the financial burden.

A wealth of empirical studies and research regarding public health emergencies have been conducted, decreases in public health funding, public health system preparedness, and emerging disease threats in the body of literature. Although the public health literature includes studies that emphasize the importance of prioritization, research, decreased funding, and the need for sufficient resources, the linkages between these identified issues and effective decision making from a theoretical perspective has been inadequately explored, thereby creating a gap in knowledge.

The Public Health Service Act (PHSA), passed by Congress in 1944, gave the Public Health Service (PHS) the responsibility of preventing the spread or transmission of disease from foreign countries into the United States. This authority was then

delegated from the PHS to the Centers for Disease Control (CDC) in 1967. At the time of this study, regulations created under the PHSA were currently being revised, citing the need for the federal government to respond more quickly, more efficiently, and more effectively to emerging outbreaks. The need for a revision that would lead to a better response was recognized during the Ebola scare of 2014, the MERS outbreak that started in South Korea, and the repeated outbreaks of measles and tuberculosis in the United States (CDC, 2016). Inadequate decision making was evident during the response to the Ebola scare, when health care workers were unprepared and leaders made ill-informed decisions based on fear, political pressure, and a lack of empirical evidence, jeopardizing disease-control efforts (Annas, 2016; Carafano, 2015; Ulrich, 2016). For domestic outbreaks, the speed of the federal response is only as strong as the public health system at the local level. The unpredictability of where an infectious disease is likely to occur and cause an outbreak is disconcerting to local public agencies and heightens concerns regarding how they would make decisions concerning infectious-disease-related programs and policies in the wake of substantial budget cuts (Frist, 2002; Gursky & Bice, 2012).

The "all disasters are local" idea, asserted by former FEMA Deputy Administrator Richard Serino (Pittman, 2011), is also true and applicable to public health as it concerns infectious disease. Regardless of where someone is infected, he or she is likely to present him or herself to a health care professional in an ambulance, clinic, or hospital emergency room. In a worst-case scenario, the person may not have exhibited symptoms but may have been contagious and unknowingly spread the disease. At some point, depending on

preidentified protocols, the local health care system will have to identify and communicate the presence of an infectious disease that could potentially cause an outbreak. If a contagious infectious disease is confirmed, the resulting outcomes may be unpredictable if actions were not preidentified or decision making had not previously occurred. A similar situation happened in 2014, when a Liberian citizen travelled from Monrovia to Dallas, Texas, where he presented to a hospital emergency room with Ebola symptoms and was sent home with antibiotics, only to return later with exacerbated symptoms; he infected two nurses and ultimately died from the disease (Annas, 2016; Gostin, Hodge, & Burris, 2014). Although the Ebola epidemic had been discussed extensively in the media and among the public health community prior to the Dallas incident, federal and state officials had not yet communicated guidance for the protection of health care workers or citizens from exposure to the Ebola virus disease. Lawmakers did, however, impose quarantine measures for health care workers who were likely exposed to Ebola, which some believed to be unconstitutional (Annas, 2016). In addition, inconsistent messages were communicated to the mainstream media about how the disease could be spread, causing public chaos and panic (Ratzan & Moritsugu, 2014; Ulrich, 2016). If local public health officials lack an established decision making process or the resources to quickly gather informed data to make collective decisions on public messaging, chaos and anxiety can overshadow or hinder response efforts.

The Dallas case led Congress to approve the reauthorization of the Pandemic All-Hazards Preparedness Act (PAHPA) to ensure coordination between federal, state, and local health agencies (Gostin et al., 2014). Although these revisions were well

intentioned, they are ineffective without increased financial investments. Federal, state, and local public health agencies have all experienced sharp decreases in funding between 2008 and 2013 (Gursky & Bice, 2012; Gostin et al., 2014)—a $1 billion decrease for the CDC and a 20% decrease in state and local public health agency personnel throughout the United States (Gostin et al., 2014). In response to these budget cuts, some local public health agencies developed unique strategies depending on their capabilities and resources, such as increasing revenue, revising services, changes in staffing, leveraging political affiliations, and building partnerships (Prust et al., 2015). Other local public health agencies focused on how issues were prioritized to influence budget decisions (Jarris et al., 2012). From a federal perspective, research and funding were considered to be the primary challenges for addressing public health emergencies such as the Flint, Michigan, contaminated-water incident and the outbreak of the Zika virus (Miller, 2016). Without timely research and adequate funding, federal entities were unable to provide guidance or resources to local public health departments to strengthen the local response, which delayed both response and recovery from public health emergencies.

Studies acknowledging the importance of decision making and timely research and the lack of adequate funding among public health agencies without addressing the decision making process itself amplify this gap in knowledge, which is also present from a theoretical perspective. Decisions made by public health officials can strengthen the health system's ability to endure the complexities of a public health emergency (IOM, 2012). Conversely, decisions made by public health officials can also weaken the system when decisions are made with limited resources and other restraints (Gursky & Bice,

2012; IOM, 2012). Although decision making is only one aspect of what local public health departments must consider to prepare themselves for public health emergencies, the decisions that are made without having the necessary resources are critical to the success of the response (Gursky & Bice, 2012; IOM, 2012).

In this study, I focused on decision making processes used by local public health agencies after budget cuts. Public health emergencies such as the Ebola outbreak of 2014 and the Zika epidemic have demonstrated that local public health agencies are inadequately equipped to prepare for and respond to disease outbreaks due to reduced funding and uncertainty about the severity of impending or unknown disease outbreaks (Ferrer, 2016). This study was needed to bridge a gap in the public health body of knowledge and to underscore the importance of effective decision making in the early stages of an infectious disease, which can potentially save lives, reduce exposure, and prevent the spread of disease.

Problem Statement

Substantial funding cuts have weakened the ability of local health departments to identify and respond to public health threats in their communities (IOM, 2012; NACCHO, 2016). Between federal fiscal years 2005 and 2012, federal funding to state and local public health preparedness programs declined by approximately 38% (TFAH, 2012). Reports from the IOM (2012) and the National Association of County and City Health Officials (2015) indicate that the preponderance of state and local health departments nationwide depend on federal funding for essential public health service projects and public health preparedness activities. As many local public health

departments are underfunded, these decreases in financial resources may influence the decision making of public health officials, affect the capacity and capabilities of services, and increase vulnerability to public health emergencies, including naturally occurring or deliberate biological incidents (IOM, 2012). Because state and local public health departments and emergency management agencies are the cornerstone of preparedness and response efforts, it is imperative to understand how decreased funding influences decision making at the local level with respect to biological incidents (IOM, 2012).

Numerous studies have highlighted the shortfalls of funding and resources among local public health agencies. However, a review of the body of available literature shows that few researchers have explored this problem within the context of decision making and preparedness for complex conditions, such as a catastrophic biological incident. Despite concerns and heightened awareness regarding public health deficiencies, there are limited studies examining how local governments planned and prioritized scarce resources in the event of a catastrophic biological incident (Giblin, Schafer, & Burruss, 2009). An understanding and awareness of this activity is imperative as local public health agencies have a responsibility to contain and prevent the spread of infectious disease in the communities in which they serve (IOM, 2012; NACCHO, 2016). I used the limited-rational-choice theory (Lindblom, 1959) to explore how public health officials at the local jurisdictional levels of the mid-Atlantic state Department of Health make decisions when resources are limited. Decisions made by public health leaders may be assumed by the general public to have been made logically and rationally. However, the outcome of the decision may not always reflect this rationality from the viewpoint of

affected communities, especially after the Ebola scare and the water contamination incident in Flint, Michigan (Annas, 2016; Baum, Bartram, & Hrudey, 2016; Goldman, Kumanyika, & Shah, 2016; Gostin, 2016). The application of the limited-rational-choice theory will facilitate the exploration of how public health officials engage in decision making during periods of scarce fiscal resources and contribute to an understanding of the decision making process when resources are constrained.

Purpose of the Study

The purpose of this qualitative case study was to understand the decision making processes of public health officials at the local jurisdictional levels of the mid-Atlantic state Department of Health during austere funding environments with decreased federal public health funding. The primary aim of this study was to explore the decision making processes that affected the allocation of resources to include staffing, training, and planning initiatives devoted to public health initiatives for emergency preparedness. In addition, an objective of this study was to understand how public health officials at local health districts in the mid-Atlantic state Department of Health make preparedness decisions, factors that may influence and limit their decision making, how those decisions affect programs, and the implications these decisions may have on the organization and the community.

Research Questions

The primary research question guiding this study was: How do mid-Atlantic local health districts use limited-rational-choice theory to make decisions related to public

health emergency preparedness during austere fiscal conditions? Using limited-rational-choice theory as a guide, the secondary questions were as follows:

- Considering feasibility and acceptance by stakeholders, how do participants select objectives for decision making?
- How does the availability of resources affect the development of or choice of planning objectives?
- What elements of the decision making process are explained to stakeholders?
- How are unknown or missing elements of information acknowledged in the decision making process?
- Does the decision making process encourage unique courses of action or minimal changes to current plans?
- How are risks and benefits of each course of action analyzed?

Framework

The theoretical framework used in this study was Lindblom's (1959) limited-rational-choice theory (LRCT). LRCT explains how organizations are likely to make decisions when resources are limited. LRCT is derived from rational-choice theory. LRCT says that although decision makers attempt to consider all possible alternatives when making organizational decisions (Wandling, 2011), they are often constrained by limited information, resources, alternatives, and individual disagreement about goals (Blanchette, 2012). In other words, Alternative A may be the best choice but financially unattainable. However, Alternative B, even though less desirable, may be more feasible.

When this occurs, the outcomes or consequences of the decisions made may not be as effective as they would have been otherwise.

LRCT manifests limitations in various ways. For instance, LRCT also contends that decision makers will select alternative solutions that are closely related to each other, causing the outcomes to vary only slightly from one another. Because the alternatives chosen are similar to each other, a variety of alternatives may not be considered (Lindblom, 1959). In other words, each alternative is the same decision with a small detail that differentiates it from the others. This gives decision makers the illusion that there is a wide range of choices, when in reality there are only a few alternatives presented. This can happen when the ideal alternative is not presented as an option because it is believed it will be rejected based on its feasibility. If alternatives are generated based on limited resources or information, they will likely be chosen without considering that better options exist. In the case of public health, if wide ranges of alternatives are not considered, then possible outcomes affecting potential policies and other organizational values such as the obligation to protect public health may also not be considered. Limited rational choice was used to test whether funding decreases affect the decision making process through the use of interviews that incorporate LRCT concepts.

LRCT has been successfully used in previous qualitative studies on education to explain how decisions are made when physical space is limited (Blanchette, 2012). It has also been used to explain how decisions are made to discontinue academic programs due to decreased funding in higher education institutions (Eckel, 2002). I adapted the methodology and design used by Eckel (2002) and Blanchette (2012) in this study to

investigate and explain how decisions are made in mid-Atlantic local public health districts when resources and funding are limited.

The goal of this study was to find out how decision making occurs after funding cuts. LRCT was chosen because it outlined a framework that helped to understand the factors affecting decision making when there is financial strain, limited information on emerging disease, political pressure, and personal preferences among health care leaders. Normative and prescriptive decision theories focus on modeling and the accuracy of decision making, which does not address the complexities of limited resources, was not a focus of this study, and would not answer the research question. The research question matrix illustrated how the research questions are related to the framework for this study.

Semi structured face-to-face interviews were conducted to collect data for this study. The participant answered open-ended questions related to how the budget affects decision making and the processes that were used to make budget- and program-related decisions. The data collected from the interviews were assigned a thematic category based on their relation to the theory, effectiveness and efficiency, and themes that were identified and developed in the literature review. Data analyses included documentation review, transcription and interpretation of the interviews, and thematic analysis.

Data were managed using NVivo 12. The data were organized by interview, by research question, by themes that emerged from the literature review, and then aligned with the theory. Data was analyzed using a six-phase thematic-analysis process.

Nature of the Study

Based on the funding challenges described in the problem statement, the area of interest in this study were the decision making processes used by local public health officials at local health districts in the mid-Atlantic state Department of Health, both before and after budget cuts. The research design and approach for this study was a qualitative design, with a case study methodology. Chapter 3 describes in greater detail the research design and methodology. Yin (2016) and Patton (2015) have suggested that qualitative research is normally used when direct discourse is required to gain insights from individuals who have experienced the phenomenon of interest and can offer rich context from their own experiences. As individual experiences were the intended focus of the qualitative facet of the study, data collection via case study interviews was considered a practical approach in amassing and truly exploring the essence and genuine experiences of participants in the projected study.

According to Yin (2016), case studies are a research tool designed to facilitate explanations of why and how phenomena occur and the range of their effects and relationships. The case study design provides a means to explore, in depth, an event, program, action, a person or persons, or a practice (Patton, 2015; Yin, 2016). In addition, case studies are much more multipurpose in comparison with other qualitative research traditions (Patton, 2015; Yin, 2016). Case study designs use various techniques to include documents, observations, audiovisual material, or interviews (Patton, 2015; Yin, 2016). In this study, I used interviews because they permitted the participant to share his or her observations and interpretation of an issue from his or her own perspective. Moreover,

interviews are an affluent source of information and are beneficial in exploring a situation when evidence is not easily collected through observations (Patton, 2015).

Definitions

Biological incident: Occurs when a contagious or noncontagious biological pathogen infects humans or animals and is transmissible to humans through natural occurrence or by weaponized or terroristic means (FEMA, 2016).

Catastrophic biological incident: A natural or humanmade incident, including terrorism, involving microbiological organisms or biologically derived toxins that results in extraordinary levels of mass casualties or disruption severely affecting the population, infrastructure, environment, economy, national morale, and government function (NSTC, 2013).

Decision making: A problem-solving process that involves (a) identifying and defining a problem, (b) determining alternative solutions, (c) determining criteria to evaluate alternatives, (d) evaluating the alternatives, and (e) choosing an alternative (Anderson et al, 2015).

Infectious disease: A disease caused by pathogenic microorganisms such as bacteria, viruses, parasites, or fungi; the disease can be spread, directly or indirectly, from one person to another.

Rationality: The selection of alternatives through a system of values that allows individuals to make decisions and to make evaluations on potential and actual consequences of behavior (or actions; Secchi, 2011).

Assumptions

This study was based on the assumption that the mid-Atlantic state local public health districts lacked the resources to prepare for the complexities of a potential contagious and deadly disease outbreak, whether man-made or naturally occurring, and do not have sufficient resources or manpower to respond above and beyond their existing day-to-day capabilities. Considering these deficiencies in resources, mid-Atlantic Department of Health officials may find difficulty making decisions about preparing for uncertain disease outbreaks. I also assumed that mid-Atlantic local health districts were reactive rather than proactive on conducting formal decision making activities for outbreaks that have occurred elsewhere but not yet affected their location. I assumed that mid-Atlantic local health districts understand the critical role of decision making to prevent the unnecessary spread of disease and have a genuine moral desire to prevent a catastrophic outbreak; however, there may be internal and external factors that impede the rational decision making process. The effective initial response of mid-Atlantic local health districts is paramount in the prevention of the spread of deadly diseases and is the first single point of failure if proper decision making does not occur in a timely manner. Finally, I presumed that the participants would answer the questions truthfully and without fear, however considering that the researcher is a federal public health employee whose presence would possibly influence their answers to the research questions. Effort was made to establish rapport with the participants to mitigate this concern. This helped make it clear to them that their answers would not be shared for any professional purposes or gain.

Scope and Delimitations

This research was focused on the mid-Atlantic local health districts that operate under the mid-Atlantic state Department of Health's Office of Emergency Preparedness and Response and are located and operated in each county. Other departments may be involved with infectious disease preparedness and response decisions, but the primary responsibility for dealing with public health emergencies in the mid-Atlantic state lies with the Office of Emergency Preparedness and Response. One organization is a sufficient unit of analysis and was appropriate for this case study. Furthermore, previous research studies have used one case study as well as multiple cases to explore preparedness activities for infectious disease-related topics. Local-level public health districts in the mid-Atlantic were asked to participate in this study and were chosen based on (a) having a population of 200,000 or more residents, (b) seeing a decrease in public health funding between 2011 and 2013, and (c) proximity to an international airport.

The focus on decision making was chosen because it is an important part of disaster planning for infectious disease, and it has not been adequately researched. For every decision made, a potentially negative or positive consequence exists. However, for some public health agencies, these decisions can be more complex when the funding needed to support certain health and safety decisions is unavailable. This qualitative case study could be relevant in other contexts with organizations or local governments that rely on external funding sources to make decisions on complex issues that concern the general public.

Limitations

The limiting factor of this study is that only one case was studied, although one unit of analysis for a case study is considered reasonable. This was challenging because the participant was reluctant to release or discuss financial information that would have helped to understand the affect of funding cuts on decision making. Publicly published financial data was used to address this challenge. The study was also limited in scope as only one local health district in one state was researched, and it was constrained to decision making related to preparedness efforts aimed at minimizing the spread of an infectious disease outbreak. The findings of this study may not be relevant to agencies that are seeking knowledge related to decision making in public health that have not incurred budget cuts that caused alternative decision making techniques.

Significance

This research provided an in-depth understanding of the factors that influence the readiness decisions that are necessary to prepare mid-Atlantic local public health districts for efficient public health responses. Decisions regarding actions that need to be taken to prevent illness and death resulting from public health emergencies should be made long before an incident occurs. For example, research has found that the United States was not prepared for a biological incident after the Ebola cases surfaced in the United States in 2014 (Koltun 2015; TFAH, 2015). Perhaps this incident could have been avoided if there had been a better understanding of how preparedness decisions were being made at that time.

Understanding the importance of effective decision making in public health organizations will help public health administrators and policymakers understand the implications of decreased funding and help them identify potential gaps in public health preparedness. Because limited-rational-choice theory is concerned with the consideration of limited options—in this case, limited funding—the participating mid-Atlantic local public health district was asked during the face-to-face interviews how limited resources affected decision making. This study, therefore, may also help mid-Atlantic local public health districts maximize existing resources and identify potential cost savings. The results of this mid-Atlantic local public health district study are intended to provide potential decision making strategies for public health initiatives that other local public health agencies could model. The implications for social change are that critical decision making can be improved in advance of outbreaks and that the potential spread of disease may be contained or halted at the local level before the outbreak has had the opportunity to spread and cause economic and social disruption and panic in the community.

Summary

Decision making involving allocation of resources is a critical part of planning for public health emergencies in local government agencies. For a variety of reasons, local governments throughout the United States have been ill prepared to properly handle outbreaks of infectious disease. The mid-Atlantic Department of Health cannot expect consistent funding year to year from state resources, nor can it expect funding to trickle down from the federal government in a timely manner, even if it would be in the best interest of the affected community. For example, requests from the White House to

Congress for funding to fight the spread of Zika took 8 months (Fox, 2016). In this period, the Zika virus spread to 25,000 people (Leonard, 2016). With future uncertainty in the economic climate of federal-government allocations to state governments, and state governments to local governments, it is imperative that mid-Atlantic public health districts make decisions that will reduce or halt the spread of disease regardless of funding shortages before an outbreak occurs. Exploring how mid-Atlantic public health districts make decisions after budgets cuts will reveal best practices and opportunities for improvement so that county-level agencies in the mid-Atlantic state and other locations will understand and can better prepare for the next potential outbreak.

In Chapter 2, I focus on literature pertaining to public health and decision making processes and factors that affect both. Because minimal literature exists on local public health decision making, I also explored processes that aid in decision making, such as prioritization, coping mechanisms, and funding,.

Chapter 2: Literature Review

Introduction

My purpose in the literature review was to discuss prior research related to decreased funding and decision making that affect local public health agencies. I focused the literature search on decision making theories and techniques used in organizations to highlight how decisions have typically been made and resources prioritized after organizational budget decreases. SAGE Premier and ProQuest was used to retrieve the majority of the literature. The literature review is presented in three sections. The first section is a discussion of the strategies used to locate relevant literature. In the second section, I provide information about limited rational choice theory. In the second section, I provide a background of public health, and an overview and analysis of the research that has been conducted on decision making in public health agencies using both theoretical and non-theoretical methods. This section also includes a discussion about state and local governments in the United States concerning their core functions, how they are funded, and the funding challenges that affect public health preparedness. The fourth section is a discussion of decision making processes and factors that enhance and hinder them. I conclude the chapter with the notion that public health leaders should place emphasis on the information collection or research process to make effective decisions. Placing emphasis on information collection and research requires resources such as funding for personnel dedicated to research, planning, and training. Decreased funding is a direct threat to public health agencies ability to prepare for the uncertainties of emerging infectious diseases.

State health agencies are responsible for public health decision making regardless of funding constraints (Leider et al., 2013; Prust et al., 2015), and little empirical evidence demonstrates how state health officials are addressing decision making after funding shortages have occurred (Leider et al., 2013). Attempts have been made in public health to address decision making after budget cuts through the process of priority setting, the development of coping strategies, and allocation of resources. Current literature has indicated that funding for public health initiatives is inadequate at all levels of government, which is likely to have an affect on organizational decision making.

Literature Research Strategy

There is no shortage of studies on decision making or budget cuts in public health, however, empirical studies that focus specifically on decision making processes after budget cuts in local public health agencies are scarce. Because insufficient public health decision making process literature is available, the literature search was expanded to include studies that focused on decision making and infectious disease preparedness to provide additional insight about the funding issues and other shortfalls in resources that preclude public health agencies from being able to function properly during a public health emergency. This insight was the basis for the research question, because the literature review failed to identify literature specifically addressing the decision making processes used to make critical preparedness and response decision after funding cuts.

I began the literature search with a focus on infectious-disease-related issues in United States local public health agencies that were found in research studies, peer-reviewed journals, and from articles published primarily in literature focused on public

administration and public health. Based on topics found in the initial search to have an affect on local public health agencies, another literature search was conducted with the same databases, to focus on those issues, which were governmental funding, decreased funding, and decision making in public health at the federal, state, and local levels of government. The Walden University Library and Google Scholar were the primary search engines. Other electronic databases accessed were federal, state, and local government public health websites, including the mid-Atlantic states Department of Health website.

The literature was accessed through SAGE Premier, Google Scholar, ProQuest Central, and a mobile device application tool called Article Search. Key words and phrases used for the literature search included *public health, decision making, public health government funding, emergency management funding, biological attack, infectious disease outbreak, decision making in emergency management, law enforcement funding cuts, decision making in law enforcement, education funding cuts, decision making in education, decision making in public health, federal budget cuts, federal budget cuts to state agencies, state budget cuts, local budget cuts in public health, decision making theory, organizational decision making, state public health, politics and public health,* and *decision making in government.*

In the absence of empirical studies that explore decision making after funding shortfalls in public health agencies, I expanded the literature search to include governmental publications by organizations that have had similar experiences. In addition to public health agencies, literature on resource constrained local government agencies that rely on federal and/or state funding from to carry out public health obligations has

also been reviewed. Although I found no studies specifically addressed the processes of post budget cut decision making in local public health agencies, some studies addressed certain aspects of decision making, such as affects, prioritization, coping strategies, and allocation of resources. These studies acknowledged that the challenges arising as a result of budget cuts are in need of attention; however, the studies did not consider a broader understanding of the larger decision making processes that lead to specific courses of actions being taken.

Theoretical Foundation

Limited Rational Choice Theory was developed by Charles Lindblom (1959) and was proposed to be a better, more realistic model than rational choice theory. Rational choice theory is a decision making theory that contends that decision-makers will research all alternatives, develop courses of action that reflect a wide range of logical choices, and then choose the most rational choice with the expectation that the most logical rational decision will be agreed upon before finalizing the choice or taking action (Secchi, 2011). LRCT contends that organizational decision-makers would only generate and consider alternatives that were similar to normal business practices or were within their range of feasible options. Also referred to as incremental decision making, through limited rational choice, Lindblom (1959) argued that organizations would logically choose limited or constrained alternatives and consider them in a prioritized manner. Decisions were considered logical possibly because they were made based the knowledge and available resources on hand at the time. The question then was, do public health agencies conduct thorough research to aid in decision making? Are courses of action

based on research or feasibility? Is there a validated decision making process that is consistent, and if so what is it? To gain a deeper understanding of decision making in public health agencies, there is a need for empirical studies to be conducted at the local level to answer these types of questions. Table 1 gives a hypothetical example of a decision point and how rational choice and limited rational choice would be applied to the same decision and produce different outcomes. Decisions made with a LRCT are more likely to be undesirable, delayed, or canceled.

Table 1

Rational Choice versus Limited Rational Choice

Decision point	Rational choice theory	Limited rational choice theory
Develop a local level Ebola response plan that addresses personal protective equipment (PPE) and distribution.	1. Develop creative objectives that are thought to be able to solve the problem and align with agency policies and values. 2. Plan/policy is formulated and the resources to implement are acquired. 3. The decision making trail can prove that this was the most appropriate decision to make. 4. Comprehensive analysis, all alternatives were considered valid. 5. Theory is heavily used.	1. Only develop objectives that are thought to be feasible and are likely to be agreed upon. 2. Plan is formulated based on limited objectives, but resources to implement the plan are uncertain. 3. Decision making trail can explain why the decision was made, but not necessarily the "best" decision. 4. Analysis includes what limited information was known at the time the decision was made, acknowledging that there are elements missing (policy, funding, etc.) 5. Limited or no use of theory to compare alternatives.

LRTC was chosen for this study because when it is applied to a decision objective, it can help explain where likely errors in the decision making process are made and was the most appropriate theory to explore and learn about how the mid-Atlantic local health districts make preparedness decisions after budget cuts. Because much of the mid-Atlantic local health districts funding for public health is allocated by state and federal funding mechanisms, their ability to make decisions based on empirical research, and generate a wide range of options would be severely affected by budget cuts.

There were five studies referenced here to demonstrate the successful utility of LRTC. In the first study, Eckel (2002) used LRCT to explore how decisions were made to discontinue academic programs due to decreased funding in higher education institutions. The second study was conducted by Blanchette (2012), adapted Eckel's (2002) research design, and was focused on how decisions were made about limited physical campus space. The third study was conducted by Armstrong and Kenyon (2015), and used LRTC to explain why women's options concerning childbirth were limited by uncontrollable and unpredictable circumstances despite their best efforts to plan a natural birth. The fourth study was conducted by Pasha, Poister, and Edwards (2015), and used LRCT to examine how local public transportation agencies made decisions about progressing into the future. The fifth and final study was conducted by Bekemeier, Chen, Kawakyu, and Yang (2013), and used LRCT to investigate factors that influenced decision making for local public health resource allocation in Washington State. Unlike

the public health research studies that acknowledged the importance of decision making under financial constraints, the studies by Eckel (2002) and Blanchette (2012) sought to apply theory, and uncover the actual decision making *processes* used by decision-makers after budget cuts.

Some studies incorporated LRCT with other theoretical frameworks. For example, Eckel (2002) adopted a dual framework from LRCT to gain an in-depth understanding of the decision making criteria, and to test the action rationality and decision rationality framework. Decision rationality is focused on choosing the right alternative regardless of whether or not it yields action, and action rationality is focused on making decisions that will garner support for taking action (Brunson, 1982, as cited in Eckel, 2002). These frameworks were generated from LRCT, and were articulated by Ashar & Shapiro's (1990) research that "there is a relationship between information, criteria, and decision outcomes" (as cited in Eckel, 2002). In other words, the information collected is used to develop, inform, and establish criteria that will affect the decisions being made. The question in public health decision making would be, *has decision criterion been used to influence decision making?* Eckel (2002) took this idea a step further by comparing the established criteria to a final decision made to close certain university programs and found that the final decisions were based on action rationality rather than decision rationality.

Adapting Eckel's methodology, Blanchette used LRCT to explore how decisions were made about physical space by higher education institutions. Like Eckel's study, the theory was beneficial because it acknowledged that the range of available options would

be limited by the scarcity of physical space and academic program termination and could be viewed theoretically through limited rationality. However, to further conceptualize the study, Blanchette (2012) also incorporated Pure Rational Choice along with procedural rationality, decision rationality, and action rationality constructs. For example, after it was determined that the decision on how space would be allocated was highly political (limited rational choice), the decision was further viewed in terms of whether or not the political decision was influenced by the decision to produce results (action rationality), biases, uncertainty, and unreliable information (bounded rationality), or a combination limited information and bounded rationality (procedural rationality). Applying LRCT along with other rational choice theory to this study to learn how decisions are made at mid-Atlantic local health districts will provide insight on how decision making theory enhances knowledge of the relationship between theory and practice in public health.

Armstrong and Kenyon (2015) successfully used the concept of limited choice to explain the extent to which maternity patients have a choice in their healthcare, and sought to participate in the decision making process concerning their healthcare. Although the logic of choice concept appears to be different from LRCT by name, the application to research is consistent with the way LRCT has been used in previous studies. For example, Armstrong and Kenyon's study explored whether or not the logic of care (limited rational choice) interferes with the logic of choice (rational choice) (p. 3). Under logic of choice, the patients have conducted their own research using evidence-based guidance, and developed a birth plan that is tailored to their preferences and inclusive of all options available to them. However logic of care has little regard for the

desires of the birth plan and shifts to the level of care that is limited to the options will produce a safe delivery for the mother and child. One of the first signs that LRCT is at play is *delayed progress* when applied to administrative functions, and *delayed labor* is the first sign that logic of care is implemented as it concerns childbirth. Findings revealed that the decisions made by the childbearing women in the study had to be revisited when their wide range of options were found to be limited by unforeseeable clinical factors that developed over the course of their labor. This maternity example shows how LRCT can be applied to decisions in a variety of settings to explain how a limitation of options can impede, delay, or alter decision making.

Pasha, Poister, and Edwards (2015) study was focused on 236 United States local transit agencies and attempted to prove quantitatively, that prospector organizations use logical incrementalism (also known as LRCT) whereas defender organizations use formal strategic planning (also known as rational choice theory). Prospector refers to transit agencies that are innovative and opportunistic, and defender refers to transit agencies that are more conservative and protective of their mission and resources. Separate sets of statements were developed to identify whether or not the agencies were a prospector or defender and whether or they used LRCT or rational choice. The participants rated each statement using Likert Scale measurement. The results concluded that prospector and defender organizations use both processes to formulate their strategy planning, therefore the hypothesis could not be supported.

Bekemeier, Chen, Kawakyu, and Yang (2013) used LRCT to investigate factors that influenced decision making for local public health resource allocation in Washington

State. This study was conducted using qualitative interview strategies with quantitative methods for data collection and analysis. The use of limited rational choice or any other theory to test the assumptions were vaguely described in this study, however, it could be inferred that local public health agencies in Washington State made decisions based on imposed constraints. This study explored those constraints to determine how heavily each constraint weighed on final decision making. The use of LRCT highlighted the constraints to decision making, but stopped there without further analysis to learn the "why" behind each decision. Bekemeier et al's (2013) study noted that there were discrepancies in the literature descriptions between what should and what actually influences decision making in public health practice. Using LRCT with other theories of rational choice may have explained the reasons behind those discrepancies had they been explored further. In the previous studies discussed, the subordinate theories of rational choice (action, procedural, and bounded) helped to further explain why specific final decisions are chosen over others that may have also appeared resolve the issue being decided upon.

This study explored how decision making occurs and adapted in the same manner as Eckel (2002) and Blanchette's (2010) studies by using the case study method with public health officials to explore decision making processes used after a massive budget cut, and applying limited rational choice to understand how these choices and decisions are made. Further understanding of the decision making process was viewed from another perspective in this study by applying action rationality and procedural rationality. Based on the literature, the assumption was made that decision making was constrained

based on budget cuts, and that among the decisions made, choices were made to either take action quickly (action rationality) or make the decisions that made the most logical sense based on an analysis of available information, even if the information was believed to be incomplete (procedural rationality).

Public Health Decision making Studies

A review of the literature related to decision making after budget cuts in public health revealed a limited amount of studies, which mostly acknowledged the challenges caused by budget cuts and the need for enhanced decision making. There were several studies conducted that used theories other than LRCT, or no theory at all to explore decision making after budget cuts. In a study conducted by Prust et. al (2015), Jarris's research was expounded upon by employing qualitative research using the constant comparative method to develop a constructivist grounded theory to determine how local public health agencies in Connecticut coped with budget reductions. Like Jarris et. al's (2012) research, Prust et. al's research did not explore decision making frameworks or theories that would enhance the body of literature on public health decision making, rather, the focus was more on financial coping strategies. Both studies discussed constraints on decision making that were experienced by state and local health agencies. The key discussion missing from both studies surround the decision process, decision framework, or theory that could have been or was used to aid in decision making when funding was reduced. The development of priorities and coping strategies are important, but how are competing priorities decided upon when resources are limited? In fact, there was no literature found related to this study that discussed a specific theoretically based

decision making process used in local government when funding is decreased. Additional studies used in this research highlighted the need for further scholarship in local public health agencies by discussing the affects on services that the communities in which they serve depend upon.

With the public health system being consistently underfunded nation-wide (TFAH, 2014), it has become imperative that individual local public health agencies strengthen decision making capabilities to consider courses of action when operating on limited funding (Frist 2002; Gursky and Bice 2012). The courses of action that are generated when deciding on the most appropriate decision to make should include considerations for limitations that will hinder the execution of the decisions being made. There was evidence from the literature that decision theories or frameworks, such as Evidence Informed Decision Making (EIDM) (Ward, 2013) are used in public health, but are not used to aid in decision making after budget cuts. The concept of EIDM is closely related to Rational Choice Theory.

Acknowledging the need for empirical research in public health, Ward (2013) addressed the decision making process by developing a nine-step evidence based framework to inform EIDM. EIDM applies research to public health practice to encourage public health decision-makers to consider scholarly literature and credible research to aid decision making. Although this method to aid in decision making was optimistic, the challenge of using EIDM is the significant financial resources needed to implement the process Ward (2013). Also, there is a certain level of uncertainty that exists in public health concerning infectious disease. EIDM shares similarities with

Rational Choice Theory in that they both assume that consideration will be made for all available information to be used and analyzed to make the best decision. Unlike EIDM or Rational Choice Theory, LRTC would factor limitations into the decision making process.

As Ward (2013) confirmed in a study about EIDM, generating an exhaustive research-based list of options to aid in decision making would be expensive in an environment where financial resources are already constrained. Therefore, the assumption is that mid-Atlantic local health districts do not consider an exhaustive list of options when making decisions, but only consider or discuss options that are within their capabilities. To ascertain the validity of this assumption, participants in this study will be asked to describe in detail a specific decision that had to be made based on budget cuts. To further understand the extent to which decision are made, they will be asked if decisions are made as a group, or by individuals, and how much and the types of research that are involved in the decision making process.

Decision-makers would then have to determine how to operate on the decreased budget, and continue with public health responsibilities. To explain the applicability of LRCT, participants are asked questions about their decision making process to determine if they in fact only brainstormed a limited range options to address the funding shortages that were constrained by what they were only capable of doing at the time, or if they generated creative alternatives without regard for their financial deficit.

Several studies have been conducted without the use of a theoretical construct. For example, Jarris et. al (2012) noted in their mixed-methods study about public health

decision making in times of scarcity, that there is a lack of information concerning decision making after budget cuts. The study further acknowledged that the interaction between priority-setting processes, politics, and budget gaps should be examined further to create theoretically based decision support and evidence based tools (p. 391). Although this study discussed the importance of theoretical strategies to aid in the decision making, there is no specific suggested or implied theory or framework provided to build upon.

State and Local Public Health

To better understand the issue, the following discussion provides the background and purpose of public health at the state and local levels, starting with the core function of public health at state and local levels. Following the core function discussion, it is important to understand how state and local public health agencies are funded, how funding decreases occur, and the potential consequences of those actions. The next section will discuss the history of pandemics and biological threats in mid-Atlantic states that shaped the delivery of their programs, as well as a discussion on the potential affects that early decision making can have on the local governments ability to prepare for emerging incidents. The final section is a discussion on several aspects of decision making and factors that potentially influence decisions.

Core Function

Local health departments in each state have the complex responsibility of providing a wide range of public health services to the communities they serve based on population, urban or rural demographics, economic structure, and within the boundaries of their own governmental structure (Gebbie, Rosenstock, & Hernandez, 2003). Because they serve different populations, the priorities that are developed by each health department are focused on issues that affect, or have the potential to affect their local communities. Although priorities for local health departments throughout the United States may differ, core functions for most locations typically include adult and childhood immunizations, infectious disease control, community outreach and education, epidemiology and surveillance, food safety services and restaurant inspections, and tuberculosis testing (Gebbie, Rosenstock, & Hernandez, 2003). The area of most concern for this study was the infectious disease control core function because disease spread may be unpredictable, have high adverse affect, and have the potential to spread quickly throughout the country and the world. The mid-Atlantic Department of Health strategic plan for 2014-16 acknowledged the need for greater emphasis on emerging infectious disease, but also cited that decreased and consistent levels in funding, in addition to increasing costs and legislative mandates adversely affect their ability to assess, prepare for, and respond to emerging infectious disease.

Public Health Funding Sources in State and Local Governments

Recommendations drawn from the literature suggest that a baseline should be established for public health and medical funding to address future funding issues

(Schlegelmilch, Petkova, and Redlener, 2015; TFAH, 2014). This suggestion does not address what would happen if costs were to exceed the established baseline in any given year, nor do these findings consider recommending the use of decision making strategies to manage decreased funding. Other recommendations drawn from the literature related to decision making were the prioritization and restructuring of health programs and funding new business models that promote efficiency in processes (TFAH, 2014). The answer to the problem when addressing decreased funding is not always to "increase funding."

Local government public health funding is heavily dependent upon funding from the federal government. On average, 45% of state public health funding throughout the United States is provided by the federal government through grant programs, congressional authorizations and appropriations from the CDC (CDC, 2013). Generally, health departments can be state led with shared local authority, or local government led with shared state authority depending on the amount of financial support provided by the state (ASTHO, 2014). The mid-Atlantic state Department of Health (DoH) is structured uniquely and has established as a system of statewide local health districts to address the needs of city and rural communities (Lake, 2004). The cities and counties that already had functioning public health systems prior to the establishment of the statewide system received financial incentives to affiliate with the statewide system (Lake, 2004). In recent years, the mid-Atlantic state DoH received as much as 50% of it's funding from federal sources (Romero, 2014). Because all counties and cities in the mid-Atlantic state have financial affiliations with the state, any budgetary federal cuts to the states would

negatively affect the local public health agencies, unless they were able to make up the loss through local fundraising initiatives such as tax increases, or increases in fees and fines.

Funded by the US Department of Health and Human Services (HHS), state and local public health departments rely heavily on the Public Health Emergency Preparedness (PHEP) cooperative agreement and the Hospital Preparedness Program (HPP) grant to provide significant funding for their health and medical preparedness programs (Schlegelmilch, Petkova, & Redlener, 2015). Since 2004, funding to state and local governments through the HPP grant program has been reduced from more than $500 million in 2004 to approximately $250 million in 2015 (p. 114). Funding to state and local governments through the PHEP programs were reduced from more than $900 million in 2005 to approximately $600 million in 2015 (p. 115).

Mid-Atlantic state Department of Health and districts they support may not have sufficient funding streams to successfully respond to biological incidents without the assistance of federal government. Through the sole use of federal funds, the mid-Atlantic state was able to establish a hospital preparedness program after 9/11 and the bioterrorism scare in 2001, subsequently testing this program with three false alarms during the Ebola scare (Smith, 2014b). It is unclear what would happen to this program if federal funding were further reduced or cut.

To better understand how state health directors' deal with budget cuts, Prust et al. (2015) conducted a study with local health directors in the state of Connecticut. This mixed-method study used a qualitative research method to gather the data, and a

quantitative constant comparative method to analyze the data collected from 17 local health directors (Prust et al., 2015). The findings suggest that local health jurisdictions in Connecticut developed varying coping strategies to address the constraints that hindered their decision making (Prust et al., 2015). Although the study identified constraints, the decision making process, and the decisions that were made, there were no elaborations on the decision making process itself. This study was important because it highlighted the problem of budget cuts in public health and offered a perspective that recognized constraints, however there was no in depth discussion or explanation of how any decision making process was used.

Sometimes an understanding of the situation can be found in creating new and innovative ways to work within the budget, or develop new partnerships with other members of the community that are willing and have the capability to provide the needed resources. These are decisions that should be considered in the absence of adequate or desired funding levels to minimize the potential consequences of budget cuts.

Leider et al. (2013) conducted a mixed-methods study to examine how state public health officials prioritize resource allocations after significant budget cuts. This study received survey input from 207 eligible public health leaders throughout 6 states and found that the manner in which each agency prioritized resources were varied due to a number of reasons including political and statutory differences (p. 4). This empirical study was focused on quantitative factors that affected decision making. The application of a decision making theory in Leider et al.'s study would have been useful to help understand the relationship between the factors that were identified as having an affect on

final decisions. Leider et al. (2013) recommended that further studies should be conducted in public health to establish the need for evidence-based priority setting. However, it can be argued that a good decision making process needs to be implemented before priorities can be properly identified.

Decreased State and Local Government Funding

Amid an economic recession in fiscal year 2012, U.S. States experienced budgets cuts of $55 billion throughout 31 states, adversely affecting health and education (Oliff, Mai, & Palacios, 2012). In years 2010 and 2011, the shortfalls were $130 billion and $107 billion respectively (Oliff, Mai, & Palacios, 2012). Factors that have contributed to the budgets cuts include but are not limited to decreased federal aid, states' inability to increase revenue, and poor tax collections (Oliff, Mai, & Palacios, 2012; Williams, Leachman, & Johnson, 2011). In fiscal year 2013, the mid-Atlantic state faced a $145 million budget shortfall, which they were able to address and close before the budget was adopted (Oliff, Mai, & Palacios, 2012). However, in the same fiscal year (FY13), allocations toward public health funding decreased by a little less than $1 million, and were down by $7.8 million the prior fiscal year (FY12) for a total decrease of $8.7 million between fiscal years 2011 and 2013. In a study conducted by Leider et al. (2013) results reflected that of the 6 participant states, 54% of their revenue was received from federal funding, followed by 19% from State grant funds, 11% through fees and fines, 8% through Medicaid/Medicare, and the remaining 8% through other State/Territorial and miscellaneous sources. Because federal government funds make up more that 50% of the state budget, shortfalls have a negative affect on the services that state and local governments are able to provide to citizens. The decisions made by state officials to address these shortfalls have the power to adversely affect the economy (by increasing taxes, eliminating jobs, or reducing services, etc.) whether they close the gap or not.

The local economy was affected because one-third of federal non-defense discretionary spending is allocated to state and local governments for public health, education, law enforcement, and many other state run services (Oliff, Mai, & Palacios, 2012). Most states supplement public health program funding with discretionary funds, which means that they are at risk of being cut in an economic downturn (TFAH, 2014). If revenue is not increased through tax collection or other strategies, then budget shortfalls may be passed down to the receiving agency, in this case local public health officials, who will inherit the daunting task of determining which programs to maintain, decrease funds for, or discontinue. Arguing the importance of public health investments can be challenging because raising funds can have political implications for state health officials who are in appointed positions (Jarris et al., 2012). However in states where the director is not in an elected position, the state health directors work closely with political officials to find ways to raise funds through their partnerships (Prust et al., 2015). Political implications add yet another layer of constraints to an already complex decision making process.

Many state public health leaders indicated that they operate in a political environment where the final decisions that were made were out of their control (Jarris et al., 2012). If these leaders felt that decision making was out of their control, how likely would they be to engage in formal decision making? The answer is "very likely. As Jarris et al. (2012) highlighted in the following study, state health officials were able to use the decision making process to formulate sound recommendations to help communicate the public health needs of the community to politicians.

Jarris et al. (2012) conducted a mixed method study to gain an understanding of the budget and priority-setting process used by local governments after budgets cuts. The study used semi-structured interviews with 45 senior leaders in 6 state health agencies, a web-based survey of senior leaders from all 50 states in which 207 responses were received. From these interviews, weighted priority setting criteria were developed to create decision support tools to help bridge the gap between public health science and political realities (p. 391). There is agreement between some researchers that priority-setting after budget cuts is critical to the decision making process public health (Prust et al., 2015; Leider et al. 2013; Jarris et at. 2012). However, other researchers findings suggest that emphasis was placed on the factors that influenced decision making such as local government statutory requirements and political priorities, rather than public health agency priorities (Prust et al., 2015).

Consequences of budget cuts

Federal budget cuts that are passed on to state and local governments, coupled with a state's potential challenges of generating additional funding, can translate to difficulties that are further passed on to local public health agencies as they attempt to make decisions about how they will manage existing programs, personnel, and services amid budget cuts. In an effort to balance the budget, public health agencies may lay off employees, cancel contract services, limit services to non-profit agencies, cut benefits to individuals (Oliff, Mai, & Palacios, 2012), and neglect health and safety programs. Other indirectly related consequences of state budget cuts include elevated unemployment rates, and decreased real estate prices, which affect the tax base (Prust et al., 2015).

Despite the fact that public health funding sources have decreased, alternatives have been constrained, and the process politicized in some cases, (Prust et al., 2015, Leider et al., 2013; Jarris, et al., 2012), there have been few empirical studies that focus on how local public health agencies make decisions to accommodate public health programs after funding cuts. Studies that address the issue of funding cuts in public health have approached the topic from a wide range of perspectives that include prioritizing public health initiatives, increasing revenue, cutting programs and personnel, and addressing political challenges (Prust et al., 2015; Leider et al., 2013; Jarris, et al., 2012). Perhaps the most relatable perspective to LRCT is that of prioritizing. However the prioritizing described in these studies was focused on prioritization of factors that influence decision making without an explanation of the actual decision making process. Jarris et al., (2012) conducted interviews with state health agency leaders and generated a list of public health budget priority-setting criteria to be used for decision making. Each criterion was then applied to categories such as "mission critical", or "important" to determine whether or not it should be funded or cut (Jarris et al., 2012). Another example of prioritization used for decision making was the development of foundational capabilities used by several states to prioritize funding streams (TFAH, 2016). This list of capabilities would be prioritized based on what services would be linked to funding, what services required further legislature, and what services could be provided by state, or local health departments. In the absence of a standard of decision making process that is applicable to public health agencies, scholars and practitioners have recognized the need

for enhanced decision making during budgetary uncertainty, but have yet to publicly identify specific processes to strengthen decision making.

Disaster Pandemic and Threat

Pandemics

A biological hazard for the purpose of this study is bacteria, virus, or any substance that can cause harm in humans. A few historical examples of biological events that have affected the United States were the Pandemic Influenza of 1918 that killed 675,000 Americans (Healthline, 2016; Daffin, 2012), the Asian flu in 1957 that killed 70,000 (Noah & Noah, 2013), diphtheria in the 1920's that killed more than 15,000 (Healthline, 2016), and polio that killed more than 3,000 people (Healthline, 2016). There have been more recent outbreaks such as the measles in the 1980's, contaminated water in Milwaukee in 1993, and Flint Michigan in 2014, and pertussis in the 2010 and 2014 (Healthline, 2016). Finally the HIV/AIDS epidemic that has plagued the United States since the 1980's and is ongoing (Healthline, 2016). All of the outbreaks occurred without warning and are unique in their own ways, which challenge and test the preparedness of the local public health systems throughout the United States.

International disease outbreaks such as Ebola, MERS-CoV, and SARS have compounded the degree of uncertainty already present in public health agencies. International disease outbreaks are of concern in the U.S. because infected persons may travel from other countries undetected and unknowingly spread disease. Such was the situation in the case of Eric Duncan, who returned to the U.S., went through the screening

procedures, then presented to a hospital where he infected two nurses with Ebola before he died (Annas, 2016; Smith, 2014). Detection and screening protocols are in place at some international airports, including several international airports, but if a person is asymptomatic at the time of travel, the disease may not be detected.

Biological Threat

A biological attack is an intentional use of a virus, bacteria, or any other substance that is weaponized and meant to kill or harm people. The most prominent difference between a public health pandemic response and a biological attack response, is the lead time in which public health and hospitals have time to prepare and respond. An attack is unanticipated, sudden, and little may be known about the substance or pathogen that was used in the attack, which makes planning complex and treatment uncertain. Resources would need to be allocated to conduct training mass casualty exercises to anticipate this type of attack to increase preparedness. Resources would also need to be invested in research and intelligence, to determine how biological pathogens could be weaponized and used by terrorists in mid-Atlantic states.

The anthrax scare in 2001, which occurred on the heels of 9/11 revealed deficiencies with the response and collaboration efforts between the federal government, state government, and the CDC (Hsu, 2005). Detection systems used by the federal government were not accessible to the state, CDC, and the U.S. Postal Service (USPS), which caused a delay in their ability to respond appropriately to protect the public (Hsu, 2005). This is a clear indication that the state had not invested in their own system of biohazard detection by the time this scare took place, and relied on the federal

government. By the year 2006, through the CDC's Public Health Emergency Preparedness (PHEP) agreement, $1 billion was allocated to states to prepare for public health emergencies, but had been cut down to $585 by 2013 (Vestal, 2014). Likewise, the Hospital Preparedness Program (HPP) administered by the Department of Health and Human Services (DHHS) allocated $515 million to states to prepare healthcare workers for infectious disease outbreaks, terrorist attacks, and other emergencies. By 2013, this funding had been reduced to $255 million (Vestal, 2014).

Although the precise location and risk of a bioterror attack is unknown and could be considered a low probability occurrence, the affect of one occurrence may be devastating if local authorities are not prepared to respond appropriately. The probability of a hurricane, flooding, or even the flu may place higher on a local government officials list of financials priorities, and is understandable. However, new technology and political strife abroad and stateside seems to be fueling terroristic opportunities, therefore the chance of a bioterror attack should not be overlooked.

The Federal Bureau of Investigation (FBI) has actively collaborated with the Do-it-Yourself (DIYbio) network to prevent biosecurity risks and establish a safe network (Tocchetti & Aguiton, 2015). The DIYbio is a network of biotechnology enthusiasts sharing laboratory ideas for hand-made experiments (Tocchetti & Aguiton, 2015). The concern is that this Internet network is open to anyone who wants to use it, including those who intend to use it for terroristic or criminal activity. Through this DIYbio community, the FBI was able to observe Al-Qaeda's interest in bioweapons, and a journalist who successfully purchased a DNA fragment of smallpox (Tocchetti &

Aguiton, 2015). Although smallpox is not a public health threat, it is a potential bioterror threat (Graeden, Fielding, Steinhouse, & Rubin, 2015). The U.S. has stockpiled a large quantity of smallpox vaccine, however there is great uncertainty regarding the process of administering the vaccine through the local governments and into the community in the event of an outbreak (Graeden, Fielding, Steinhouse, & Rubin, 2015). Because there has never been an outbreak or terroristic smallpox attack to test the process, and the administration of public health processes and resources vary from state to state, it is unknown what specific affects that decreased funding allocations for preparedness would have on a real-life response.

Public Health Preparedness and Response

The mid-Atlantic state has not suffered a disease epidemic since the 1980's, however assuming that resources should be decreased or not allocated could prove to be a mistake and lead to the public health agencies failure to control disease outbreaks or respond appropriately to a mass biological attack. After antibiotics and sulfa drugs had been discovered which curbed many infectious diseases in the 1930's and 1940's, the mid-Atlantic state faced a polio epidemic in the 1950's that made national news (Clay & Bangs, 2005). It was at this time in 1950 that the mid-Atlantic DoH was designated as the lead agency for Emergency Medical services in time of disaster (Lake, 2004). Shortly thereafter in 1954, legislation was passed which created a partnership between state and local public health. When a polio vaccine was developed, state and local officials thought they had overcome infectious diseases, therefore decreased public health investments for preparedness (Clay & Bangs, 2005). When the next public health epidemic happened, the

mid-Atlantic state and local public health agencies were not prepared. This decrease in public health investments contributed to the local government being ill-prepared to handle the next epidemic, which was AIDS in the 1980's resulting in more approximately 8,300 deaths (Lake, 2004). The epidemic status of AIDS ended in the early 2000's as a result of new medical treatments. There is no public evidence that any state and local public health agencies employed any decisions or laws that contributed to the slowing down the transmission of AIDS.

The mid-Atlantic state is lagging behind other states when it comes to the development of general public health laws that address preparedness for infectious disease outbreaks. Based on lessons learned after the 2009 H1N1 influenza pandemic and other public health issues created by recent natural disasters, the IOM recommended that state and local governments update their laws to allow public health agencies to better address the complex and emerging issues that come with infectious disease (Rutkow et al., 2014). The mid-Atlantic state was one of 14 states that had not addressed laws that would affect the public health workforces willingness or ability to respond to a PHE such as, (a) ability to declare public health emergency, (b) requirements for public health emergency plan, and (c) priority access to health resources for responders (Rutkow et al., 2014). Not only does the state have funding challenges, there are also legal and programmatic challenges that could possibly be a result of limited funding and political strife. If funding was not available to hire more healthcare professionals for a public health disaster, the existing workforce may be expected to handle the workload. Without laws in place, or decisions made to ensure the protection of the workforce, healthcare

professionals could decide not to respond beyond the expectations of their normal duties, which would further complicate a public health disaster response.

Decision Making

People make a wide range of decisions every day, whether personally or professionally. Although budget decisions are not typically based on personal preferences, sometimes personal preferences have some level of influence on professional decisions. Kelman, Sanders, and Pandit (2016) asserted that individual cognitive limitations may hinder the consideration of all relevant information, and individual cognitive bias can hinder information gathering and analysis, including in fiscally constrained environments. The suggestion is not that decision-makers handle budgets solely based on their biases, however in a collaborative environment where budget decisions are difficult and must be agreed to by other stakeholders, the biases of those ultimately responsible for the final decision could be swayed to vote one way or another based on reasons such as personal preference or past experience. Decisions may be also based on a variety of factors including budget, uniformity, function, purpose, company policy, and maybe even group consensus. Because this discussion is concerned with financial limitations on decision making in local public health agencies, the focus was on organizational decision making. Secchi (2011) defined decision making as a rational process that includes three types of decisions, (a) mechanical, (b) decisions that imply choice, and (c) creative.

The method that government organizations use to make decisions can vary greatly based on many factors, to include leadership direction, politics, policy and legislation,

resources, organizational culture, and budget. To best understand the complexities of organizational decision making, we must first understand how the basic types of decisions are applied. Mechanical decision making implies that decisions are routine and made without any thought, usually repetitive in nature (Secchi 2011). Organizational decisions that occur routinely based on historical activities fall into the mechanical decision category, such as allocating funds to departments within the organization based on the budget from previous years.

Non-mechanical decisions imply that there was a choice to be made before any action was taken (Secchi 2011). Organizational decisions that involve the analysis of several options fall into the non-mechanical category. Slight budget decreases or changes in program needs in an organization may cause leaders to have to choose different amounts for their departments based on funding availability.

Creative decisions imply that serious thought was applied and different alternatives were considered before a final decision was made (Secchi 2011). Organizations must use creative forms of decision making when millions of dollars have been cut from their budget and the decisions that need to be made to sustain the agency become more complicated. Agencies must decide on courses of action such as reducing services, laying off personnel, eliminating programs, or find creative ways to raise revenue. The process used to make these, and other difficult decisions are considered crucial. In times of public health emergencies, there may not be time for creative decision making during a crisis.

Ideally, decision making for worst-case scenarios resulting in crisis should be brainstormed during the normal planning process instead of deliberately waiting until "something" happens. There may be little time for creativity during a public health crisis. A crisis is "a threat that is perceived to require an urgent response under conditions of deep uncertainty" (Rosenthal, Charles, & Hart, 1989). Public health emergencies resulting from infectious disease outbreaks may have uncertain outcomes and consequences, requiring consultation from subject matter experts. Considering antibiotics, vaccines, and other medical countermeasures which may or may not be available depending on the specific disease, the timeliness of dispensing medications will be critical in a crisis situation and may make the difference between life or death. Investing in research for infectious disease to consider the latest information available about threats also involves collaborating with other agencies or entities, such as law enforcement and educational research facilities. Public health officials should be held ethically and morally responsible for decision making that occurs before and after a crisis, because these decisions will likely have an affect on many people, to include public health workers. This does not mean that if all the "right" decisions are made that all outcomes will be desirable, it just means that significant effort was made to predict all possible outcomes based on the knowledge that was available at the time of analysis to minimize loss of life and further spread of infectious disease.

Situational awareness refers to "knowing what's going on" and is considered a critical component of decision making as it concerns controlling infectious disease outbreaks (Curran, 2015). Decision-makers are disadvantaged when information from

local healthcare services is either not passed on, or the potential threat goes undetected. This may cause delays or denial of requests to the state or federal government for financial assistance if decision-makers are unprepared to articulate or provide substantial justifications of why increased funding is necessary. Curran (2017) identified in a study about human judgement errors during man-made disasters, that management was relying on communication from local agencies to inform if there was an impending outbreak. If there was no communication, then it was perceived that there was no outbreak (p. 4). If local outbreak detection mechanisms are weak, the situation may be undetected and thereby not communicated, resulting in failure or delay of the leadership decision making process. Timeliness of disease reporting has an effect on access to resources, is crucial to disease control (Eshofonie, 2016), and essential to situational awareness.

Although most of the literature in this study emphasized various components of decision making including prioritizing and criteria-setting, there were alternative views concerning how local government public health agencies should operate after budget cuts. Skertich, Johnson, and Comfort (2012) examined constraints on local governments ability and responsibility to provide public safety and public health services in the Commonwealth of Pennsylvania and recommended that cooperation and collaboration should be increased with other agencies to continue to provide the same basic services with a decreased budget. The problem with this recommendation is that each collaborating agency has their mission and priorities and may be dealing with the same issues of decreased federal funding, which ultimately has a negative affect on personnel, programs, and other resources. If cooperation and collaboration was to occur, it should

happen in the early stages of planning or decision making, where priorities are decided along with the stakeholders. As in the case of an infectious disease, agencies should exercise caution when collaborating functions as not to violate human rights. Annas (2016) argued that public health and public safety became convoluted after the Ebola scare because lawmakers took a military approach to a public health issue by attempting to enforce quarantine on healthcare staff. This problem could have been avoided if proper research and decision making that focused on population health and scientific evidence rather than national security would have been conducted (Annas, 2016; Jacobs, Jones, Gabella, Spring, & Brownson, 2012).

Decision making Processes

Bouwmeester (2013) described rationality as decisions that are "based on reasons worth acting upon" (p. 416). The rational model of decision making under normal circumstance would include (a) defined objectives and priorities, (b) information collection, (c) evaluation, comparison, and ranking of alternatives, (d) cost-benefit analysis, (e) affect on community, (f) policy evaluation, (g) analysis of theoretical perspectives, and (h) a thorough evaluation of complex issues (Lindblom, 1959). This means that defining the objectives and priorities would entail clarifying the process and summarizing the end goal that the decision is expected to attain. A rational decision should be consistent with the decision that was made. Because rationality has a strong affect on decision quality, the process used to make the rational decision should be highly detailed (Bouwmeester, 2013).

One example from the rational model would be information collection and would encompass gathering all data available pertaining to the decision being made to ensure decisions are being made with the most accurate and current data, tools, and science. When the objectives have been defined and the information is collected, then the courses of action to achieve the objective can be developed. The courses of action would be developed as distinct alternatives that can be prioritized, ranked, and analyzed using cost benefit analysis, while also determining the affect to the community for each alternative or course of action. There would also need to be an evaluation of those courses of action against organizational and possibly governmental policies to avoid breaking laws or support the laws. The analysis of theoretical perspectives and evaluation of complex issues would be somehow incorporated into information collection and course of analysis phase of decision making. At the end of the process, a logical or rational decision based on a structured decision making is expected to emerge. This process would be ideal, assuming that organizations have the time, resources, personnel, and expertise to follow through. So how does decision making occur for organizations that lack the necessary funding to follow the ideal components of rational decision making?

Evaluation, comparison, and ranking of alternatives appeared to be a popular activity among public health decision-makers and researchers. The study on budget and criteria setting conducted by Jarris et al. (2013) developed criteria by ranking priorities including magnitude of the problem, financing, mission critical, and cost effectiveness. If the same criteria in this were applied to a biological threat that has not happened, and there is no evidence that the threat is eminent, decision-makers may not be eager to re-

align funds from other active public health programs to support hypothetical preparedness scenarios. Taking the criteria study a step further, Leider et al. (2013) set out to determine which public health leadership positions were involved in the decision making process and asked them to rank the criteria developed in Jarris et al.'s (2013) study from "extremely important" to "not important". The leaders ranked mission critical, seriousness of the consequences, financing, external directives, magnitude of the problem, and prevention potential in the top 6 of the 19 most important priorities to determine where resource allocations should be made. Having public health leaders rank the priorities to determine where budget emphasis should be placed seems to be a more promising method for calculating priorities than just developing a list of criteria alone. This leadership ranked list of priorities would help to articulate why certain decisions were made to stakeholders not directly involved in the decision making process.

Components of Rational Decision Making

Action rationality. Action Rationality is concerned with the desire to make decisions based on what is expected to be supported, rather than sound research and judgment derived from the rational choice process (Eckel, 2002). If decision-makers are simply focused on taking action, they may not have the information needed to anticipate unintended consequences that could lead to worse conditions than they started with. This is different from limited rational choice in that limited rational choice acknowledges a shortfall in knowledge or resources needed to make the best decision possible. Action rationality process does not include an analysis of the situation to determine shortfalls, but rather simply produce results and hope for the best. For example, when the Federal

Emergency Management Agency (FEMA) supplied emergency residential trailers to disaster victims, the goal was to act quickly and speed up the recovery process for families already suffering economic hardship (Spokane, Mori, & Martinez, 2012). Only later was it discovered that the trailers were emitting dangerous formaldehyde gases (Rhodes, 2010). It is not publicly known how much research in terms of exploring available options and weighing consequences was put into the decision making process behind supplying the trailers. For action rationality, the order of logic is different than with rational choice or limited rational choice. The goal of action rationality is to develop alternatives that lead to actions, and will be supported by stakeholders (Eckel, 2002). In a budget deficit, it is possible that decisions are made to "take action" with only limited resources and information, rather than the best information available, which could be beyond the range of available resources.

Action rationality at play in a local public health agency would likely cause public health planners to only present courses of action in the plan development process that their leadership or decision-makers would agree on, even if they have knowledge that a better course of action exists. The withholding of more favorable courses of action could be due to short timelines or tight deadlines where action is needed and funding is running out on a certain date. Another possibility is the planning teams past experience with similar situations, therefore the teams makes their own prediction of what will or will not be accepted by their leaders.

Bounded rationality. When decision-makers are influenced by their biases, circumstances, competing priorities, and uncertainty, rather than reliable information,

they are considered to be affected by bounded rationality (Smith, 2014). It is difficult to ascertain the magnitude at which an emerging infectious disease will affect a community. This causes public health officials to be bounded by uncertainty in their decision making efforts. An example of bounded rationality's effect on decision making in local public health was the Flint Michigan water crisis and the Zika response efforts. Both of these situations were public health emergencies that brought about great uncertainty which were not planned for and required a massive amount of resources, including research and funding, to aid senior leader decision making (Miller et al., 2016). Without funding, or timely and reliable information, public health officials may struggle to make decisions that are in the best interest of the community. A consistent decision making process that acknowledges the need for research would help reduce bias's present in bounded rationality. Individual decision-makers may have varying levels of information available to them and will therefore be bounded by different decisions as a result (Pelikan, 2010). Extending this logic to the organizational level, local agencies within the same state may have access to different levels of information when there is no standard information collection or decision making process, and as a result they are bounded by different decisions. If local health districts and other municipalities within the same state use different methods and processes to address funding shortages, it could be explained by bounded rationality. For example, a decision-maker in local health district may want funds diverted away from pandemic influenza funding into other programs to prepare for a smallpox epidemic. This desire could be based on decision-makers in charge of the smallpox planning's knowledge of what could likely happen, versus another decision-

makers knowledge of what has actually happened in previous years. In this example, decision-makers are biased by their prior or current knowledge, competing priorities, uncertainty in how and if they will be affected, and would be thereby influenced by bounded rationality.

Procedural rationality. Procedural rationality is the process of collecting and analyzing information, and selecting the best alternatives despite having incomplete information and having bounded rationality to make decisions (Dean & Sharfman, 1996; Ford & Gioia, 2000; Blanchette, 2010). The rationality lies within the thought process used to make and support the decision in lieu of complete information. In terms of using procedural rationality when funding in decreased, the issue of lack of funding could be built into the information collection and development of courses of action to choose the best alternatives. The difference between limited rationality and procedural rationality is that the latter is focused on thought processes that lead to decisions, although the former encompasses the lack of quality of the alternatives generated during the decision making process. In other words, there isn't enough information on alternative "A" so we will not consider it in the decision process. For example, a procedural decision was made to quarantine a nurse that had cared for a patient infected with Ebola (Miles, 2015). The decision was based on medical knowledge believed to be true at that particular time coupled with fear resulting from biases formulated because of the media coverage. A limited rational decision process may have dismissed the idea of quarantine because there were too many unknowns, rendering a slightly different outcome from the mandatory and unwanted quarantine. It can be deduced that if there is no formal decision making process

in place, limited rationality is more likely to be applied. An example of the use of procedural rationality would be when a healthcare facility is presented with patients infected with an unknown, highly infectious disease with a high mortality rate that has been claiming the lives of 1 in 4 patients. The disease has not responded to any medications that have been used on the patients. The healthcare facility will likely send blood and tissue samples to local laboratories for testing, alert the CDC that an infectious disease may be on the horizon, and possibly convene a workgroup to develop a plan to combat this new disease to include initial development of new vaccines. In the meantime, the healthcare community must continue to treat patients using the personal protective equipment and other conventional methods they have on hand. They will continue to make the most logical decisions they can concerning the life safety, and treatment and care of patients based on the information they have, knowing that they have incomplete information.

Evidence-Based Decision Making

In theory, evidence-based strategies should be a commonly used approach to decision making within public health (Jacobs, Jones, Gabella, Spring, & Brownson, 2012; Brownson, Gurney, & Land, 1999), regardless of funding situations. Evidence-based public health (EBPH) involves the use of many tools to include qualitative and quantitative peer-reviewed information to aid in decision making by public health practitioners (Jacobs, Jones, Gabella, Spring, & Brownson, 2012). The idea behind evidence-based decision making is that public health leaders will use all information and tools available to them to generate courses of action to make the best decision possible in

the interest of public health. This is similar to the concept of rational choice theory that was argued against by Lindblom (1959) and McCaughey & Bruning (2010), who asserted that a wide range of options, even if the best option were found, would be constrained by certain limitations. In other words, decision-makers may arrive at the "best" decision and still be unable to fund it, which would be a significant constraint.

The disconnect between funding and research for public health emergencies was underscored by Miller et al. (2016) in their study about the integration of research into disaster response. As evidenced by the response to Ebola, the Flint Michigan water crisis, and Zika, there is a significant lag between the time it takes to research the situation, apply for a disaster grant, and the time it takes for federal decision-makers to allocate funding (p. 4). In the meantime, local public health agencies must continue to find ways to minimize the spread of disease with the resources they have. The level of uncertainty posed by infectious diseases leaves public health agencies and decision-makers unable to act quickly. Having a decision making protocol in place prior to a public health emergency would help to fill the gap as research is being conducted and additional funding is being decided.

If decision-makers acknowledge funding shortages during the information collection and analysis phase of planning, then decisions would be made based on those constraints. This would resemble the concept of procedural rationality, rather than evidence based. In the case of public health decision making, some of the constraints previously identified in the literature were funding, policy, politics, and several others constraints depending on location, with the common variable being funding decreases.

Furthermore, decisions are constrained by the individual thought process of the person or people making the decision regardless of what evidence is available to them (McCaughey & Bruning, 2010). Although evidence-based decision making provides the strategy in which to gather the necessary data for decision making, there is little evidence that this strategy is sufficient when funding has been severely cut. Challenges of supporting evidence-based decision making are funding, time, as support systems (Meagher-Stewart et al., 2012).

Public health officials may also find themselves in a position where decisions need to be made, however the options that have been considered are beyond limitations of available resources, therefore decisions are made that meet the most basic criteria instead the best decision possible, this is another example of bounded rationality (McCaughey, 2010). The difference between bounded rationality and limited rationality is that the former assumes decision-makers have gathered all of the information necessary to make the best decision, whereas limited rationality acknowledges a lack of complete information that results in limited options being generated.

Politics of Decision Making

Politics and public policy were common themes repeated in the literature that had heavy influence on decision making and are often in competition with theories of rational choice. Political leaders and policy makers tend to make decisions based on what will satisfy the public, rather than rational theories that include intensive information collection or evidence-based information (McCaughey & Bruning, 2012). Choosing political reasoning to address public health issues instead of science diminishes the

public's trust in government (Annas, 2016; Ulrich, 2016). Using the Ebola scare in 2013 as an example, lack of evidenced-based information and failure to conduct assessments led to decisions that generated unnecessary fear in the community that hampered disease control efforts. Costly decisions such as those made in the Ebola example inadvertently divert funds away from programs that public health subject matter experts may find more important.

Differing perspectives between political and public health leaders cause conflicts as it concerns generating funds and funding allocations in public health. General public opinions that political leaders respond to may be completely different or in direct conflict with what the evidence from subject matter experts have collected. These conflicts cause political leaders and subject matters experts to end up "talking past each other", which will further complicate decision making (Smith, 2014a). On the other hand, a research study by Prust (2015) revealed that local public health agencies used political influence and relationships to secure funding for areas that had previously experienced funding cuts. Blanchette (2012) found that competition over scarce resources can become a highly influential decision making process with profound effects on individuals and groups. Understanding the extent of political influence of decision making on local public health agencies will advance the growth of these agencies in responding in times of economic downturn.

Summary and Conclusions

LRCT was successfully used in several organizational settings to explain how limited resources can affect decision making. Even though the limiting factor varied in each organizational setting, evaluating the decision process from the perspective of LRCT helps to identify the limiting factor and evaluate its affect on the final decision. The literature review highlighted key findings concerning decision making in those organizations that have a bearing on this study. These findings include: (a) effective decision making in advance of the uncertainties stemming from pandemics or biological terror events can help ease the burden of response when and if an incident occurs, and (b) decision making processes should include thorough research of all the issues that could affect final outcomes, if not, leaders are at risk of making poor decisions, wasting resources, delayed requests for federal assistance, and the risk of unnecessary loss of life. Lack of sufficient funding further complicates an already complex situation.

Although other fields of study have identified the relevance or need for efficient decision making, there have been limited empirical studies that have explored specific decision making processes that can be further tested or utilized in the fields reviewed, including the public health field. Components of decision making such as situational awareness, and priority-setting were studied, however a clear picture of how those components affect a theoretical model of decision making was not evident in the literature. Evidence based public health decision making was found be used in practice, however there was no decision making process identified to compliment the concept.

A common theme found in the literature concerning decision making after budget cuts or limited resources was political interference. This study explored how public health agencies make decisions, and applied these concepts to a theoretical model of decision making that can possibly help pre-identify what factors are impeding and what may be helping organizational decision making.

To explore how local public health agencies make decisions, Chapter 3 provides the methodology regarding the process that was used to answer the research question and fill the gap on the missing literature related to decision making with limited resources in local public health agencies.

Chapter 3: Research Method

Introduction

The purpose of this qualitative case study was to understand the decision making processes of public health officials at local jurisdictional levels of the mid-Atlantic state Department of Health, during austere funding environments with decreased federal public health funding. The primary aim of this study was to explore the decision making processes that affect the allocation of resources to include staffing, training, and planning initiatives devoted to public health initiatives for emergency preparedness. In addition, an objective of this study was to understand how public health officials at local health jurisdictions of the mid-Atlantic Department of Health (DoH) make preparedness decisions, the factors that may influence and limit their decision making, how those decisions affect programs, and the implications these decisions may have had on the organization and the community. To better understand how decision making occurred, seven organizations under the direction of DoH were invited to participate in this study, but only one organization was chosen for the final study. These invited organizations were (a) Health District One, (b) Health District Two, (c) Health District Three, (d) Health District Four, (e) Health District Five, (f) Health District Six, and (g) Health District Seven. The total number of individuals interviewed should have been approximately nine to 15. In this chapter, I provide details of the research method that I used for this study, which includes the research design and rationale, role of the researcher, methodology, and issues of trustworthiness.

Research Design and Rationale

The purpose of this study was to explore how local public health districts in mid-Atlantic states made decisions regarding the control of infectious disease after their budgets were cut. Research questions were designed to be general, broad, and open-ended, which is consistent with qualitative research. The primary research question guiding this study is: How do mid-Atlantic local health districts use limited-rational-choice theory to make decisions related to public health emergency preparedness during austere fiscal conditions? Using limited-rational-choice theory as a guide, secondary questions were as follows:

- Considering feasibility and acceptance by stakeholders, how do participants select objectives for decision making?
- How does the availability of resources affect the development of or choice of planning objectives?
- What elements of the decision making process are explained to stakeholders?
- How are unknown elements of information that is unknown or missing acknowledged in the decision making process?
- Does the decision making process encourage unique courses of action or minimal changes to current plans?
- How are risks and benefits of each course of action analyzed?

A case study strategy helped to understand how public health districts within the mid-Atlantic DoH made decisions regarding public health preparedness for infectious

disease outbreaks after their budgets have been substantially curtailed. Each mid-Atlantic local health district contains multiple program offices that collaborate on decision making where it concerns public health emergency response resources, so this was therefore considered one case. The program offices asked to participate in this study are listed in the next paragraph. The case study method was applied to this topic because it was considered one of the most logical qualitative techniques for discovering and developing an in-depth awareness of real-life decision making processes (Patton, 2015; Yin, 2016). Case studies help illuminate and describe the process and effects of a phenomenon through a comprehensive method incorporating observations, the collection of information, and the use of facts and data to reconstruct and frame situations to facilitate exploration of the cases being studied (Patton, 2015; Yin, 2016).

Correspondingly, case studies afford empirical analyses of a phenomenon in its real-world setting, particularly when the margins between the phenomenon and the situation are not clearly apparent (Patton, 2015; Yin, 2016). The case study approach also provides opportunities to collect data from multiple participants as well as documents to analyze and understand decision making organizations and the barriers they encounter throughout the decision making process. Because the aim of this study was to understand how mid-Atlantic local health districts make decisions after budget cuts, the case study approach facilitated face-to-face interviews, observations, and the review of relevant documents to gain insights from those responsible for decision making in the agency in their natural setting (Patton, 2015; Yin, 2016). The grounded-theory, phenomenological, narrative approach and ethnographic qualitative techniques were not deemed appropriate

to this research because the intent of this study was not to facilitate the development of a theory, discover the essence of an experience, describe a culture, or capture and record the life experiences of an individual or specific individuals.

The mid-Atlantic DoH, with its multijurisdictional system, was selected for this research because it was necessary to study a health district that had been disproportionally affected by budget cuts to better understand how it had made decisions after a funding decrease. According to the mid-Atlantic DoH strategic plan (2016), half of the department's annual budget depends on federal funding, and this funding is expected to decrease. Thus, it is reasonable to consider this action would likely limit the ability of various local health districts in the mid-Atlantic DoH system to adequately prepare for and respond to public health hazards. Decision making in the Office of Public Health and Preparedness program, Office of Emergency Preparedness program, Office of Epidemiology, Office of Financial Management, and the Office of Risk Communication and Education programs were explored by reviewing their input to collaborative plans that highlighted their level of preparedness and shortfalls. In addition, interviews were conducted with various decision-makers to gain an understanding of their approach to managing challenges in making decisions with limited funding. The aforementioned programs named were purposefully selected to explore and illustrate similarities and differences in perspective of decision making between the programs. These programs were selected because they are directly involved with the development of public health emergency preparedness and response plans and may be adversely affected by funding decreases.

Potential participants for this study were located through a search of the mid-Atlantic DoH website where an organizational chart was found. Most of the position titles are listed except for the specific titles of the positions in the Office of Financial Management, which will be included when this information becomes available. The position titles were chosen because they are agency, department, or program office leads as well as financial professionals who would likely be involved in the decision making process. The specific positions desired for interviews are as follows:

- Chief Deputy Commissioner.
- Office of Financial Management.
- District Director.
- Operations Director, Public Health & Preparedness.
- Business Manager, Public Health & Preparedness.
- Director, Office of Emergency Preparedness.
- Business Manager, Office of Emergency Preparedness.
- Director, Office of Risk Communication and Education.
- Risk Communication Manager.
- Director, Office of Epidemiology.
- Deputy Director, Office of Epidemiology.
- Director, Division of Disease Prevention.
- Public Health Training Coordinator.
- Director of Strategic Evaluation and Planning.

First-hand knowledge from key decision-makers provided the best insight possible to address the research questions. This approach is supported by decision making literature because all of the decision making literature referenced in this study collected data from managers and other key leaders in decision making positions. As demonstrated in the literature review, budgetary studies often use case study strategies to investigate funding decisions.

Role of the Researcher

The researcher's role was primarily to facilitate data collection and to conduct analysis of the collected data. As suggested by Patton (2015) and Yin (2014), the researcher served as a channel for the interactions between individuals who experience the phenomenon under exploration in this study. Accordingly, the researcher designed the semistructured interview questions, arranged meetings to conduct the interviews, assembled with interviewees to administer the interview instrument, and observed the interviewees during the collection of the data via interviews. Furthermore, as the designer of this study, the researcher developed assumptions, established delimitations and identified limitations for the study, and analyzed, interpreted, and presented the results of the study. Patton (2015) and Yin (2014) have suggested that qualitative research encompassing case studies with interviews are subject to researcher and interviewee bias. To mitigate this effect, credibility, dependability, confirmability, and transferability were considered when validating the data. Also considered were influences such as prejudice and personal beliefs, which could bias the findings of the study (Patton, 2015). Efforts to mitigate this bias included the researcher's serving as a dynamic observer, listener, and

recorder; detecting patterns and validating all information to fashion a truthful depiction of the interviewee's point of view when summarizing findings; and averting concurrence or disagreement with study participants during the interview process (Patton, 2015).

Methodology

Mid-Atlantic Selection Logic

Of the states that have experienced dilemmas in decision making after budget cuts, the mid-Atlantic state was chosen as the location of the study based on a risk factor identified in their 2014-2016 strategic plan that would complicate an effective response due to a lack of preparedness. The mid-Atlantic DoH budget is heavily dependent upon federal funding; therefore, diminishing federal funds creates a challenge for decision-makers to respond to unpredictable public health threats and hazards (DoH, 2014). The report also indicates that the agency has a negative outlook on the stability of federal funding; therefore, the agency may be amenable to participating in a study of this nature to bring awareness to the seriousness of the situation. The state was also considered a good case to study because of its proximity to major international airports that have significant importance pertaining to the spread of diseases originating in other countries. Residents conducting personal- and business-related global travel have increased the local communities' exposure to diseases that are uncommon in the United States. (p. 34). The DoH Emergency Medical Service (EMS) must be prepared to respond to people living and traveling through the state and must also be responsible for the development of statewide capabilities (p. 18). A reduction of funding in this area would require

considerable and creative decision making strategies for the department to fulfill its mission when the time comes.

The mid-Atlantic DoH website was used to identify potential participants to recruit for this study. Invited to participate from county-level public health districts were operations directors, the director of risk communication and education, the director of emergency preparedness, the Office of Emergency Medical Services, and the director of epidemiology or their designees involved in the decision making processes affecting the programs being studied.

Because the nature of this study involved decisions that concern controlling disease outbreaks in densely populated areas, selection criteria for this study started with the recruitment of the top seven most populous counties in the mid-Atlantic state. In addition to population, their proximity to major international airports was also be a factor since outbreaks of international origin have been a concern in the United States. Finally, participants must have experienced affects to their operations or programs from budget cuts.

The number of participants interviewed in previous LRCT research has varied between studies. In a multisite case study, Blanchette (2012) interviewed six to nine participants per case. Eckel (2002) interviewed between 11 and 16 participants per site in a multisite case study. Bekemeier, Chen, Kawakyu, and Yang (2013), however, interviewed a total of 13 participants spread throughout 11 local health jurisdictions for a mixed-methods study. Although not clearly obvious from the literature, it appears that the variances could be due to the differences in the sizes of the decision making bodies along

with the differences in the chosen methodologies. Blanchette (2012) and Eckel (2013) both chose multisite case studies, likely because the cases were unrelated educational institutions experiencing the same phenomena. A single-case study is the logical choice for Bekemeier, Chen, Kawakyu, and Yang (2013) because the local health districts used in the study were interrelated as a system and operated under the same state health system. The intended sample size for this single-case study (nine to 15 participants) would have been consistent with the sample size of the mixed-methods case study conducted by Bekemeier, Chen, Kawakyu, and Yang (2013). Further details about recruitment and selection of the participants are outlined in the recruitment, participation, and data collection section of this study.

Instrumentation

The primary data-collection method for this single case study was semistructured face-to-face interviews, where one participant from a mid-Atlantic health district was asked mostly open-ended questions related to his or her decision making process and how the budget affects decision making. Data saturation commonly occurs around 12 participants (Guest, Bunce & Johnson, 2006) but possibly at 15 participants when they are in high-level positions (Latham, 2013). An interview protocol (Appendix A) was developed within the recommended limit of 12 questions by brainstorming questions that would be relevant to the study and would answer the overarching research questions (Miles & Huberman, 1994). It is also important to interview individuals who could provide the most knowledgeable answers to the interview questions, which is why members in leadership and decision making positions were selected for interviews.

Although the local health district was small, and there was only one authorized decision-maker, the decision-maker was the highest-ranking public health official and was able to provide a wealth of knowledge.

Decision-makers are hindered from choosing the best available decision because they are bounded by constraints, which fuels the theory of LRCT (Lindblom, 1959). The semi-structured and open-ended format of questioning allowed information to flow from the participant to reveal elements of the decision making process that were consistent or inconsistent with LRCT. The decision-maker was asked to give examples of how a limited budget affected decision making. Responses from the participant describing how he or she evaluates courses of action revealed whether or not LRCT was affecting the decision making process.

The use of technology such as video conference calls, e-mails, and online surveys to collect information is practical and convenient, but it cannot replace physical interaction with the subject, which allows the interviewer to read body language and facial expressions that could provide a nonverbal perspective and cues to the conversation. Also, online surveys may be an undue burden on the participant in having to write out a narrative response, when verbally articulating the response would be more effective. In addition to the data collected from the interviews, the intention was to review meeting minutes and documents supplied by the participants that contain information about the severity and affect of budget cuts; however, the participant did not consent to an agency document review.

As an optional alternative to a face-to-face interview, the participant was offered the opportunity to participate in a telephone interview. The participant preferred and agreed to a telephone interview and granted permission to record. A meeting was set up with the participant at a mutually agreeable time. The interview script and informed-consent letter were e-mailed to the participant prior to the start of the interview. The participant agreed to continue with the interview, with the exception of the agreement to release any agency documentation.

The methodology for this study was consistent with decision making research previously conducted and validated with sampling guidelines and strategy (Blanchette, 2010; Eckel, 2002) and aligned appropriately with the intent of this study to show how decision making occurs in a local government public health agency such as mid-Atlantic local public heath districts. The interview questions in Table 2 were developed to test LRCT.

Table 2

Interview Question and Theory Matrix

Interview questions	Limited rational choice theory
1. Considering feasibility and acceptance by stakeholders, how are objectives selected? (1)	1. Only develop objectives that are thought to be feasible and are likely to be agreed upon (Lindblom, 1957).
2. How does the availability of resources affect the development of, or choice of planning objectives? (2)	2. Plan is formulated based on limited objectives, but resources to implement the plan are uncertain (Lindblom, 1957).
3. What elements of the decision making process are explained to stakeholders? (3)	3. Decision making trail can explain why the decision was made, but not necessarily the "best" decision (Lindblom, 1957).
4. Whether formal or informal, please describe your decision making process? (1-5)	4. Analysis includes what limited information was known at the time the decision was made, acknowledging that there are elements missing (Lindblom, 1957). (policy, funding, etc.)
5. How are unknown or missing elements of information acknowledged in the decision making process? (4)	5. Courses of action are strikingly similar with only small variances between them. The risks of each course of action are not calculated. If a formal course of action comparison is used, then decisions are not made according to LRCT (Lindblom, 1957).
6. How are risks and benefits of each course of action developed and compared? (5)	

Recruitment, Participation, and Data Collection

First, the health district directors in each of the seven aforementioned counties named were e-mailed a letter of invitation to participate and a consent form. Within 1 week, one of the district directors replied that the mid-Atlantic DoH Institutional Review Board (IRB) process needed to be complete. Following the DoH IRB approval, the prior e-mails were re-sent along with the approval documentation to the district directors again. Of the seven districts invited to participate, only one accepted. Four district directors formally declined by e-mail, citing time constraints and shortage of personnel, and two district directors did not respond to the request.

The mid-Atlantic DoH operates 35 local health districts that are organized to cover its 95 counties. The counties with the highest populations (above 100,000) are more likely to participate in emergency-preparedness activities such as exercises and drills than those with smaller populations (NACCHO, 2013). This means that they may have some documented lessons learned that would reveal the anticipated needs of the community and what the shortfalls may be in the case of a biological event. There are 17 health districts in the mid-Atlantic DoH with populations of more than 100,000. Selection for participation in this case study was prioritized first by density of population, then by proximity to international airports, and finally by the degree to which the district had been negatively affected by budget cuts (as observed through online sources such as Trust for America's Health); furthermore, participants must have been involved in their agency's decision making process, either directly or indirectly. The negative affects of budget cuts are identified in districts' strategic plans and were further verified during the

initial request for participation and during the follow-up phone call. For the purposes of this study, direct involvement implies that the participant led, contributed to, or was physically present during the decision making process. Indirect involvement means that the participant was an active observer of the process, with knowledge of the process but no decision making authority. Participants needed to be able to articulate the decision making process on behalf of their agency. Open-source documents were relied on because agency documents would not be made available. This information included the publications of Trust for America's Health, which identify significant federal budget cuts passed along to state and local public health agencies. The goal of the document review was to identify where significant decreases had occurred to ascertain whether or not elevated levels of decision making had actually occurred. Districts that have experienced budgets cuts indicates that they may have had to make programmatic decisions based on the availability of funds. Online sources of state, county, and district specific public health budget data included (a) the mid-Atlantic Department of Health website, (b) the Trust for America's Health website, and (c) the mid-Atlantic Department of Health strategic plan. Unpublished budget-allocation data specific to the local health jurisdictions was requested but denied.

To remain consistent with sample sizes from similar case studies and literature, interviews were planned with management and executive-level decision-makers from at least three program areas. However, it was later learned that those positions do not make decisions at the local district level. Gathering and comparing perspectives from multiple programs that have experienced similar funding issues would have helped to corroborate

and validate the information provided related to decision making. The number of interviews necessary to provide depth of understanding in the data was dependent upon how rich the information collected from the individuals were. Although the goal to interview two to five people from each program area (Office of Public Health and Preparedness program, Office of Emergency Preparedness program, Office of Epidemiology, Office of Financial Management, and the Office of Risk Communication and Education) was unsuccessful, the information provided by the one public health official provided much needed and sufficient insight into the process.

A single interview was requested on their premises, not to exceed 1 hour per participant; however, the participant chose a telephone interview. The goal was to start and complete the data-collection process within a 30-day time frame, and this goal was met successfully. Data collection was considered complete when all the information collected became repetitive and no new information was being provided. To initiate the request, all potential participants were e-mailed information about the study, including the research questions. The telephone interview was recorded upon consent from the participants. The transcribed notes were sent to the participants so they would have the opportunity to validate them before analysis.

Ethical Procedures

Anticipated ethical concerns for this study revolved around consent and protection of privacy. The most common protections afforded to the participants included measures to protect confidentiality (Nachmias & Nachmias, 2008). To address these concerns, written consent was requested from the participants (Appendix B). The identity of the

participants would not be disclosed in the study without written consent. The organization as well as the participants had the option to be named in the study or to remain confidential. If the organization chose to remain confidential, all references to the state in which the study was conducted were removed. Any information such as professional titles, airport names, or regional terms that could potentially reveal the identity of the participants were redacted or given another name. The potential participants were informed of their right to refuse involvement or terminate their participation at any time during the study. In addition, the participants were informed how the information they provided would be used in the future. Data collected from research and interviews were kept on the researcher's personal computer, and the files were password-protected.

Data Analysis Plan

The data were analyzed using a six-phase process that included coding and thematic analysis: (a) familiarize and analyze the data, (b) generate initial codes, (c) search for themes, (d) review the themes, (e) define and name the themes, and (f) produce the report (Braun & Clark, 2006). Because this study was exploratory in nature, and there was little theoretical information available regarding the types of responses to be expected to the research questions, inductive coding was appropriate (Nachmias & Nachmias, 2007). However, responses to some questions were anticipated and could be deduced from the theory; these questions were themed accordingly. The inductive coding process in Phase 2 was applied by assigning a word or phrase to every three to five sentences of data collected from interviews and the document review (Saldana, 2016). to

organize codes and separate literature from participant input, words or phrases given by participants were enclosed in quotation marks. Coding and analysis was accomplished with NVivo 12.

The thematic-analysis process began in Phase 3 with a search for broad themes. This involved an analysis of the coded data sets to reflect on emerging patterns, which were categorized by interview questions, related topics, and ultimately assigned to overarching themes and subthemes. Each individual interview was transcribed and themed separately for data manageability. The intent was to identify relationships between concepts and ideas that may not be obvious. This process was repeated with each interviewee and a case study report was generated for each program area (Office of Public Health and Preparedness program, Office of Emergency Preparedness program, Office of Epidemiology, Office of Financial Management, and the Office of Risk Communication and Education). The goal was to understand how budget decrease affects decision making in each participant's department as well as the overall affect on public health emergency-preparedness programs.

Phase 4 began the process of reviewing and refining the themes to determine which topics were most significant and which did not add logic and value to the explanation of the analysis. This was also the time to make sure that the patterns were coherent and in alignment with the theory and research questions. Phase 5 entailed defining, refining, and naming the themes, where the content of each theme was described along with an explanation of why the details were important to the study and of any relationships that existed between themes. Subthemes were also refined and analyzed

in this phase, with a detailed narrative. The final analysis and narrative write-up was produced in Phase 6. This final write-up ultimately explains how decision making occurs, the affects of decision making concerning budget cuts on public health emergencies, and the existing relationships between theory and practice.

Issues of Trustworthiness

The issues of trustworthiness related to this study are credibility, transferability, dependability, and confirmability. The following sections address these areas in depth.

Credibility

In quantitative research, internal validity is achieved by demonstrating that the independent variable had an effect on the dependent variable (Nachmias & Nachmias, 2008). In qualitative research, credibility involves demonstrating that the results of the study are credible from the perspective of the participant and the reader. First, methodological validity will be achieved by making sure the research questions align well with the purpose, framework, and methodology. This researcher developed open-ended questions to solicit responses that would provide insight on the decision making process to accurately describe the process. Gathering data from multiple participants with multiple perspectives also enhances credibility and was a hallmark of this case study design. Other strategies to enhance credibility in this study were spending an extensive amount time in the field, being close to the participants (p. 250), and providing participants the opportunity to review interview transcripts for accuracy. Conducting personal interviews with participants responsible for decision making provided the

closeness, and spending time conducting the interviews and allowing participants to review the draft data collection for accuracy further enhanced credibility. In addition, the findings were also reviewed by the participants of the study to ensure the realities of the information they conveyed in the interviews was accurately reflected.

Transferability

Transferability is achieved when case study findings can be generalized to new cases. to make the results transferable, detailed documentation of the problem was maintained through the use of a case study database. A thick description of the case study results was necessary to ensure that the findings were transferable. Bitsch (2005) presents purposeful sampling in addition to thick description as a strategy to achieve transferability. Transferability was achieved in this study by providing a detailed description of the research methods used as well as the participants' views. Findings will be described in a detailed manner to allow readers to determine whether or not the methodology and findings are be relevant to their own research.

Dependability

Dependability can be enhanced by making sure that the steps and procedures for the case study are thoroughly documented. The documentation process for this study included checking transcripts for obvious errors and ensuring the coding was descriptive and consistent by constantly comparing data with the codes that were developed. A detailed explanation will be provided on how the codes were developed from the interviews make this study replicable by other researchers. Dependability was also

enhanced in this study by using quality audio recording to transcribe the data. When recording was agreeable to the participants, the entire interview inclusive of instructions was recorded.

Confirmability

Confirmability is the confidence level the researcher has that the results of the study are true (Trochim, 2006). The researcher should demonstrate authenticity by making sure the data collected is trustworthy and accurate (Yin, 2016). Confirmability was achieved by having the participants review the interview transcripts for accuracy. It was important to transcribe and convey the interviews in a manner that the participant perceived to be true and accurate. This study will also use rich thick description to convey the findings, which was also weaved into the planned thematic coding process. Thorough and detailed descriptions were used to collect the data from the interviews, transcribe the data, and convey the results to demonstrate that the findings are a result of research and not any biases.

In addition to trustworthiness, care was shown regarding the confidentiality of the participants. As described in more detail in the ethical procedures section, using an informed consent process that includes a written description of the study to communicate the purpose and intent of the study, an option to refuse the study, the confidentiality of the data, and an option for anonymity ensured the fair and ethical treatment of the participants.

Summary

This chapter outlined the methodology in which the research for this study was conducted. This qualitative case study explores how local public health districts in mid-Atlantic states make decisions after budgets cuts. Face-to-face interviews were conducted with decision-makers from volunteer local health district directors or their designees to help provide insight on the decision making process used by their agency. After the data from the interviews and document review were transcribed and coded, a thematic analysis was conducted to determine similarities, differences, and possible linkages between the program areas selected. Then an analysis was conducted to highlight themes and subthemes that emerged from analysis and refinement. The themes were arranged to articulate the overarching narrative and applicability to theories of rationality from the perspective of the participants.

A report of the results of this study will be provided in Chapter 4. The report will include the data-collection methods, management of the data, and the results of the analyses, including descriptive and demographic characteristics of the sample. The chapter will also contain a description of the answers to the research questions.

Chapter 4: Results

Introduction

The purpose of this qualitative study was to understand the decision making processes of public health officials at local jurisdictional levels of the mid-Atlantic Department of Health during austere funding environments with decreased federal public health funding. The case study design and methods that I used in this study involved a personal telephone interview with the study participant to gain an understanding of how decision making occurs. The individual who participated in the interview was the sole decision maker for the local health district, which was composed of seven employees who were not involved in the decision making process. The participant requested anonymity in this study.

Setting

The interview date, time, and method were chosen by the decision-maker participant, who is a local public health official with more than 20 years of experience in public health. After reading the consent letter, background, and sample questions, the participant informed me that I would only be able to interview one person. There was one other position that was in a decision making role, but the person was a new hire and would not be able to answer the questions in the research protocol as determined by the participant. The other agency positions initially identified in Chapter 3 were not functioning in a decision making capacity. Due to time constraints and a tight schedule, the participant elected for a 1-hour telephone interview. The participant answered all

questions without reservation. The transcribed interview was sent to the participant for review. The participant reviewed the transcription, made a few edits, and sent the document back with approval.

Research Questions

The primary research question guiding this study was: How do mid-Atlantic local health districts use limited-rational-choice theory to make decisions related to public health emergency preparedness during austere fiscal conditions? Using limited rational choice theory as a guide, secondary questions were as follows:

- Considering feasibility and acceptance by stakeholders, how do participants select objectives for decision making?
- How does the availability of resources affect the development of or choice of planning objectives?
- What elements of the decision making process are explained to stakeholders?
- How are unknown or missing elements of information acknowledged in the decision making process?
- Does the decision making process encourage unique courses of action or minimal changes to current plans?
- How are risks and benefits of each course of action analyzed?

Participant Demographics

Decision makers from seven local health districts were invited by e-mail to participate in this study. Four districts declined the invitation, saying that they did not have enough personnel or had not experienced budget cuts. Three districts did not respond to the request. The one local health district that agreed to participate was also experiencing a limited staff. Under normal circumstances, the decision making process would include the director and the business manager, but at the time of the interview, the business manager position was vacant. The decision-maker interviewed was responsible for all of the staff and functions in the local health district being studied and possessed more than 15 years of experience in public health decision making.

Data Collection

The initial plan described in Chapter 3 was to interview nine to 12 decision-makers, but the health district director said that there were only two people actually involved in the decision making process, and one of those positions was vacant. The data was collected by conducting a telephone interview with the sole decision-maker responsible for the local health district. The consent letter was e-mailed upon initial invitation and again prior to the start of the interview. Prior to the start of the interview, the participant noted disagreement to the consent-form bullet item that stated, "Provide documentation related to relevant decision making activities, including but not limited to items such as meeting minutes, agendas, and risk analysis tools." The participant then gave verbal

consent to begin the interview. The interview was audio-recorded and lasted approximately one hour. The participant answered all questions, which were open-ended, and added clarification where necessary. Follow-up questions were also asked for clarification. The transcription process began immediately and took about two days, yielding five pages of single-spaced typed notes. The process of transcription gave a sense of the themes that would emerge in relationship to the theory. The notes were then saved and password-protected on the researcher's personal laptop. The transcribed notes along with the interview questions were e-mailed to the participant to review for accuracy. The participant made a few changes before returning the notes. After reviewing the changes, the researcher renamed and saved the document in the same electronic location as the first document and then imported the revised document into NVivo 12. Secondary data was used before and during the collection process in an effort to learn as much as possible about the health district and how it might conduct decision making. This data was also uploaded into NVivo 12 for analysis and comparison.

Data Analysis

The analysis process used to analyze the data was a six-phase thematic analysis process: (a) become familiar with the data, (b) generate initial codes, (c) search for themes, (d) review themes, (e) define and name themes, and (f) produce the report (Braun & Clarke, 2006). Phase 1 started during research of secondary data such as open-source documents on the Internet that provided information on public health issues in local public health districts. Although a face-to-face interview was preferable, the participant requested a telephone interview for convenience. The telephone interview was audio-

recorded, which allowed for more focus on the content of the interview. Rather than use transcribing software to transcribe the audio, the researcher felt that personally transcribing the interview would allow for greater familiarity with the data, thereby giving a deeper understanding. The researcher was specifically looking for and noticing patterns while reviewing the secondary data and listening for meanings and patterns during the telephone interview. After listening and then transcribing the audio, checking for errors, sending to the participant, and having the participant review and return the transcription with a few clarifications, and then reviewing again, the researcher noticed several coding ideas and patterns beginning to emerge. The transcribed interview, secondary data, and related articles were uploaded into NVivo 12 to prepare for further analysis.

Phase 2 involved generating initial codes. The initial codes were descriptive codes derived from the interview answers, and some were developed based on limited-rational-choice-theory and research questions. The codes were then sorted according to the areas in which they addressed the primary research question. Figure 1 provides an example of how the data extracts were coded. The answers in the figure are only a partial answer and intended to offer an example of the process used in this study to apply coding to the interview answers.

Table 3

Data Extract Sample, With Codes Applied

Interview Question 1: Can you explain how office and programmatic budgets are allocated?

Data extract sample	**Coded for**
"According to a particular formula, our budgets are based on population. State general funds are matched by the local jurisdiction. The State provides a certain amount of general funds matched by the County, and surrounding cities, which provides funds based on their population."	1. Formal budget decision process. 2. Funding coordination. 3. Stakeholder involvement. 4. Collaboration.
Data extract sample	**Coded for**
Interview Question 2: Whether formal or informal, please describe your decision making process?	
"We have a COOP plan that looks at how we would proceed in various public health emergencies, and depending on the length of time that the emergency would be, that we would be in this COOP mode, would depend on what services or how we would function."	5. Continuity of operations planning. 6. Uncertainty in length of response. 7. Generalized processes. 8. No trail, undefined decision process. 9. Incident dependent decisions. 10. Incident dependent functions.

Some of the codes were repetitive, and it became clear that they would overlap multiple categories. The sorted codes were then analyzed and grouped into subthemes that had evolved from the interview, secondary data, or subthemes related to some of the topics found relevant in the literature. To assist with the analysis of the codes, NVivo 12 was used to query most frequently used key terms from the interview and secondary data.

Phase 3 involved searching for themes. The predominant factor used to determine the final themes were the frequency of certain terms and phrases used by the participant as well as key terms in the agencies' secondary data that were relevant to a specific topic. Parent nodes and child nodes were created in NVivo 12 based on the answers to the interview questions and data from the local health districts publicly published planning documents. With the help of NVivo 12's word cloud function, a visualization of themes started to emerge. A word-cloud was created for each parent node. Figures 1, 2, 3, and 4 are visual depictions of the text search based on some of the initial coding and emerging theme ideas created from the interview questions.

Figure 1. Visualization of a word cloud based on planning.

Figure 2. Visualization of a word cloud based on impact.

Figure 3. Visualization of a word cloud based on budget.

Figure 4. Visualization of a word cloud based on communication.

Phase 4 involved reviewing each theme to identify patterns from coded text and phrases for cohesiveness. This was necessary because the word cloud did not provide context; however, it was a good reference to go back and review all of the words used in relation to the parent nodes and their contextual meaning. Codes that did not flow well with the parent node or were out of context were discarded. Each theme was also reviewed in relation to the theory to determine how the thematic framework would be relevant to the research question.

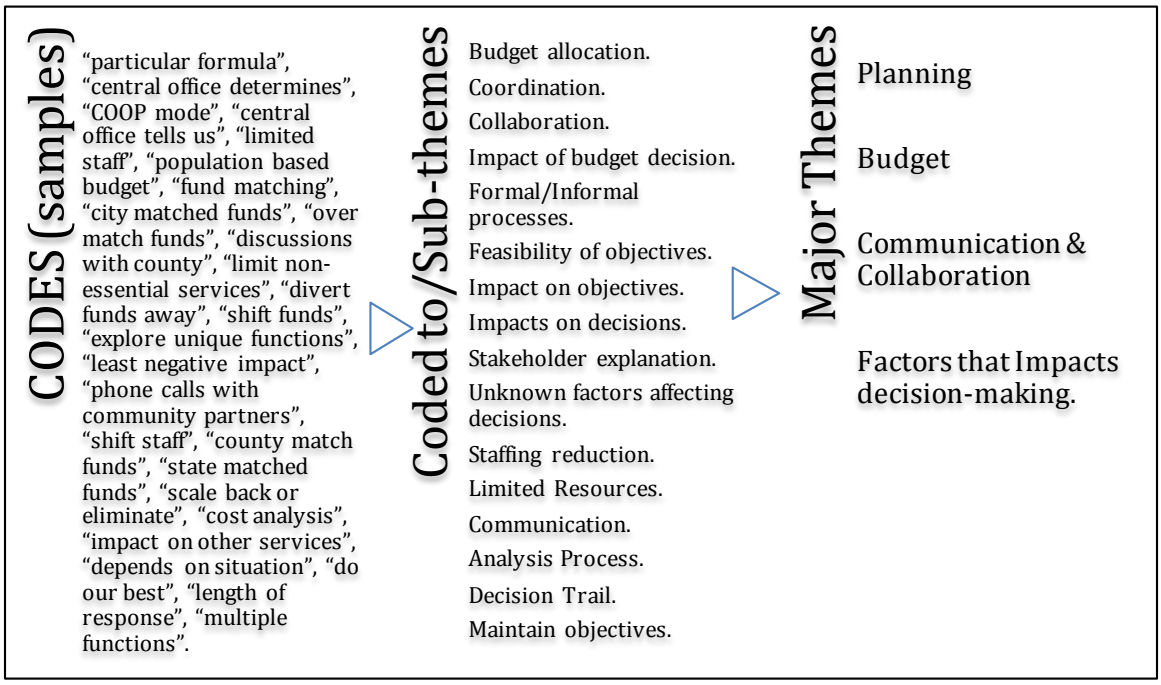

Figure 5. Thematic process example.

Phase 5 involved defining and naming themes. After further manual and NVivo 12 analyses of the codes and subthemes, the major themes selected were planning, budget, communication and collaboration, and factors that affect decision making. Phase 6 was the final narrative; it explains the meaning of each theme as presented in the results section. Initial and final thematic maps can be viewed in Appendixes D and E.

Evidence of Trustworthiness

Credibility

As previously stated in Chapter 3, credibility involves demonstrating that the results of the study are credible from the perspective of the participant and the reader. Strategies used to implement credibility were (a) participant-verified transcripts, (b) adherence to a specific research method, and (c) use of multiple data-collection methods. After the interview was transcribed, the transcription was e-mailed back to the participant to verify and validate the accuracy of the responses. The research methodology allowed for open-ended questions, which provided detailed descriptions and explanations to the research questions. Unfortunately, the participant's district was short-staffed and otherwise too small to collect more individual responses as originally intended.

Transferability

Although the findings of this qualitative study were not expected to be easily transferable, the processes were described in a rich, detailed manner so that other researchers who are interested in similar studies have enough information to determine whether or not the processes and findings will be beneficial to their study.

Dependability

To ensure dependability, the processes used for data collection and data analysis were presented step-by-step to include visual representations to be as transparent as possible. In addition, as articulated in Chapter 3, the interview was audio-recorded, manually transcribed, and e-mailed to the participant for verification and validation.

Confirmability

As discussed in Chapter 3, the researcher must ensure confirmability by demonstrating authenticity and making sure the data collected is trustworthy and accurate (Yin, 2016). The participant reviewed the interview transcript for accuracy and verified its contents to be true and accurate. This study used rich thick description for the coding process and to convey the findings. Detailed descriptions were used to describe the data-collection process for the interviews and data transcription and to convey the results to demonstrate that the findings were a result of research and not the researcher's biases.

The informed-consent process included a written description of the study to communicate its purpose and intent, an option to refuse the study, to describe the confidentiality of data, and to give an option for anonymity to ensure fair and ethical treatment of the participants.

Findings

After the informed-consent procedures were completed and the purpose of the study was articulated, the participant fully answered each of the interview questions in the context of a public health emergency. The goal was to learn how local public health agencies make decision during austere funding conditions and how these conditions affect the decision making process. The results were aggregated from the answers to the interview questions. The results were organized by the major themes: planning, factors affecting decision making, budget, and communication.

Major Theme 1: Planning

The first major theme to emerge from the data was planning. This theme was prevalent in every interview question. Nearly 30% of the total coded participant responses to the interview questions were directly related to planning, which was the highest percentage of the major themes.

The participant described the decision making process to include how objectives are selected, who is involved, how the availability of resources affects choice of objectives, communication with stakeholders, and how the analysis of risks and benefits occurs. The intent was to gain an understanding of how formal or informal the decision making process was to compare the elements of limited-rational-choice theory.

The participant indicated during the informed-consent process a discomfort with sharing agency documents that would divulge specific details about the decision making process; however, the participant did explain that the COOP plan provides guidance on how the local health district should proceed during public health emergencies. The participant indicated that a continuity-of-operations plan was developed and implemented by the emergency-management community and was instrumental in providing a reference on objectives and essential functions that are important during a public health emergency. For local public health communities, the continuity-of-operations plan defines what are considered "essential services" and how these services will be maintained during a public health emergency or disaster. The participant also explained that use of the continuity-of-operations plan "depends on the extent of the emergency response" and "looks at how we would proceed in various public health emergencies." The participant further explained

that "each division determines their own objectives and what essential services they will maintain so that they aren't trying to figure out what to do in the middle of a disaster." Objectives for the plan are determined based on what will have the least negative affect on the community. Each stakeholder develops objectives for the COOP independently and then provides that information for the development of the plan as a whole. Use of the COOP plan would depend on the complexity and length of the emergency. However, even with the COOP plan, things do not always go as planned because there may be unknown challenges presented by the disease pathogen that hinder the use of the process as outlined in the plan.

When asked what elements of the decision making process are explained to stakeholders, the participant explained that the stakeholders—meaning agencies and clients—are provided an explanation of the decision that was made and why. Whenever possible, the decision explanation includes data that supports decision making where it concerns stakeholders and partners from other agencies. The participated noted that "we conduct phone calls" and "we met with our partners" to explain "why we we're going this way."

When asked how unknown or missing elements of information were acknowledged in the decision making process**,** the participant explained that the epidemiology of an emerging disease is often unknown in the beginning. The participant noted that this is challenging and affects where human resources are placed and other things that need to be done to address the issue. Decisions made on an emerging infectious disease, where little is known about the pathogen, are usually handled by

having many collaborative phone calls with the central office, the Division of Disease Control Department, the Centers for Disease Control (CDC), and other community partners as necessary to gain as much information about the disease as possible. The central office would make the final decision on how to move forward and communicate its findings and final decision in writing.

The participant answered questions about how risks and benefits of each course of action were developed and compared. The participant explained that a cost-benefit analysis would be conducted to determine which services to maintain and which services to temporarily suspend, with consideration to the employees that are providing the service and what services can be attained by the clients elsewhere. Finally, the participant offered that the most significant challenge with service delivery after funding cuts is the possibility of cutting staff nurses. These nurses may provide more than just one service. Nurses may work maternity, communicable disease, and immunizations. So, if a maternity-nurse position were cut to accommodate an increased disaster response, this would affect other areas that would be needed during a public health emergency, such as vaccine clinics.

Major Theme 2: Decision making Impacts

The participant articulated several factors that would affect decision making during a public health emergency, among them budget cuts, limited staffing, program cuts, unknown epidemiological factors, and the discontinuation of nonessential services. Regarding the effects of budget cuts on decision making, the participant noted that decreased funding

> definitely affects where you put your human resources towards and what else you have to do to address this emerging public health issue. Decreasing the impact of budget cuts while meeting the necessary objectives may require shifting staff, shifting grant funds away from other programs consider nonessential, and coordinating with private sectors partners to see if they can offer assistance. Any service that is offered by another community organization may be temporarily suspended to allow us to focus our efforts and resources on the emergency response. Regardless of funding, we would still aim to meet our planning objectives outlined in the COOP plan; essential services will continue. Nonessential services will be put on hold. The district would determine what the impact would be and find unique ways to make up the lost funding.

Another crosscutting affect to decision making was unknown epidemiology. The participant said, "You don't know the epidemiology in the beginning." Not knowing the disease epidemiology would hinder the development of courses of action, leading to limitations in decision making.

Major Theme 3: Budget

The participant was asked to explain how office or programmatic budgets are allocated, who is involved in the budget process, how the process works, and how it affects the decisions that are made. The intent was to understand fund allocation, whether or not funding is dispersed generally or based on the importance of certain programs, and the resulting affects, if any. The participant explained:

> The budget is formulated based on a particular formula that considers the population of surrounding counties and cities that form the local public health district. The county also pays additional over-match funds for ordinances. In addition to the local cost share, funding is also received from the federal government in the form of grants for various programmatic purpose. In the case of public health emergencies, the federal government would provide additional funds that would be funneled down to the local health district. The budget decisions concerning how emergency funding would be allocated would be made by the central office. That the allocation of funds would depend on the circumstances and complexities of the public health emergency. There are continuity-of-operations (COOP) procedures that preidentify what services would be halted and which would continue. The state may eventually receive funds that would be passed down to the local health district to help fund the public health emergency.

Regarding an example of how the budget has affected decisions that were made, the participant indicated that public health practitioners generally "make due." The participant further explained that they "make due" by:

> . . . following processes outlined in the COOP plan to include continuing essential services, temporarily suspending nonessential services, working 18-hr shifts, not accepting new clients, and focusing on vaccine clinics if the emergency is related to emerging infectious disease or a biological incident.

Major Theme 4: Communication

The local health district conducts planning in a highly collaborative environment that includes exchanging information by communicating with federal, state, county, city, and other private entities regarding decisions that are made and considered to be in the best interest of the community. The participant explained, "Discussions may occur with county officials regarding local funding." In addition to funding, the participant indicated that "there are things that we're doing that perhaps the private sector could do," "we want them to understand why we've made such decisions," and "we wanted to make sure they got connected to the right services." These comments revealed that communication with the private sector is an important part of making sure stakeholders and clients that provide and need services are able to receive them in the event that nonessential services are discontinued at the local health district level.

Another mention of communication concerned physical meetings in reference to both discontinuation of services and unknown epidemiological factors that may affect essential services. The participant noted that "we met with our partners to let them know we're going this way and the reasons why" and "we want to explain to them" in reference to how decisions are made after a public health emergency. Although the participant articulated evidence of communication and collaboration with stakeholders and clients, there was no evidence that anyone outside of the local health district and the central office was involved in any of the decisions that were topics in any of the phone calls or meetings referenced.

Connection to Limited-Rational-Choice Theory

LRCT explains how organizations make decisions when resources are limited. As reflected in Table 2, LRCT is considered to be a factor if (a) decision-makers only develop objectives that are thought to be feasible and are likely to be agreed upon; (b) plans are formulated based on limited objectives and uncertain availability of resources to implement the plan; (c) the decision making trail can explain why the decision was made and not necessarily the "best" decision; (d) analysis includes what limited information was known at the time the decision was made, acknowledging that there are elements missing; and (e) courses of action are strikingly similar with only small variances between them, and the risks of each course of action are not calculated (Lindblom, 1957).

In the first category, the local health district participant noted that objectives were developed based on the anticipated needs of the community. When an incident occurs, the objectives are revisited based on the severity of the disease pathogen and ethical issues. The issue of feasibility or agreeability did not enter the conversation, nor were these issues identified in any of the secondary data. However, it is possible that feasibility could be a concern for other agencies that have contributed to the objectives outlined in the COOP plan that may have some effect on the local health district. Another consideration made by the local health district was whether or not the services related to the objectives were offered through another agency. Again, there was no indication that feasibility or agreement of objectives played any role in the selection of objectives, only the needs of the community.

The second category considers planning based on limited objectives that cannot be completely achieved due to limited resources. The participant indicated that the agencies' COOP plan contains preidentified objectives for an infectious disease event like an influenza pandemic or Zika. These preidentified objectives were aligned with the needs of the community regardless of the ability to fund them at the time the planning objectives were formulated. However, at the beginning of a biological incident, the participant acknowledged that information about the pathogen may be limited. The participant also noted that with or without sufficient funding, sufficient staffing was a challenge. Although funding does not appear to be a challenge during the development of objectives, sufficient staffing for the public health emergency is challenging. This results in the local health district having to reduce or suspend services in other areas of public health for the duration of the public health emergency. The limited resources in this case is staffing and funding. Through unique realignment of resources during an emergency, the local health district was still able to achieve public health emergency objectives outlined in their emergency plans.

The third category concerns the local health district's decision making trail that explains why the decisions being made were the best possible decision. Although the participant asserted that "we make decisions that are in the best interest of the community," there was no written evidence that the participant was willing to share of a decision making trail that detailed a comparison between courses of action that would lead to an explanation of the best decision being made.

The fourth category concerns the formal consideration of unknown information during the decision making process. The participant confirmed that information such as epidemiology issues and funding amounts are often unknown at the time planning decisions are made. The objectives that are outlined in the COOP plans are process focused. For example, the COOP plan may call for the operation of a vaccine campaign, but the plan also acknowledges that there may not be a vaccine developed for the disease pathogen for an extended period of time. The same plan also acknowledges the processes that need to occur but does not mention funding or the budget, even though the Department of Planning and Budget was listed as a contributor the plan.

The fifth and final category to assess whether or not limited rational choice is relevant to the decision making processes of this organization concerns the analysis of the courses of action. In the absence of information that would detail how objectives were developed, previous publicly published plans were used to determine if or how much objectives had changed. The degree to which the objectives were changed or modified provides some insight on the degree of analysis used to compare objectives.

Summary

Chapter 4 discussed the thematic analysis of an interview with a local health district official regarding how budget cuts affect decision making. The primary research question was, How do mid-Atlantic local health districts use limited-rational-choice theory to make decisions related to public health emergency preparedness during austere fiscal conditions? Interview questions that were designed to address each area of limited-rational-choice theory were answered by the participant. With the assistance of NVivo 12

software, the themes and subthemes were identified. Analysis of the interview data and departmental plans revealed that some elements of the decision making process are limited by staffing and limited information, which are a result of limited funding and not necessarily budget cuts. Decision making officials may know the process they will use to confront a public health emergency, but they do not always know to what extent they are prepared with funding resources or staffing resources to successfully meet planning objectives. The three major themes that evolved to explain how local health districts make decisions were planning, budget, communications, and factors that affect decision making. In Chapter 5, I will provide an interpretation of the findings, recommendations, and implications for positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this qualitative case study was to understand the decision making processes of public health officials at local jurisdictional levels of the mid-Atlantic Department of Health during austere funding environments with decreased federal public health funding. The primary aim of this study was to explore the decision making processes that affect the allocation of resources toward staffing, training, and planning initiatives devoted to public health initiatives for emergency preparedness. In addition, an objective of this study was to understand how public health officials at local health jurisdictions of the mid-Atlantic Department of Health make preparedness decisions, factors that may influence and limit their decision making, how those decisions affect programs, and the implications these decisions may have on the organization and the community.

Based on interview data from a local health district official, the findings suggest that the local health district's decision making process mostly aligned with limited-rational-choice theory. There was no clearly defined or transparent formal decision making process. In the absence of a clearly defined formal decision making process, conducting planning outside of the confines of the budget and limited funding provide the basis for how decision making occurs at the local public health level. Planning on how to shift personnel and resources to maintain essential services was found to be the primary focus of preparedness and response for a biological incident or infectious disease outbreak.

Key findings suggest that the decision making process is hindered by limited funding, limited information, and limited personnel after disasters. Limited funding affects the local health district's ability to maintain normal service levels during a public health disaster. Limited funding also means that funding may not be available to secure contract staffing support to augment a reduced workforce, which means the staff on duty will have to work extended hours and have extended exposure to possibly contagious patients, threatening their own personal safety. Because the virulence of the disease is not always known in advance, the public health officials would need to work closely with the CDC to gather as much information as possible to make quick and informed decisions in the best interests of the community. Limited information about disease epidemiology is a topic in which a certain level of uncertainty is expected and is usually factored into the decision making process.

In Chapter 5, I present the interpretation of the findings, limitations of the study, recommendations, implications for positive social change, and the conclusion.

Interpretation of the Findings

As stated in Chapter 2, rational-choice theory is a decision making theory that contends that decision makers will research all alternatives, develop courses of action that reflect a wide range of logical choices, and then choose the most rational choice with the expectation that the most logical rational decision will be agreed on before finalizing the choice or taking action (Secchi, 2011). Like the previous studies of local public health agencies conducted by Jarris et al. (2012), and Prust (2015), the local health district used for this study did not articulate a defined decision making process. Also, similar to the

previous studies, the local health district was found to place more focus on prioritization of resources to achieve objectives in a limited funding environment, without regard to the initial decision making process.

Other Limiting Factors

Political factors. As noted in the literature review, Jarris et al. (2012) found that public health leaders believe they operate in a political environment where the final decisions made are out of their control. Although the participant in this study did not cite political reasons, it was indicated that funding and program decisions were made at the central-office level and not the local level. Those decisions are then passed down for the local health district to implement. This gives the impression that local districts may not be part of the decision making process that will ultimately affect how they do business.

Consequences of funding limitations. Consequences to decision making after limited funding, such as the temporary termination of nonessential services, raising fees for other services, reassignment and longer working hours for medical staff, were another key finding, similar to those found in a study by Oliff, Mai, and Palacios (2012). However, the local health district in this study reduced some of the affect by collaborating with other community service providers who would be able to provide the same service and offer it to the clients until regular services could be resumed.

Creative Decision Making

Based on types of decision making described by Secchi (2011)—mechanical, choice implied, and creative—the local health district's decisions appear to be creative in

nature. Key descriptors of decision making that led to this determination were the local health district's decisions to shift or eliminate services and shift personnel within the means of the budget to meet public health emergency objectives. Even though the decision making process in terms of steps taken was not identified, it was determined that the decisions made aligned with the creative process defined in the literature review.

Theoretical Perspective

Consistent with the public health studies discussed in Chapter 2, the local public health district was not able to define elements of a decision making process that included all of the elements that are in alignment with rational-choice theory as described by Bouwmeester (2013). Overall, the decision making process most closely aligns with limited-rational-choice theory.

Revisiting Table 1, the first element of RCT and LRCT was the development of creative objectives (RCT) and the development of feasible objectives (LRCT). The local health district indicated that the objectives made for public health emergency planning were based on what is determined to be in the best interests of the community. In addition, the participant noted that the district would find ways to shift resources to meet objectives. However, feasibility is not a consideration for the local health district when it is developing objectives. This element of rationality aligns with RCT.

The second element states that the plan is formulated, and either the funding is acquired (RCT) or the resources to implement the plan are uncertain (LRCT). The local health district formulates the plan, but funding to implement depends on the scale of the

incident. Because it is not always known what the scale of the incident will be during the planning phase, this element of rationality aligns with LRCT.

The third element states that there is a decision making trail to prove that the most appropriate decision was chosen (RCT) or that the decision making trail can explain why but not necessarily why that decision is best (LRCT). It is clear from planning documents that the local health district develops objectives; however, the process used to develop the objectives was not defined, nor was it articulated in the interviews when the decision-maker was asked to explain the decision making process and how objectives were developed. Without a comparison of decisions and alternatives, it is difficult to explain why certain decisions were considered the best to make. For that reason, this element of rationality aligns with LRCT.

The fourth element concerned comprehensive analysis, where all alternatives were considered valid (RCT) and analysis developed from limited information, acknowledging the missing information (LRCT). The participant noted that it is not always known during the planning process what the extent of the public health emergency will be. Therefore, it would be challenging to consider or validate all alternatives. Even when planning for the worst of the worst, the district must consider limited funding as federal and state sources figure out if there will be funds dispersed for a public health emergency. The participant acknowledged that missing information, such as epidemiology, would be noted during the analysis phase. Therefore, this element of rationality aligns with LRCT.

The fifth and final element regarded the heavy use of theory (RCT) and limited or no use of theory (LRCT) to compare alternatives. The participant did not articulate a decision process, nor any type of formal analysis process that aligned with a theoretical view. Therefore, this element of rationality aligns with LRCT.

Limitations of the Study

The limiting factor of this study is that a single case was being studied, although one unit of analysis for a case study is considered reasonable. This was challenging because the participant chose not to release or discuss financial information or decision making specifics that would have helped to understand the affect of funding cuts on decision making. Also, the participating organization had only two decision making positions, of which one position was vacant. The study was also limited in scope as only one district in one state was researched and was constrained to decision making related to preparedness efforts aimed at minimizing the spread of an infectious disease outbreak. The findings of this study may not be relevant to agencies that are seeking knowledge related to decision making in public health but have not incurred budget cuts or limited funding that caused alternative decision making techniques.

Recommendations

The purpose of this qualitative case study was to understand how local public health districts made decisions for public health emergencies in an austere funding environment from a theoretical perspective. The goal was to gain insight on how the decision making process could be improved and ultimately how to best serve the communities that need that will need assistance in the aftermath of a public health emergency. Three considerations are presented for further study.

1. The first recommendation is that future researchers should continue to probe into the decision making processes of state and local public health agencies and their stakeholders to learn more about the collaborative decision making process. Doing so will eventually uncover the details and allow more relevant opportunities for improvement to be identified.
2. The second recommendation is for researchers to study how public health agencies prepare for staffing needs for a major infectious disease incident and the implications for limited staffing when funding for the incident may be limited. Doing so will help provide awareness on potential staffing shortages and how to counter the challenges in advance of a major incident.
3. The third recommendation is for researchers to study the public health emergency-declaration process to identify ways to streamline the process and help local public health agencies and states receive post disaster funding more quickly, to respond to public health emergencies more expeditiously. Doing so

will help scholars and practitioners identify challenges and recommend changes to the current process. Strengthening this process through scholarship will help with community resilience after a public health disaster.

4. The fourth recommendation is for public health professionals to study limited-rational-choice theory and its relationship to decision making processes used in their own organizations. Doing so would provide insight on the mechanics of the decision making and help the organization identify opportunities for improvement, which will lead to enhanced decision making practices that can be better justified to stakeholders.
5. The fifth recommendation is for public health professionals to establish a formal decision making process and track the outcomes of the decisions. This study found that formal decision making processes are underdeveloped. Developing decision making processes will help to provide consistency in decision, formal decision tracking, and a historical record of decisions to reference for future lessons learned.
6. The sixth recommendation is for transparency and inclusion in decision making, specifically for those in management positions who may be immediately affected by the decisions. This study found that local public health professionals in management positions may not be included or have visibility in the decision making processes that occur at the highest level of management. This would allow for two-way feedback on resource decisions

that ultimately may affect preparedness issues such as staffing, continuation of services, and funding allocations.

Implications

The implications for social change involved anticipating and addressing the needs of the public health system through decision making to protect the health care community and the reduction or elimination of the spread of disease in the wake of a biological incident. A successful response to a public health emergency means saving and protecting lives in a swift, decisive, and orderly manner. Doing so would mean earning the trust of the community in which we have an ethical responsibility to foster good health practices.

Conclusion

A well-defined and articulated decision making process can provide insight and awareness of inconsistencies in information and help to foster trust in the community. This is because, theoretically, a formal process would include analysis of all known information needed to make the best decision and the knowledge of the potential funding shortfalls before such information is desperately needed. Public health officials have a responsibility to protect their workforce and the community by planning and providing the most accurate and honest information possible to calm public fears that may exist after an infectious disease strikes.

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Appendix A: Interview Protocol

Case study interview questions

Interview Protocol for Participants:

Semi-structured/open-ended questions:

Background Questions:

What is your official job title?

How long have you been in this position?

How long have you been in a decision making role?

The questions I am going to ask are categorized in the three sections, (a) budget, and (b) decision making.

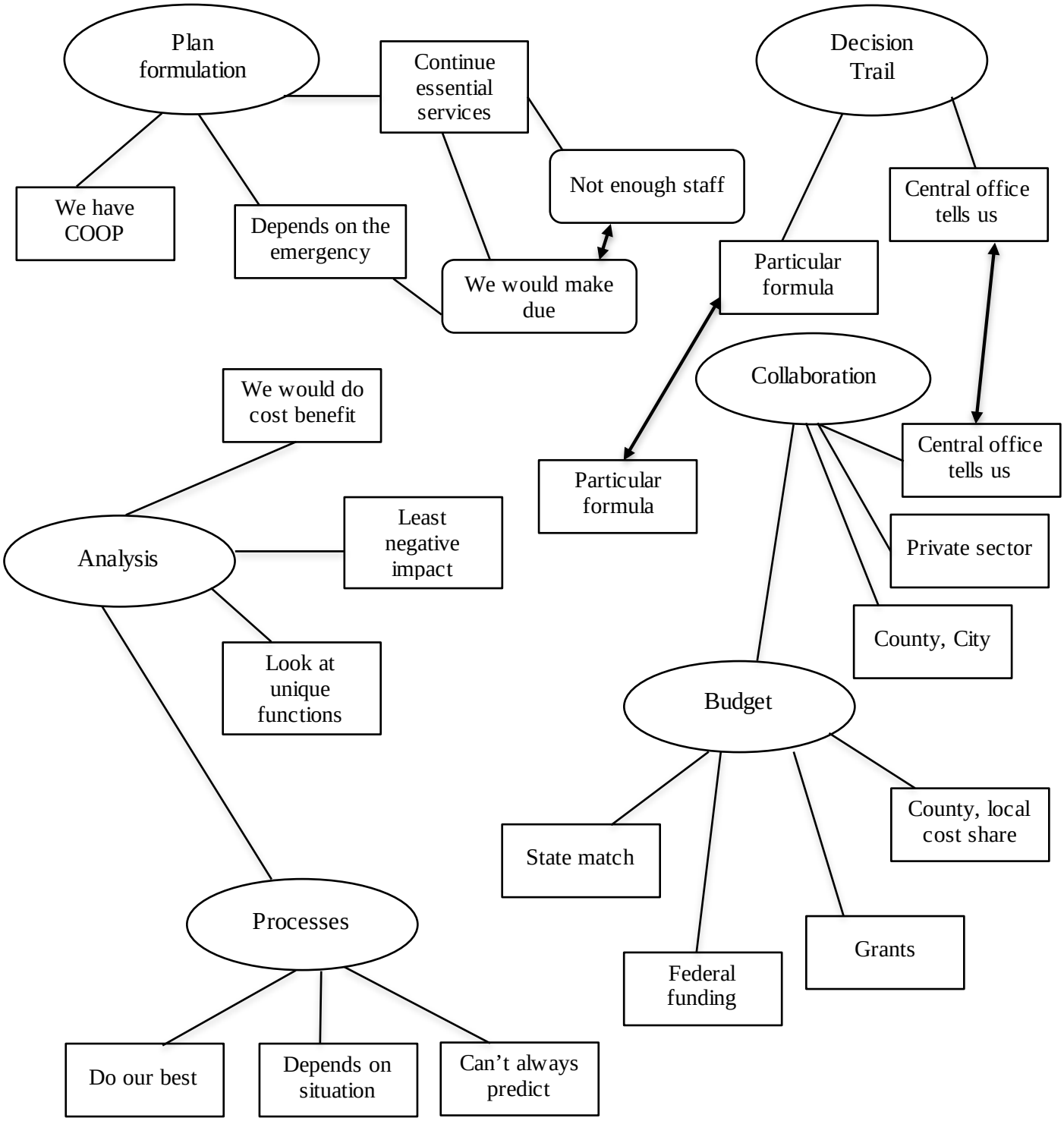
Budget Related Question:

1. Can you explain how office/programmatic budgets are allocated?
2. Who is involved in the budget process? Are there designated individuals who address budget? A committee? Can you explain how the process works?
3. Can you provide an example of how your budget has affected the decisions that were made?

Decision making Question:

4. Whether formal or informal, please describe your decision making process?
5. Considering feasibility and acceptance by stakeholders, how are objectives selected?
6. How does the availability of resources impact the development of, or choice of planning objectives?
7. What elements of the decision making process are explained to stakeholders?
8. How are unknown or missing elements of information acknowledged in the decision making process?
9. How are risks and benefits of each course of action developed and compared?

Appendix B: Initial Thematic Map



Appendix C: Final Thematic Map