CONTINUITY PLANNING FOR LOCAL PUBLIC HEALTH AGENCIES IN NORTHERN WISCONSIN: PROVIDING ESSENTIAL PUBLIC HEALTH SERVICES AFTER DISPLACEMENT

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We recommend acceptance of this thesis in partial fulfillment of the candidate's requirements for the degree of Master of Public Health in Community Health Education

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CONTINUITY PLANNING FOR LOCAL PUBLIC HEALTH AGENCIES IN NORTHERN WISCONSIN: PROVIDING ESSENTIAL PUBLIC HEALTH SERVICES AFTER DISPLACEMENT

A Chapter Style Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Public Health in Community Health Education

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ABSTRACT

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The *Continuity Planning in Public Health Survey* (CPPHS) was developed to assess the awareness of continuity planning (CP) within the Northwoods Public Health Preparedness Consortium of Northern Wisconsin. Study participants were comprised of 15 females and 2 males. Respondents worked within public health in a managerial or supervisory capacity, with a mean of 10.2 years work experience within their current positions. A total of 17 surveys were analyzed using the Kolmogorov-Smirnov one-sample test for survey item analyses, along with qualitative analyses. Response rate was 77.27%. The Ss assessed: 1) statistical significance in the awareness and implementation of CP, 2) statistical verification regarding the use of CP within preparedness plans, and 3) statistical assessment of public health capacity within the challenges and benefits of CP, following displacement, which is not being able to work from the normal place of business. The data enabled the researcher to qualify trends in responses to answer three research questions. Recommendations are offered for improving awareness and implementation of CP within public health.

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CHAPTER I

INTRODUCTION

Background

The events of September 11, 2001 surprised people of the United States - especially emergency response personnel. Local public health agencies in Wisconsin have been participating in emergency preparedness ever since the events of September 11, 2001 placed the United States on perpetual alert. Disasters such as Hurricane Katrina have tested emergency preparedness plans and the capacity of local officials to respond effectively within the first 72 hours of a disaster. Hurricane Katrina demonstrated that having preparedness plans in place does not necessarily guarantee that an adequate response can be provided. Local, state and federal authorities did not anticipate the magnitude of the disaster, which impeded their efforts in providing a timely emergency response, after Katrina struck.

According to Jim Carafano, a homeland security expert at the Heritage Foundation, "The problem is that DHS's [Division of Homeland Security] plans still assume that state and local authorities will be responsible in the first 72 hours after a catastrophe." He went on to say that, "In this case the state and local response was wiped out. There was no one to fill the 72-hour gap" (Kelly, et al., 2005, p. 41).

While a hurricane the magnitude of Katrina could not happen in the northern region of Wisconsin, other man-made and natural disasters can and do occur regularly. A

serious disaster could result in a local public health agency being displaced and not able to provide an appropriate public health response within the first 72 hours. Natural or man-made disasters such as a tornado, fire, flood, winter storm, accidental chemical release, or major power outage could hamper a public health agency's ability to respond.

Public health agencies in Wisconsin, under the guidance of the Division of Public Health, are members of public health consortia who provide technical expertise and leadership in the development of public health emergency response plans. Wisconsin public health consortia had been established since 2002. Public health consortia work extensively with local public health in preparedness planning. While public health officials may not be one of the first responders following a disaster it is essential that they have a plan to provide assistance in triage situations within the first 72 hours, and have the capacity to maintain essential public health services during the time of recovery from a disaster. Such a plan would include, but not be limited to: care of injured victims; assisting in construction of temporary shelters for the displaced and homeless; and maintaining communications needed for public health surveillance and services.

Continuity planning can improve the response to a disaster and facilitate a quick return to pre-disaster operations. Moreover, continuity planning is considered the foundation on which all emergency response plans are built (Cashen, 2006). Continuity planning allows public health agencies to preserve essential medical, personal, and public records. It would also allow the preparedness planner to examine, review and designate essential staff needed within the first 72 hours, identify office supplies and hardware needed to carry out daily operations if displaced, and identify and secure essential records containing confidential medical information, as mandated in the Health Care Portability

and Accountability Act (HIPAA) of 1996. The HIPAA requires security measures for the preservation of medical records, and to maintain them in a non-corruptible state.

Purpose of the Study

The purpose of this study was to document the use of continuity planning by local public health agencies in northern Wisconsin. A secondary purpose was to define continuity planning within public health by identifying factors that prohibit, limit and enhance the use of continuity planning. Further, this study examined the requirements of the HIPAA in public health and the use of continuity planning to meet the requirements for record keeping.

There are three major arenas in public health where continuity planning can be utilized, they are:

1) RESOURCES. Disaster recovery can be managed under continuity planning by identifying the resources needed to operate as a health department and provide essential services during an emergency (personnel, records, equipment);
2) RECORDS. The recovery and security of personal information of clients and medical records for which rules of the HIPAA apply; and
3) OUTBREAKS. The use of continuity planning in preparedness for pandemic influenza outbreaks in which public health agencies will play a key role in providing care by setting up temporary immunization clinics and administering care for infected individuals who have been placed under health department quarantine. Being able to engage staff, manage records, and provide an effective response to the emergency will be critical within the first 72 hours. Having the

capacity to provide essential public health services during the time of recovery will also be crucial.

Statement of the Problem

It has been stated, "No single agency – [Centers for Disease Control and Prevention] CDC, [World Health Organization] WHO, the military, or a non-governmental organization – currently has the resources, staff, or equipment to act as a rapid-response strike force during a civilian health emergency" (Glasser, 2004, p. 42). An assumption of this study is that continuity planning can be of great benefit to public health preparedness planning in addressing this deficiency and is currently under utilized in public health practice. It is further assumed that the basic principles of continuity planning are rarely considered in the daily operations of public health agencies resulting in a loss of community service when normal operations are interrupted.

This planning is especially important for flu pandemic preparedness because the public health agency will have a primary role in response and recovery. As Glasser stated,

> The truly imminent biological threat, which all public-health experts agree will inevitably strike, is influenza pandemic. The 1918 pandemic killed 550,000 Americans and 30 million worldwide. A virulent flu would thus be much worse than a bioterrorism attack, and it would strike every part of the country more or less simultaneously (2004, p. 41).

A major obstacle in utilizing continuity planning is incompatible information technologies (IT) among public health agencies in northern Wisconsin that use different equipment and software for record keeping, tracking clients and serving the public. A wide range of systems exist for accessing public health records and data. Some of these systems include the Registry for Effectively Communicating Immunization Needs

(RECIN), Secure Public Health Electronic Record Environment (SPHERE), and the Health Alert Network (HAN). Several public health agencies have also developed their own software and programs which had led to even greater disparities among health agencies in the northern region of Wisconsin. This incompatibility presents greater challenges in maintaining daily operations of public health services, but even more so if a public health agency is displaced as a result of a disaster.

Need for the Study

Governmental agencies' (federal, state, and local) inadequate response to Hurricane Katrina victims shows how critical it is to implement a plan within the first 72 hours of a disaster in order to save lives and property.

Glasser's assertion implies that implementation of a local response plan is critical immediately following a disaster to avoid further tragedy. Avoidance of further tragedy and a return to normal operations is the goal of several continuity planning models, which can be used as a template by public health agencies. The templates of continuity planning that will be examined in the course of this text include: business continuity planning (BCP), continuity of operations planning (COOP), continuity of government (COG), and contingency planning.

BCP was developed to maintain order, preserve irreplaceable records and provide a means of maintaining operations of an organization (Wallace & Webber, 2004). COOP is another example of a template whose purpose is to maintain operations of an organization (Cashen, 2006). It is believed by the researcher that public health agencies in northern Wisconsin have yet to adopt any models of continuity planning, a fact that may negatively impact their response to a disaster.

Further uses of continuity planning within public health include management of the security requirements of the HIPAA, and while HIPAA may not apply to all medical records used within the context of public health, it does provide a best practice as to record security and recovery (Thacker, et al., 2003). Pandemic flu is also a disaster scenario in which response can be enhanced with the use of continuity planning (Dernovsek, 2006). Pandemic flu can be viewed as a disaster that results in little damage to physical structures, but displacement can occur as a result of quarantine orders (Landesman, 2001). Pandemic flu preparedness planning may lend itself to the principles of continuity planning if properly prepared.

This study aims to determine the value of incorporating continuity planning into flu pandemic preparedness. It further examines the level of familiarity public health officials have with the construct of continuity planning within the infrastructure of public health.

Research Questions to be Answered

1. To what degree are public health agencies in northern Wisconsin prepared to respond to an emergency and maintain essential services if displacement from their agency should occur?
2. To what degree is continuity planning taken into consideration by public health agencies in northern Wisconsin, when drafting emergency response plans or plans of preparedness? Is there a tendency for plans that address flu pandemic response and the HIPAA to be more applicable to continuity planning?

3. To what degree are public health agencies in northern Wisconsin able to meet the inherent information technology (IT) challenges related to record storage and retrieval in order to maintain essential public health services during displacement?

Assumptions

1. For this study, it was assumed that most public health agencies in northern Wisconsin are familiar with the principles of continuity planning and have made some attempts to incorporate the templates of continuity planning into public health preparedness planning.
2. Without having formal training in the use of templates, continuity planning cannot be utilized to its fullest capacity within public health programming, especially when continuity planning practices are used to manage disaster response as well as day to day operations.
3. Public health preparedness plans that do not incorporate continuity planning principles will not reach full potential at providing needed services within the initial 72-hour response window and maintain essential services during the period of recovery. This assumption is especially true if the public health agency is displaced.

Delimitations

The results of this study are mostly qualitative in nature. Participants were public health officers for local county health departments and directors of public health agencies and health care facilities from the northern region of the Wisconsin public health system, as identified by the Wisconsin Bureau of Public Health.

The northern region is comprised of 15 local public health agencies that represent 15 counties, six tribal health agencies, and a regional office operated by the state of Wisconsin. The public health officers and directors of northern Wisconsin represent a small part of public health structure in Wisconsin.

Limitations

1. Every health officer (HO) and health director (HD) in the Northwoods Public Health Preparedness Consortium (NPHPC) was sent a survey to respond to items concerning the use of continuity planning in public health planning (N=23). A small population size was used for convenience. Therefore, by limiting the population size, generalizability was limited to public health agencies in the NPHPC of northern Wisconsin in which HO or HD were employed.
2. Participants' expertise in continuity planning varied, and was dependent on agency size, needs of the public and (IT) capacity.
3. Opportunities to clarify interview responses were limited due to survey design constraints, time and resource availability. The research tool limited the number and complexity of questions. Further clarification from respondents was open to interpretation by the researcher (Gilmore and Campbell, 2005, p. 48).
4. Quantitative data gathered was limited based upon the design of the data collection instrument and data was self-reported. This could affect the accuracy of the data.

Definition of Terms

For the purpose of this study the term "continuity" is used to express the concept of continuation as it applies to services provided by an agency and may exceed general

concepts of response and recovery. Current literature on continuity planning identifies the concepts of continuation in business continuity planning (BCP), continuity of operation planning (COOP), continuity of government (COG), disaster recovery, contingency planning, and strategic planning. The following terms were used in the study:

Alternate Work Sites (AWS) – designed to meet the work needs of an organization or entity if displacement should occur, includes cold sites, warm sites, hot sites, and multiple sites (Laye, 2002; Thompson, 2003).

Business Continuity Planning (BCP) – a set of instructions, documents, and procedures that enable a business to respond to a disaster, without any stoppage or hindrance in its key operations, may also be referred to as a disaster recovery plan (Businessdirectory.com, 2009; Foster & Dye, 2005).

Chain of Trust Partner Agreement – a contract entered into by two business partners where there is an agreement that both parties will electronically exchange data and protect the integrity and confidentiality of the data exchanged (Thompson, 2003).

Cold Sites - is a vacant space which is assumed to meet the work needs of a company or agency to continue operations but has none of the logistical facilities or equipment (Laye, 2002; Thompson, 2003).

Contingency Plan – an emergency plan, which is based on risk assessments, available human and material resources, community preparedness, and federal, state, and local response, which is developed in expectation of a disaster (Landesman, 2001).

Continuity of Government (COG) - has been defined as the preservation, maintenance, or reconstitution of the civil government's ability to carry out its constitutional

responsibilities (Cashen, 2006). Continuity of government is concerned with the full range of governmental services including the three branches of government (judicial, legislative, and executive) and all levels of government (federal, state, and local) (Cashen, 2006).

Continuity of Operations Planning (COOP) – a plan or preparation to ensure continuity of an operation, through planning, by identifying and maintaining key elements of an operation when faced with a disaster (Cashen, 2006).

Crisis Communication Plan – developed by the DHS to be used during and after a disaster, organizes how to communicate to employees, local authorities, government officials, and clients or customers, provide instruction for employees on how and when to report to work during an emergency, outline what emergency assistance may be needed for essential business activity, and provide management with all relevant information needed to provide continuity and quick response (Centers for Disease Control and Prevention, n. d.).

Department of Homeland Security (DHS) – U. S. Department of Homeland Security was established by President Bush after the September 11, 2001 attacks. It was mandated by U. S. Congress in November of 2002 and became an official department in January of 2003. While the Department was created to secure the U. S. against those who seek to disrupt the American way of life, the DHS charter also includes preparation for and response to all hazards and disasters (www.dhs.gov).

Disaster – is described as any event, typically occurring suddenly, that causes damage, ecological disruption, loss of human life, deterioration of health and health services and

which extends the capacity of the effected community on a scale sufficient to require outside assistance (Landesman, 2001).

Disaster Avoidance – is avoiding disaster through three levels, or categories of activities, in almost all organizations. The top level consists of policy or senior management, the middle level is management or middle management, and the third level is operations or where the customer is served (Laye, 2002).

Disaster Recovery – is the capacity to recover from a disaster, including business restoration, when significant loss occurs (Rubin & Barbee, 1985; Laye, 2002).

Drive-Away Kits - assists in reestablishing critical functions by providing an alternative facility that will have small office supplies, communication equipment, plans, policies and procedures (Cashen, 2006).

Emergency Operation Center (EOC) – is the site from where officials direct emergency operations and carry out response plans during a disaster (Landesman, 2001).

Emergency Operation Plan (EOP) – a response plan of action and recovery that takes an all-hazard approach that is based upon FEMA's state and local guidelines (Kelly et al., 2005; Cashen, 2006).

Federal Emergency Management Agency (FEMA) – an agency of the federal government that prepares contingency plans for use in natural disasters and emergencies (MSN Encarta, 2009).

Health Information Portability and Accountability Act (HIPAA) - became enacted by the U. S. Congress in1996 to provide the public with greater access to health care insurance, protection of personal health information, and promote efficient standardization in health care (Thompson, 2003).

Hot Sites – are completely up to date and functional backup work sites which are maintained for both data and voice communications. The space is usually contracted for services and provides the smallest amount of interruption if a disaster occurs (Laye, 2002; Thompson, 2003).

Information Technology (IT) – includes the development, installation, and implementation of computer systems and related applications (Foster & Dye, 2005).

Incident Command System (ICS) – originally developed to provide disaster response for wild fires in the 1970s, command and management methodology is applicable to all disaster response (Landesman, 2001).

Local Area Networks (LANS) – a network between shared computers which support a wide range of programs and data (Webber & Wallace, 2004).

Multiple Centers – based upon a process where data is sent or received at two or more locations, called "shadowing", which allows for an organization to recover data from either site during disaster recovery (Thompson, 2003).

Mutual Aid Agreements – the sharing of supplies, equipment, personnel, information, or other resources across political boundaries (Stier & Goldman, 2007).

Multiple Response Sites – sites that may not be original site of doing business where a response to disaster can be staged for implementation (Broz, 2009).

Natural Disaster – rapid and acute phenomena of nature with lasting effects on living beings and structures. Examples include earthquakes, tornadoes, and floods (Landesman et al., 2001).

Pandemic Planning – is a plan of prepared response to a global outbreak of a disease which may include continuity planning (Dernovsek, 2006).

Public Health Consortia – assesses strengths and weaknesses related to bioterrorism and other public health emergency response within Consortiums as assigned by the Division of Public Health (NPHPC By-Laws, 2009).

Public Health Continuity – a plan that facilitates the coordination of public health providers and appropriate public or private partnerships to ensure critical health care needs are addressed (IFPMA, 2007).

Public Health Emergency Plan (PHEP) – developed by members of the NPHPC to provide a public health response to disasters or emergencies (M. K. Texidor, personal communication, March 13, 2009).

Risk – potential of a disaster occurring which is measured by both frequency and severity (Wallace & Webber, 2004).

Vital Records – are records which are irreplaceable and may be personal in nature (Cashen, 2006).

Warm Sites – is a cross between a cold site and hot site. While not a vacant space, it may require some installation of logistical hardware or work stations (Thompson, 2003).

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The purpose of this study was to document the use of continuity planning, and its ability to increase capacity and strengthen the infrastructure of public health within local agencies in a specific region of Wisconsin. Specifically, the purpose was to examine member agencies of the NPHPC in the northeast region of Wisconsin. Even before September 11, 2001, disaster response had a profound effect on public health services (Logue, 1996; Klitzman & Freundenberg, 2003). Being prepared for a disaster not only implies having an immediate response but also being able to recover and having little or no interruption of service (Landesman, 2001; Wallace & Webber, 2004).

This section will examine relevant literature concerning:

1) Historical development and need for continuity planning in disaster recovery
2) Influence of continuity planning on public health infrastructure
3) Implementation challenges in providing continuity planning within public health, and
4) Summary.

Historical Development and Need for Continuity Planning in Disaster Recovery

Risk and Continuity

The goal of continuity is to maintain business and services during times of crisis. Continuity planning is seen in a variety of planning templates, such business continuity planning (BCP), continuity of operations planning (COOP), continuity of government (COG) and contingency planning. Within all these templates for continuity, the same concepts of providing uninterrupted services during a crisis, response, and recovery including when displacement occurs remains a constant.

According to Cashen, "The extent to which disasters and emergencies can interrupt, paralyze, disrupt, and/or destroy our capabilities to preserve civil government institutions and perform essential government functions effectively under emergency conditions can vary" (Cashen, 2006, p. 13). As designed through a COOP and COG, continuity planning can ensure that "local government is able to preserve, maintain, and/or reconstitute its capability to function effectively in the event of the threat or occurrence of any disaster or emergency that could potentially disrupt local government operations and services" (Cashen, 2006, p. 14). Risk determines the need for continuity (Wallace & Webber, 2004).

Wallace and Webber claim that risk controls how an organization responds to a disaster and affects continuity planning (2004). Risk is built upon five "layers" that can be prioritized to find a solution to a problem (Wallace & Webber, 2004). The first layer is comprised of external risks that directly and indirectly affect business (Wallace & Webber, 2004).

External risks can occur naturally through severe weather or can result from man-made intentions or accidents, and which may disrupt employees or the work force (Wallace & Webber, 2004). The second layer of risk includes places of employment and

facilities, which may include one or multiple buildings (Wallace & Webber, 2004). This second component also includes loss of basic services like electricity, telephone communications and endangerments to a facility, such as from a bomb-threat or a spill of hazardous material that may not destroy the building, but make it temporarily uninhabitable (Wallace & Webber, 2004).

Damage to information technology (IT) or data system organization comprises the third layer or component of risk, according to Wallace & Webber (2004). The risk can be more severe if an entire network is affected where damage to a data system leads to a loss of information, and while most data can be recreated, to do so is expensive and time consuming (Wallace & Webber, 2004).

Risks of the fourth layer are periodic crises that can occur on a weekly basis, and are relevant to an individual department (Wallace & Webber, 2004). Wallace and Webber suggest that each department identify risks that might prevent them from getting job assignments completed and identify critical functions that are needed to meet weekly assignments (2004).

As proposed by Wallace and Webber, the fifth and last level of risk, concerns the employees' work station (2004). An assessment of the equipment and tools, including paper forms, which are needed to perform the employee's assigned duties, must be completed (Wallace & Webber, 2004).

These five layers of risk can be addressed through continuity planning by a company or agency, or more specifically addressed with the use of business continuity planning (Wallace & Webber, 2004). In 2003, Meta Group research reported that only 20% of Global 2000 organizations had business continuity plans effective enough to

ensure they could survive a disaster without long-lasting, adverse effects (The Information Management Journal). According to the American Red Cross (ARC), 40% of small businesses do not reopen after suffering a major natural disaster because they had no plan for continuity or disaster recovery (2008). After development, a recovery plan will focus on three components: human resources, physical resources, and business continuity (ARC, 2008).

Business Continuity Planning (BCP)

Identifying disaster risks can provide focus for BCP and create plans, which are more cost-effective (Siegel, 2008). Disaster can be broken down into three simple categories, which makes it easier to assess risk and where loss can occur (Siegel, 2008). Three categories of disasters included in BCP, are: natural, technical, and human (Siegel, 2008). Further clarification is not needed for the term natural disaster, but technical disasters and human disasters are relatively new when discussing risk management.

According to Siegel, technical disasters affect technological infrastructure, and include computer systems, transportation systems, power systems and telecommunication systems (2008). Human or man-made disasters are disruptions or other events that were caused by human actions, such as sabotage, illness, theft, supply disruptions, or strikes (Siegel, 2008). BCP is more than a one-time written plan, it needs to be communicated, practiced, tested and updated on a regular basis (Stearns, 2008). Many different types of industry such as health care, banking, financial services, and utilities have incorporated BCP into their business plans (Stearns, 2008). BCP was developed in the 1960s and focused on disaster recovery (Foster & Dye, 2005). Corporate business developed continuity planning to ensure they could provide services during and after a disaster

(Laye, 2002). Laye (2002) believes disasters are created by failing to resolve emergencies, and can become catastrophes, if not resolved. Disaster avoidance is used to prevent disasters from becoming catastrophes, through the use of BCP (Laye, 2002). BCP is governed by ten principles or steps to reduce risk (Laye, 2002). According to Laye (2002), there are ten principles of BCP, which apply to corporate and government organizations, as detailed below:

1. Project initiation. Establishes a goal that contains a mission statement, recognition of serious risk to the organization and benefits to the organization;
2. Risk assessment. Examine threats through the factors of severity and frequency. The assessment then allows for scenarios to be created and analyzed that can be used to generate a response;
3. Business impact analysis. Examines the effect of disruption on the ability to function and what requirements need to be met to resume daily operations;
4. Business continuity strategies. There are three general strategies: continuous operation, rapid restoration, and recovery;
5. Emergency response. The ability to stabilize and reverse situations that are deteriorating, often through emergency management;
6. Plan development. Elements of a plan would include:
    A. List business functions by determining which functions are critical to the mission of the business;
    B. Match appropriate strategies and identify essential elements to operate the functions;
    C. Combine elements together under allotted time restraints;

D. Identify and list resources that meet the needs of the chosen elements;

E. Set up resources in advance that will be needed to meet the plan;

F. Practice using the identified resources and essential elements in conducting business functions;

G. Make adjustments;

H. Rehearse the plan again.

7. Awareness and training. Awareness is created through both formal and informal communications. Training programs are designed to build the capacity needed to respond to disasters;

8. Maintaining and exercising plans. A plan is always evolving and never static. To perform the plan flawlessly requires practice through tabletop exercises, functional exercises and full exercises;

9. Public relations and crisis coordination. Enhancement of public relations within an organization, as well as within a community and related communications issues, and finally;

10. Interaction with government agencies. Government agencies can help, stand by, or hinder a company's effort to avoid disaster. The goal must be to maintain communities' qualities of life through their economic well being.

By the 1970s, information technology (IT) became an expensive corporate resource. Focus on BCP shifted toward preserving technology (Foster & Dye, 2005). In the 1970s, emphasis was placed on preserving IT by backing up computer data that was still being done in batch mode (Foster & Dye, 2005). With the advent of personal computers in the 1980s, IT reflected real-time computing, and BCP focused on response

time (Foster & Dye, 2005). By the 1990's as computer networks became established, IT addressed the requirements for internet security; BCP became more dependent on the need of human resources to provide backup and recovery of resources – safe from disruption (Foster & Dye, 2005). Foster and Dye point out that by 2000, financial markets began to drive more regulations for continuity planning, and Y2K decreased the reliance on third-party vendors and suppliers (2005). September 11, 2001 also served as a wake-up call for the need for continuity planning (Foster & Dye, 2005).

BCP traditionally dealt with risks, such as responding to natural disasters and weaknesses with infrastructure. BCP was later expanded to deal with unknown risks such as terrorist and bioterrorism acts (Foster & Dye, 2005). Dealing with risks from unknown threats has placed a greater emphasis on broader BCP, business recovery and practicing of plans (Foster & Dye, 2005). The next section focuses on how continuity planning addresses risk through BCP.

BCP case study. Foster and Dye completed a case study on the implementation of BCP that involved 12 participants from North American companies. The case study represented a cross-section of industry that had similar geographic footprints—each employed 36,000 employees on average and had international portfolios (2005). Interviews were conducted with personnel in charge of BCP (Foster & Dye, 2005). Questions were related to company culture, program governance, staffing and resources, policies and procedures, and program skills and capabilities (Foster & Dye, 2005). Their findings revealed several benchmarks, the first of which showed the importance of organizational programming and the business culture or value of the company (Foster & Dye, 2005).

Foster and Dye discussed benchmarks for companies that had incorporated BCP. The first bench mark found that companies that had an informal business culture and a "can-do" attitude had continuity planning that was informal and usually governed by a small set of recovery plans (Foster & Dye, 2005, p. 109). Larger companies produced commodities of more value to the overall economy (e.g. energy companies) and incorporated continuity planning to minimize disruption of services; smaller companies had more formal continuity planning that focused on disruption of service and rapid recovery (Foster & Dye, 2005). The second benchmark, summarized by Foster and Dye, was the discovery that corporate organizational structure drove continuity planning in BCP (2005). Companies with multi-tiered infrastructures had more robust plans for continuity; Foster and Dye believe that no core business unit functions alone, and that cooperation between units leads to greater communication and participation among business partners, such as human resources, IT, suppliers, management and finance (2005).

The third benchmark discussed by Foster and Dye, dealt with program structure and organization of business. A trend was noted that companies with informal structure and organization had fewer staff assigned to continuity planning—sometimes as few as three, while companies with more formal structure and organization had larger BCP programs and more staff assigned to continuity planning (2005). In their study, informal businesses were found to be generally technology companies and more formal businesses were in finance and energy (Foster & Dye, 2005).

Final benchmark identified by the Foster and Dye study found companies and industries that were subject to higher regulatory standards had more formalized policies

and procedure dealing with continuity planning than those less regulated (2005). In summary, Foster & Dye believe that in today's markets, BCP continuity isn't so much about business recovery as it is about resilience (2005).

Continuity of Operations Planning (COOP)

In researching the necessary elements of a continuity of operations plan (COOP) for local government, Cashen (2006) identified the following components of continuity planning, which can be used by local government agencies such as public health, to ensure continuity of services in response to a disaster:

- Purpose or objective. A statement that only critical services will be maintained by a local government during a disaster (Cashen, 2006)
- Continuity of government. Focus on local government's ability to maintain essential services, as they apply to "constitutional responsibilities" (Cashen, 2006, p. 39)
- Applicability and scope. Describe the population to which COOP applies and under what circumstances (Cashen, 2006)
- Authorities and references. A list of state statutes and local ordinances that govern actions of government, emergency response, and continuity planning, including reference to all emergency response plans and authorizing documents (Cashen, 2006)
- COOP implementation plans. Prepared plans of implementation of a COOP that detail the entire period of disruption, from initial activation to final closure (Cashen, 2006)

- Classification of emergencies and COOP responses. This classification defines the level of prepared response by a local government, based on severity of the disaster and its impact on essential functions and critical services (Cashen, 2006)
- Delegation of authority to key personnel. Identifies key personal, supervision structure and outlines their authority to make decisions within the COOP, based on local ordinances and state laws (Cashen, 2006)
- Orders of succession for key personnel. Details orders of succession following the loss of key personal and department heads (Cashen, 2006)
- Incident command system (ICS). Describes the structure and control during an emergency and an integral part of COOP activation (Cashen, 2006)
- Identification of essential functions and critical services. An outline of essential functions, services, and programs carried out by an agency, along with identification of all key personnel, facilities and resources needed to provide services (Cashen, 2006)
- Alternative operating locations and facilities, which must include drive-away kits. This component addresses the loss of the primary facility and identifies an alternate facility that will enable an agency to reestablish critical functions within 12 hours of displacement (Cashen, 2006)
- Interoperable communications. Identifies critical communications systems, establishes backup systems, and provides contact lists for key personnel that are needed to support an agency's critical functions and provide internal and external communications (Cashen, 2006)

- Vital records, databases and systems. A system must be established that protects all vital records, databases, and documents that are part of an agency's critical functions, which includes back up of all electronic records to an off-site facility (Cashen, 2006)
- Financial management. As required by the U. S. Federal Emergency Management Agency (FEMA), the plan must secure all purchasing and expenditures and should consider costs for all hazard events, such as loss of power (Cashen, 2006)
- Security measures for personnel, records, alternate facilities and other government resources. Ensure the continuity of the operations by implementing security measures that safe guard the ingress and egress of agency personnel at all primary and alternative work sites (Cashen, 2006)
- Staff-dependent care plans to include personal preparedness, transportation, lodging and food. Provides for the protection of personnel as well as dependents and belongings, during a disaster (Cashen, 2006). Care plans include issues such as shelter, transportation to alternative work site(s), preparation kits and articles needed to sustain daily life (Cashen, 2006)
- Photographs, charts, rosters and maps. These documents provide resources for COOP, during activation and response (Cashen, 2006)
- Tests, training and exercise. Will familiarize agency personnel with COOP by having them practice their assigned roles through trainings, table-top exercises, and full-scale exercises (Cashen, 2006)
- Plan management/maintenance to include after action reports. Ensures the COOP reflects current agency organization structure, function, mission statement and

services (Cashen, 2006). After action reports are filed and incorporated into the COOP to address what didn't work and maintain best practices (Cashen, 2006).

Cashen reviewed 17 different COOPs from federal, state and local agencies, and identified elements of COOP (2006). In the 17 COOPs reviewed by Cashen, his results showed only an 88.2% of plans included continuity as an essential service (2006). The complete listing of Cashen's results may be found in Appendix A. Cashen believes it is imperative for local governments to complete and maintain a COOP (2006).

According to Cashen, as of 2003, every county within the state of Wisconsin should have a COOP or continuity of government plan (COG) (2006). These plans should ensure performance of essential functions during any event or emergency, which would disrupt normal operations (Cashen, 2006). In Wisconsin, the COOP/COG must be able to be activated within 12 hours of an event, and be able to sustain organization's operations for up to 30 days, and should also utilize local agencies' infrastructures (Cashen, 2006). The COOP developed for the state of Wisconsin covers purpose, authorities, objectives, and implementation (Cashen, 2006). The Wisconsin Division of Public Health developed public health consortia to assess "strengths and weaknesses related to bioterrorism and other public health emergency response, within defined consortium throughout the state (NPHPC By-Laws, 2009).

Continuity of Government (COG)

COG is a form of planning that focuses on the government's ability to maintain essential services during crises (Cashen, 2006). Created by U. S. President John F. Kennedy in the early 1960s, COG provides a network of disaster relief, emergency assistance, law enforcement, and information services for citizens (Lerner). COG covers

all three branches and levels of government (e.g.: federal, state, local and judicial, legislative, and executive) (Cashen, 2006). The Department of Homeland Security (DHS) gained authority to administer COG plans after September 11, 2001 (Lerner). DHS encourages state and local authorities to implement their own COGs to compliment the federal COG program (Lerner). COG is an element of COOP regarding initial response and administration of the plan, FEMA recommends the consolidation of COG/COOP (Cashen, 2006).

Continuity Planning and Public Health

Landesman and her co-authors in their article entitled, *Roles and Responsibilities of Public Health in Disaster Preparedness and Response,* affirm that "public health has broad responsibilities to prepare for and respond to disasters" (2001, p. 1). After a disaster has occurred, Landesman, et al., argue public health services must continue to be provided (Landesman et al., 2001). Their beliefs are based on facts that indicate the occurrence of natural disasters has increased within the last several decades, there is an ever-present risk from disasters that exists across the United States, disasters have a negative impact on the health of a community, the need for public health intervention will escalate during and immediately following the occurrence of a disaster, and public health has the expertise to provide assistance for communities to deal with the most common health related problems, (2001).

Preparing to respond to disasters and other emergencies is the primary mission of the Northwoods Public Health Preparedness Consortium (NPHPC), according to M. K. Texidor (personal communication, March 13, 2009). Its members are described in key documents that were developed by the group since it first met in early 2002. However,

the key documents do not include any formal, continuity plans (BCP, COOP, or COG, see Appendix C). The assumption by this researcher is that nuances of continuity planning are present in plans like the Public Health Emergency Plan (PHEP) and pandemic plan developed by the NPHPC. Members have worked on completing plans for emergency preparedness since 2002, when monies allocated from the Center of Disease Control and Prevention (CDC) were provided to states to become better prepared in dealing with emergencies. In a brochure published by Center for Health Policy at Columbia University School of Nursing, which was distributed by CDC, core competencies in emergency preparedness for public-health workers were identified to provide a competent workforce to implement emergency public-health plans (Center for Health Policy, Columbia University School of Nursing, 2003). The following is a list of standard competencies expected to be met by all public health workers in preparation for an emergency:

- Describe the role of public health in emergency response in a range of situations. For example, an agency will provide surveillance, investigation and public information during disease outbreaks and collaborate with other agencies in biological, environmental and weather emergencies
- Describe the agency chain of command in emergency response
- Identify and locate the agency emergency response plan. In large agencies, the pertinent portion of the plan is made available to participants
- Describe his/her functional role(s) and responsibilities in emergency response, and practice his/her role(s) during regular drills

- Demonstrate correct use of all communication equipment used in emergency communication
- Describe his/her communication role(s) in emergency response within the agency, the media, general public and personal relationships (with e.g. family, friends, neighbors)
- Identify limits of his/her own knowledge, skills and authority, and identify key system resources for referring matters that exceed their limits
- Apply creative problem solving and analysis to unusual challenges within his/her responsibilities and evaluate effectiveness of all actions
- Recognize deviations that may indicate an emergency and describe appropriate action (e.g. communicate clearly with the chain of command) (Center for Health Policy, Columbia University School of Nursing, 2003).

The researcher acknowledges that while continuity planning is not specifically listed as a component in existing emergency plans for the Consortium, continuity planning is recognized as an unspecified deviation from the normal operating procedure. However, the failure to specifically incorporate continuity planning into existing plans likely means significant and avoidable challenges will be encountered during future emergencies, if a public health agency is displaced after a disaster.

Being able to respond after a disaster is the first step in providing continuity, which is detailed in the CDC document, "*Public health emergency response guide for state, local and tribal public health directors"* (Department of Health and Human Services). The document was designed to provide guidance on how to respond during the first 24 hours of an emergency or disaster. The guide was written for state, local, and

tribal public health professionals, and is not intended as a substitute for an emergency response plan (Department of Health and Human Services). The expectation is that local agencies including public health officials will provide initial response during the first 24 to 72 hours after a disaster has occurred, which includes public health officials (Landesman, 2001; Cashen, 2006). Regardless of the type of emergency (man-made or natural disaster), public health response must provide for continuity of public health programs and services, as part of extended response that goes beyond the first 24 hours (Department of Health and Human Services).

Through his research, Cashen identified false assumptions within planning for continuity by local government. The first false assumption was a lack of planning due to infrequent of disaster occurrence and the second false assumption, that assistance after a disaster would be provided by existing state or federal officials within the prescribed time (2006). Generally, local governments with COOP were found in areas that had a high occurrence of natural disasters such as flooding and hurricanes (Cashen, 2006). While such disasters do not often affect members of the NPHPC, some members have taken additional steps in developing response plans that go beyond consortium requirements (M. K. Texidor, personal communication, March 13, 2009).

Applications of Continuity Planning in Public Health

Authors of a *Time* magazine article analyzed what went wrong with the disaster response for victims of Hurricane Katrina (2005). In the years that preceded the catastrophe, the authors reported $750 million was paid to small fire departments around the country primarily to increase staffing. They asked whether such expenditures would

have been better spent on emergency planning, rather than adding fire-fighting personnel, and implied that had money been spent on emergency planning and response, the magnitude of death, illness and suffering would have likely been much less. The situation worsened when the fire department was destroyed by fire and the authors note that the disaster evolved into a catastrophe, as staff were unable to respond (Kelly, et al., 2005). The researcher agrees with the Time authors' implication and believes continuity planning and effective implementation of the plan is the solution to preventing disasters from evolving into catastrophes.

Landesman stated, "Local public health authorities have primary responsibility for the health of a community following a disaster" (2001, p. 22). Landesman (2001) believes that, "the health sector is responsible for ensuring the continuity of health care services" (p. 24). Having continuity ensures services will not be interrupted following a disaster. "Public health works with health sector agencies in the community to coordinate planning for the continued delivery of services both during and after the disaster" (Landesman, 2001). To accomplish this Landesman, provides an action plan to coordinate preparations and responses for public health officials, both before and after a disaster has occurred (2001). Landesman's components of a public health action plan are as follows:

- Provide for continuity of health care services
- Monitor basic infrastructure of environmental health
- Assess the needs of the affected population
- Initiate community surveillance and injury prevention programs

- Maintain essential public health services, and make certain public health sector facilities are able to function after a disaster
- Allocate resources in order to provide services as prescribed by an action plan (2001).

Prior to September 11, 2001, researchers were concerned with the need to improve the response of public health officials to disasters. They suggested increasing ability to improve response (Logue, 1996). Landesman (2001) addressed the responsibilities of public health officials to create an action plan to respond to a disaster. Landesman's model for a public-health action plan has six, primary phases that reflect the core areas of public health. The model for disaster response includes activities related to planning, prevention, assessment, response, surveillance, and recovery (Landesman, 2001). The complete outline of Landesman's public health model is available in Appendix D. Maintaining health services, or in some instances reestablishing health services, is an activity included under the prevention phase (in this case, the services are listed under tertiary prevention; Landesman, 2001). Many of the activities suggested by Landesman, under the six response phases reflect the need to increase the number of public health staff, train existing staff, enhance record keeping and retrieval, and improve communications (Landesman, 2001).

Enhancement of Public Health Infrastructure with Continuity Planning Capacity Building

Public health agencies were weakened during the last decades of the twentieth century, as indicated by the reduction of expenditures dedicated to public health. In 1992,

expenditures were less than 1% of U.S. health-care spending (Glasser, 2004). With an increasing occurrence of natural and man-made disasters, the CDC recommended five enhancements to increase the capacity of public health to respond to and provide disaster relief services in the future (Rotz et al., 2001). The need for these enhancements arouse from perceived vulnerability to bioterrorism acts, such as the release of Sarin gas and dispersal of anthrax (Rotz et al., 2001). These enhancements include:

1. Preparedness and readiness assessment.
2. Detection and surveillance.
3. Identification and characterization of biological and chemical agents.
4. Response.
5. Information and communications (Rotz et al., 2001, p. 101).

The Center for Health Policy at Columbia University School of Nursing (2002) identified nine abilities needed by public health workers to:

1. Describe the role of public health during all emergencies or disasters in a community;
2. Describe the chain of command in emergency response;
3. Describe their roles in emergency response, and perform these roles in practice;
4. Use all communication equipment during emergencies;
5. Describe communication role(s) during an emergency response;
6. Identify own limitations of knowledge, and ability to establish other resources and contacts;
7. Differentiate and identify normal activity and non-normal activity that may indicate an emergency and take appropriate action;

8. Apply creative problem solving and analysis to unusual situations during emergency situations, work within roles and evaluate all actions.

The ability to respond must be built on a sound infrastructure of capacity (Rotz et al., 2001). In order to build capacity of an organization, four, major factors are required:

- Leadership capacity. Leaders must be able to inspire, prioritize, make decisions, provide direction, and be innovative
- Adaptive capacity. Ability to monitor, assess, and respond to changes
- Management capacity. Ability to provide efficient use of resources
- Operational capacity. Ability to implement key functions of organization and programs (Weiss, 2005).

Klitzman and Freudenberg addressed lessons learned in strengthening public health infrastructure after the attack on the World Trade Center (WTC) in lower Manhattan, New York, on September 11, 2001. According to Klitzman and Freudenberg, within 32 minutes after the first plane crashed into the WTC, the New York City Department of Health (DOH) activated its incidence command center (2003). Unfortunately, 22% of DOH's workforce was located in lower Manhattan, which was closed by the police, making it difficult to mobilize the public-health work force after the disaster. The situation was further complicated when many telephone and computer communication systems ceased to function (Klitzman & Freudenberg, 2003).

Not being able to conduct business from a designated worksite resulted in a need to have an alternative site to organize and work to provide a response (Laye, 2002). Such a displacement can occur as a result of a disaster. Having multiple response sites are key in responding to a variety of emergencies, and was suggested for emergency response

preparedness for local public health municipalities (Broz, Levin, Mucha, Pelzel, Wong, Persky, & Hershow, 2009). Klitzman and Freudenberg (2003) found, "The response to September 11th demonstrated the importance between responding to a crisis and maintaining other vital public health functions".

Flu Pandemic Planning

Planning for a pandemic flu outbreak is critical for an adequate response to minimize its negative impact in a community, and is considered one of the best applications of continuity planning in public health (CDC, 2005). In order for a public-health work force to continue to provide essential public health services during a pandemic event, CDC recommended public health agencies develop and practice a COOP within their communities (CDC, 2005). The COOP, which would also indentify other public health stake holders, would ensure a resilient public health work-force to safe guard against possible absenteeism, which is expected during an outbreak. Absenteeism would be due to the need to isolate and quarantine workers who were exposed to the influenza virus (CDC, 2005).

As of 2005, U.S. pandemic planning was lagging in several critical areas. In particular planning was insufficient at the state and local levels (Trust for America's Health, 2005). In 2007, the U. S., Government Accountability Office stated in a report, "That many organizations face a challenge in 'maintaining a focus on pandemic planning due to uncertainty of when a pandemic may occur' and then need to address more immediate issues(Thibodeau, 2007, p. 18)."

A flu pandemic will be highly disruptive to a workforce and business (IFPMA, 2007):

- If avian influenza adapts fully to humans, the disease will spread worldwide in a few weeks
- The pandemic will circle the globe in two to three waves that could recur after four to six months
- Twenty-five percent of the population may become ill in the first wave and decrease in subsequent waves
- Create a peak absentee rate between 30 to 50% (about 20% are expected to be simultaneously ill while the remainder are absent due to care-giving responsibilities and other personal reasons)
- A fatality rate of 3 to-5% of those who are ill, resulting in about1% mortality across the population (IFPMA, 2007, p. 16).

It is believed that smaller entities and agencies will not have enough staff to adequately respond to the pandemic.

Information Technology Systems for Public Health

According to Sequist, et al. (2005), "[a]n electronic health record is a powerful tool that can be implemented to address a more complete range of quality improvements". This conclusion was drawn after studying the use of electronic record keeping within the Indian Health Service (IHS). The IHS is an integrated health care information system used to provide data for Native Americans (Sequist, et al., 2005). As a public health practitioner, the researcher is familiar with various electronic systems that are currently used by local public health officials in performance of daily duties and how those records and systems are preserved.

Some of the systems include the Health Alert Network (HAN), Registry for Effectively Communicating Immunization Needs (RECIN), and Secure Public Health Record Environment (SPHERE)—all of which are Web-based programs that can be accessed from any computer, at any location, with proper authorization. There are also specialized programs used to maintain records, which are also Web-based, such as Healthspace. This computer program is used by regional and local public health agencies, and is a Web-based, privately-owned software system for use in licensing some public facilities, under the authority of the Wisconsin Department of Health, Section of Food Safety and Recreational Licensing.

CDC provides access to a Web-based program for the purpose of disease surveillance and reporting (National Disease Surveillance System (NEDSS) is used by both state and local public health agencies). Other electronic systems have been developed for the transmission of public-health surveillance data, such as the CDC's *Epi-Net*, which adapted similar standards and resulted in more public health data being shared among agencies (Thacker et al., 2003). Thacker and his associates, affirmed for public health to be effective, staff must use data and technology to assist in recovery from a disaster (2003).

In addition to Web-based networks, public health agencies also rely on local network systems for management of public health programs, including record keeping. The chief concerns about these systems are back-up and security. Public health information can be as simple as maintaining paper records. In these cases, experts recommend that all paper records, including forms be backed-up with optical imaging versions of the documents or drive-away kits (Cashen, 2006). In the 2005 publication

entitled "*The Trust for America's Health"* the authors reported on ways to improve basic response capacity in which they stated, "[t]he basic technology and tools of public health must be modernized to adequately protect the American people" (p. 7).

Challenges to be met by Public Health in using Continuity Planning

Record Keeping/HIPAA Requirements

In 1996, the Health Information Portability and Accountability Act (HIPAA) was approved by the U. S. Congress to provide the public with greater access to health care insurance, protect personal health information and promote efficient standardization in health care (Thompson, 2003). HIPAA also mandated the development and completion of standards related to the exchange of financial and administrative data (Thacker et al., 2003). These streams of healthcare-related data were produced with state-of-the-art technology, which changed how health records are recorded and maintained (Thacker et al., 2003). Mandated standards for electronic transmission for these types of healthcare-related records were developed in 1999, and the standards became accepted practice, which provided the opportunity to share data among various agencies for the first time (Thacker et al., 2003). As a standard for privacy, the HIPAA established national standards to protect a person's confidential information concerning medical records and health treatments (Florida Department of Health, Thacker et al., 2003). One of these standards mandated the creation of a "unique health identifier" for individuals within a community (Thacker et al., 2003), p. 246). The unique health identifier allows for electronic linkages of health care records as to location of an individual, and this information can then be used by public health in the surveillance and control of disease (Thacker et al., 2003). Public health reporting, as an entity, is exempt from the HIPAA

as it may hamper the surveillance, investigation, or intervention functions of public health (Florida Department of Health). Health information which is not individually identifiable is also exempt from requirements of the HIPAA (Thompson, 2003).

A portion of the HIPAA references a security rule which requires the establishment of disaster recovery and contingency or continuity plans (Florida Department of Health). In February of 2003 the Department of Health and Human Services (DHHS) adopted the HIPAA Security Final Rule establishing security standards to monitor all electronic health information (Thompson, 2003). All entities had to comply with the security standards of the HIPAA, no later than April 25, 2005 (Thompson, 2003). To gain compliance, implementation of "certain administrative, physical, and technical safe guards" had to occur (Thompson, 2003, p. 2). The implementation of these safeguards ensures that data is protected against unauthorized access, modification, distribution, and destruction (Thompson, 2003). Providing this coverage and maintaining continuity requires a strong data infrastructure (Thompson, 2003). Disaster recovery through a BCP will require planning to identify where people will perform their jobs, have access to telephones, speak to clients, send and receive faxes or e-mails, and note any special requirements related to equipment, websites, tools or machines (Thompson, 2003). All other administrative tasks including client data, records, and billing are now mandated by the HIPAA (Thompson, 2003). Loss must be thought of in terms of severity of damage including loss of data, loss of systems, loss of work space, loss of facility and means to provide disaster recovery (Thompson, 2003).

Continuity planning for data processing must include consideration of alternate work sites to maintain security of data (Thompson, 2003). Alternate work sites include

hot sites, warm sites, cold sites and multiple centers (Thompson, 2003). Thompson (2003) recommends the following components be part of a plan that provides for data recovery and continuity:

- Conduct a business impact analysis
- Develop a data backup plan
- Have a plan of continuity
- Have capability to recover applications and data in a short amount of time
- Have a program of plan evaluation and revision
- Have an evaluation or accreditation from an internal or third party
- Have a chain of trust partner agreement on hand.

Such plans can be cost prohibitive to smaller entities, including public health agencies (Thompson, 2003).

Information Technology Challenges

IT and data systems are critical to recovering continuity in supporting an agency's essential functions (Cashen, 2006). Identifying risks within an agency's IT and data systems is important because they can affect multiple departments adversely (Wallace & Webber, 2004). IT and data systems may include both personal and portable computers (laptops, notebooks, tablets, hand-held PCs), local area networks (LANS), central computer systems, file servers Internet access, systems and platforms (Wallace & Webber, 2004). Having support and backup of both primary systems and backup operating systems is key in providing continuity (Wallace & Webber, 2004). Key components include hardware (printers, scanners, and check printers), software, materials (unique materials such as forms, labels, and file feeds), users of the system, and suppliers

(Wallace & Webber, 2004). It is important to distinguish between Web-based programs which are nearly free standing and available through an Internet connection and programs which are supported by a server and or network that are not as portable (Wallace & Webber, 2004). Web-based programs have advantages because they are accessible from anywhere a computer can gain access to the World-Wide-Web, in essence making them accessible by portable hardware.

More complicated systems require greater planning via a BCP or COOP which provides protection of vital data and systems (Cashen, 2006). Results of a 2007 survey by *The Economist Intelligence Unit,* shows <50% of respondents indicated they could endure less than a day in downtime if their IT systems were not functional. A longer disruption may be serious enough to jeopardize the survival of their companies (Rozek & Groth, 2008). Such reliance on technology is a vital finding.

Communication

Communication is the key to successful response during a disaster (Landesman, 2001). Literature shows that communication systems need to support both internal and external communications, including voicemail, faxes, e-mail, and Internet, of an agency or entity (Cashen, 2006; Thompson, 2003; Landesman et al., 2001). In a random survey of American households about U. S. readiness and preparedness, 87% of the population surveyed (N=2,545) said that they would prefer to talk to someone directly when receiving crisis information and response advice for the situation at hand (Lasker, 2004). According to Lasker, "People are looking for decision-making support, *not* just facts" (2004, p. 19). During crisis, people need to talk to someone to 1) confirm what has been heard from government officials and the media, 2) gain additional information to answer

questions they may have, and 3) help them resolve conflict about what is best for their families (Lasker, 2004).

A plan of continuity for communication would include a detailed list of key contacts and personnel, back-up equipment or drive-away kits, and protective measures for critical equipment and transmissions (Cashen, 2006). Communication devices include: mobile phone, landline, fax machine, personal digital assistant, short message service, Blackberry or pager (Totty, 2008). In situations following a disaster, a simple but effective means of communication can be the establishment of a calling tree (Laye, 2002). The U. S. DHS suggests that a crisis communication plan be established (p. 7). The crisis communication plan would organize how to communicate with employees, local authorities, government officials, and clients or customers during and after a disaster. It would provide instruction for employees on how and when to report to work during an emergency, outline what emergency assistance may be needed for essential business activity, and provide management with all relevant information needed to provide continuity and quick response (DHS). Risk communications planning should also be considered by public health agencies when providing disaster response, as it is critical to convey complex information in a clear and simple manner (Landesman et al., 2001).

The literature suggests more work needs to be done to improve public health communications where health disparities exist, where communication-access disparities occur, and where there is limited application of electronic health interventions within underserved populations (Bernhardt, 2004). These conditions may exist in both rural and smaller communities (Landesman, 2001).

Contingency Plans and Crises

A study by Hutchins et al. reviewed contingency plans or plans of response that were used by business entities along the Gulf coast of the U. S. that were affected by Hurricane Katrina. The study compared plans that were established both pre- and post-Katrina (Hutchins et al., 2007). Results showed that of the entities surveyed (n=129) prior to Hurricane Katrina 46% identified having emergency communications plans, 34% participated in plans and drills and 33% had BCPs (Hutchins et al., 2007). Post-Katrina surveys revealed an increase in the number of BCPs established with the biggest change a 19% increase (p=.03) occurring in how to respond after an emergency (Hutchins et al., 2007). The study also revealed that larger business entities had more established and complete plans while smaller entities had fewer plans or plans with fewer components (Hutchins et al., 2007).

The size of the crises can be under estimated by the planned response (Kelly, 2005), as was the case with Hurricane Katrina. Mutual aid agreements were designed to fill in the gaps that resulted from failed response to hurricanes like Katrina and Andrew (Stier & Goodman, 2007). Mutual aid agreements can be between states and on a larger scale between countries (Stier and Goodman, 2007). Locally, members of the NPHPC use a form of a "handshake" agreement between local public health agencies and the regional office of the consortium, these agreements are referred to as MOUs or memorandums of understanding (M. K. Texidor, personal communication, March 13, 2009). Like mutual aid agreements, MOUs are a nonbinding arrangement for resources and services that are associated with issues of liability compensation as well as reimbursement issues associated with the sharing of equipment, supplies, and personnel

(Stier & Goodman, 2007). Even the best emergency operation plan (EOP) can fail if the full scope of the disaster is not taken into consideration (Cashen, 2006). The effect of the disaster may be far reaching and beyond the scope of the EOP if it only addresses plans for the use of an alternative worksite such as emergency operations center (EOC). In continuity planning for pandemic influenza there is concern that simultaneous outbreaks of influenza would limit the ability of any jurisdiction to provide mutual aid, and up to a third of local government's workforce could be affected (Varghese, 2006). There is also a potential for disruption of critical community infrastructure such as transportation, commerce, utilities, and public safety. Such disruption may serve as a barrier to a response by public health or other responders (Varghese, 2006). According to Varghese, "Pandemic influenza is not primarily a disaster of public health concern. Rather, it is a disaster which threatens continuity of all segments of a community, including local government (2006, p. 5).

In summary, "Public health preparedness never stops. It is the very core of public health, and every person that works in the public health field needs to be prepared for what the day may bring – routine or extraordinary" (Hann et al., 2007). The literature review supports the need for continuity planning in public health, especially in maintaining the continuity of essential public health services during and after a disaster has occurred. Continuity planning not only enhances response but also strengthens recovery. Continuity planning has elements within a variety of response plans including BCP, COOP and COG. Continuity planning also incorporates elements of contingency planning in dealing with unforeseen events. It is not known to what extent continuity planning occurs among plans of preparedness and response by members of the NPHPC.

A challenge for all members of the NPHPC is being able to respond to a disaster if displacement occurs.

CHAPTER III

METHODS AND PROCEDURES

Introduction

Research for this study included a pilot and a research phase. The pilot phase provided the foundation for the research phase and included public health officials not included within the Northwoods Public Health Preparedness Consortium (NPHPC). The research phase was conducted in February, 2009. Public health officials who employed members of the NPHPC were surveyed during the research phase. The purpose of the pilot phase was to evaluate and assess the level of awareness and use of continuity planning among public health officials. The pilot phase also examined challenges maintaining continuity planning through the survey.

Theoretical Framework

Members of the NPHPC are generally in a leadership role within their public health agency. Public health officials who were identified as designated members had knowledge and aptitude that was not typical of general public health staff, since they are involved directly with consortia work and may also be involved with program evaluation within their own agencies. The public health officials belonged to a variety of public health disciplines and were credentialed with a variety of titles. According to the contact list of NPHPC participants provided by consortia staff, these titles included health officer, preparedness coordinator, emergency preparedness coordinator, community health

nursing supervisor, environmental health director, and regional director (M. K. Texidor, personal communication, January 16, 2009). Regardless of their title, the public health officials utilized in the present study are responsible for public health programming for their communities and all have served on the NPHPC of northern Wisconsin. Public health programming strategies related to response planning were shared among participants through their involvement in the NPHPC. Appendix C shows the types of response plans, including preparedness planning and pandemic response that have been developed by the NPHPC.

An ancillary purpose for this research was to raise an awareness of continuity planning in public health among public health officials in northern Wisconsin through the use of the *Continuity Planning in Public Health Survey* (CPPHS). The researcher was also concerned as to the existence of confounding interpretations of continuity planning. As seen in the previous chapter, the principles of continuity planning can be seen in contingency planning, BCP, COOP, and COG (Laye, 2002; Wallace and Webber, 2004: Cashen, 2006).

Subject Selection

Consortia members of the NPHPC, who served as the most informed members of their representative public health agencies, were sought as participants in this study. The target population was public health officials who worked for public health agencies and who were also members of the NPHPC. At the time this study was conducted, there were 23 identified member agencies of the NPHPC (M. K. Texidor, personal communication, January 16, 2009). One of these agencies was not selected for participation of the study as it was not directly involved with public health programming. One public health

official for each of the remaining 22 agencies was invited to participate. Respondents included both men and women and represented both local public health agencies and tribal public health care facilities.

Instrumentation

A one-sample survey design was used to complete the study. The data collection instrument was a 20-item survey known as the CPPHS. Responses to the survey items were designed to provide ordinal-level, non-paramedics statistics. For each item, respondents rated their reactions using a Likert-scale format. Responses were designed on a five-point scale where 1 = *strongly agree*, 2 = *agree*, 3 = *disagree*, 4 = *strongly disagree*, and 5 = *not applicable (N/A)*. The Kolmogorov-Smirnov (K-S) one-sample test was selected for analysis of the data. Normally, random sampling is a prerequisite for the K-S test, but in this case, all members of the population were used (n = 17). The 20 survey items of the CPPHS were designed to assess participants' awareness and use of continuity planning in public health (Appendix E for CPPHS items). Survey items 1–5 assessed participants' awareness and use of continuity planning. These items also assessed the continuity of public health services if displacement should occur, by highlighting the record keeping requirements of the HIPAA. Providing continuity of public health services if displacement should occur was the theme of survey items 6-10. Continuity planning within current public health programming and response plan tailored to incorporate public health services, such a flu pandemic planning, was also assessed in survey items 6-10. Survey items 11-15 were designed to examine the benefits and challenges of continuity planning specific to public health. Some of the benefits and challenges included record keeping and retrieval, data storage, and IT including

communications (Wallace and Webber, 2004; Cashen, 2006). Whether these elements were benefits or challenges was dependent upon the capacity of the public health agency, which was also assessed. Finally, survey items 16-20 assessed the extent to which the public health officials were currently incorporating continuity planning.

Demographic information was gathered on each of the participants without having respondents disclose their names. Demographic information included years of secondary education, employment title within the public health agency, years of employment in current position, and indication on the types of public health programs they were currently working with. Data related to public health programs provided nominal information of participation among the group. Other demographic data was also nominal and comments provided by respondents were listed and provided the researcher an opportunity for review and further commentary on continuity planning.

Development of the Survey

In order to gather data, the *Continuity Planning in Public Health Survey* (CPPHS) was developed by the researcher. The CPPHS served as an instrument for the collection of data, and also as a tool for evaluation. The CPPHS included 20 items that assessed continuity planning and provided an opportunity for participants to offer feedback. A Likert-scale format was used for each survey item. The survey items were constructed to answer the researcher's three research questions related to continuity planning within public health. The first of the three research questions was, to what extent are most public health agencies in northern Wisconsin prepared to respond to an emergency if displaced from their agency or operation center? To answer this question the researcher chose statements 1-5 of the CPPHS, which assessed the public health officials' awareness

of continuity planning terminology related to the HIPAA and use of continuity planning within preparedness planning.

The second question assessed the extent to which continuity planning was used by member agencies of the NPHPC when drafting emergency response plans or plans of preparedness, such as a flu pandemic, and the incorporation of the HIPAA. Survey items 6-10 of the CPPHS assessed awareness of possible uses for continuity planning in public health programming beyond disaster response or bioterrorism (BT) preparedness planning, such as use in flu pandemic planning. Finally question three, assessed the extent to which member agencies of NPHPC were able to meet information technology (IT) challenges related to record storage and retrieval in order to maintain essential public health services during displacement. Survey items 11-15 explored the benefits and challenges of using continuity planning in public health through record keeping, data storage, and information technologies (IT). Survey items 16-20 assessed the extent to which the member agencies of the NPHPC were using continuity planning. Cashen and other authors, have stated that the use of continuity planning principles will ensure essential public health services are provided during the response and recovery phases, especially if displacement should occur (Cashen, 2006; Webber and Wallace, 2003; Landesman, 2001).

Pilot Phase

Once approval was granted by the University of Wisconsin-La Crosse Institutional Review Board (IRB) an initial version of the CPPHS was given to a small sample of participants in order to address three distinct purposes.

These purposes included:

1. To assess awareness and use of continuity planning among public health leaders in Wisconsin.
2. To measure the extent to which continuity planning was already being implemented within public health programming
3. Finally, to gain insight from the participants. Comments from participants were used to make adjustments to questions and survey items, which were later utilized during the research phase.

Five Wisconsin public health officials from outside the study region were selected as participants for the pilot study. Three of the participants were health officers from county (local) health departments, one participant was a health officer from a city health department and one participant was a public health leader for a Native-American tribe. The group was comprised of three (3) men and two (2) women.

All survey items were scored using a Likert-scale format. The numerical responses were manually calculated by the researcher using frequency counts and cross-tabulated percentages. Comments were reviewed by the researcher to further assess awareness and meaning of the survey items. As a result of the pilot test, some changes in the CPPHS were made including the addition of a definition for continuity planning as some comments from the respondents indicated confusion regarding the meaning of the term. There was no additional follow-up or post-test with participants. Findings of the pilot phase suggested that continuity planning was seldom used in public health. Seventy five percent of respondents indicated continuity planning did not lend itself easily to public health planning, and only 20% of respondents said their agencies used continuity

planning during daily activities. These findings provided momentum for the research phase.

Research Phase

The research instrument retained the 20 original statements that were used in the pilot study but also included added space for final comments. Additionally, comment boxes where provided for each survey item (Appendix E for CPPHS evaluation tool). A listing of known public health programming was also included in which respondents indicated programming currently being done within their agencies. The CPPHS served as the primary evaluation tool for the collection of data. The purpose of the survey was to make inferences concerning the existence and assess awareness and use of continuity planning in public health programming for the northern region of Wisconsin, based on the input of public health officials whose agencies served as member contacts within a system of public health consortia of Wisconsin. The member public health agencies of the NPHPC were identified as the population for the study. The NPHPC is one of many public health consortia located within Wisconsin. Ordinal-level data was collected via the CPPHS which was administered through electronic correspondence and, where needed, was followed up with an individual teleconference for clarifying responses. The study surveyed the population of public health agency representatives of the NPHC. These officials were identified by the NPHC as the designated member for contact. .

Data Collection

The researcher contacted all designated members of the representative public health agencies of the NPHPC by e-mail prior to beginning the research phase. E-mail addresses were made available by the NPHPC through a contacts list which was provided

by consortia staff. Within one week of the initial e-mail, the researcher provided each member with a parcel post which contained a letter of invitation, the CPPHS with instructions, and a postage-paid addressed envelope to return the completed CPPHS to the researcher. Participants were allowed two weeks to review and complete the CPPHS. One week after deployment of the parcel posts, a second e-mail message was sent, requesting the return surveys for those who had not yet responded. The response rate was 17 out of 22 (77.3%). Fifteen were returned via U.S. Postal Service (88.2%) and two were returned electronically via the Internet (11.8%).

Statistical Analysis

Data were analyzed using the *Statistical Package for the Social Sciences, version 17.0* (SPSS). Data collected included nominal responses describing the respondents' demographics and ordinal responses for the 20 items in the survey. A K-S one-sample test was used to provide nonparametric analyses of ordinal-level data that provided a goodness-of-fit test on the distribution of responses provided (Garson, 2008). A two-tail exact test was preformed as part of the K-S nonparametric analysis, which determined statistical significance around the K-S "Z" variable which is similar to the median of the distribution of the variable (SPSS, 2009). The value of the two-tail exact test is also known as the "D" value, which is the expected variable based on sample size and statistical significance (Siegel & Castellan, Jr., 1988). Alpha (α) was set at .05.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

Before administrating the *Continuity Planning in Public Health Survey* (CPPHS) to the primary research population, feedback provided by the pilot study population was taken into consideration and resulted in minor changes being made to the research tool (CPPHS). These changes included adding a definition of continuity planning to the CPPHS. While it was the original intent of the researcher to gauge the awareness of the term, continuity planning, feedback from the pilot study along with input from the thesis committee members suggested that a definition of the term would help clarify its principles to current public health programs, practice and response plans. An additional opportunity to offer comments about survey questions was provided by the researcher with the addition of comment boxes which followed each question. Small changes were also made to some of the survey questions regarding syntax. These changes provided further clarification related to assessing the use of continuity planning within public health. Finally, a method to gather demographic data about the types of public health programming provided by the agency representatives of the Northwoods Public Health Preparedness Consortium (NPHPC) was added to the CPPHS, to provide possible insight into the use of continuity planning. The CPPHS retained its original structure of twenty items as described within the methodology of Chapter III.

Data collected during the research phase were used to answer research questions which sought to assess awareness and use of continuity planning. Participants were asked to respond to items within the CPPHS. Participants were agency representatives of the NPHPC. The three research questions sought to assessed: 1) awareness of continuity planning and implementation within public health by being better prepared to provide for essential services if displacement should occur, 2) use of continuity planning within plans of preparedness – such as flu pandemic planning, and 3) assessing the participant's ability to meet challenges and gain benefits of continuity planning and as a result build recovery capacity within public health. The research phase of this study occurred during March, 2009 and involved participants responding to items related to the awareness, implementation, and maintenance of continuity planning within public health agencies of northern Wisconsin. Continuity planning can be exceptionally beneficial as an infrastructure after displacement has occurred (Cashen, 2006). Displacement occurs when the normal place of business for an agency is destroyed or temporarily uninhabitable as a result of a disaster (Kelly et al., 2005; Klitzman & Freundenberg, 2003). During the research phase of this study, data were collected to: 1) determine if essential public health services could be maintained if displacement occurred, 2) confirm the presence of continuity planning in public health programming, response plans, and recovery plans, and 3) verify that challenges present in the use of information technology (IT) have not curtailed implementation of continuity planning within member public health entities of the NPHPC. It has been shown that the lack of IT can impede the implementation and maintenance of continuity planning (Laye, 2002; Wallace & Webber, 2004).

A total of 17 surveys were collected from respondents who were employed by representative agencies of the NPHPC. In this study all available representatives from the entire population of member agencies of the NPHPC were used. Variables were entered into data sets as defined by parameters (nominal-level and also ordinal-level) of the software used for analysis. Data were analyzed using the *Statistical Package for the Social Sciences* Statistics (SPSS) version 17.0. Demographic data collected were nominal-level, while data collected from the survey items of the CPPHS were ordinal-level. Response data from items provided within the CPPHS were coded and weighed using a Likert-scale format. Because of the type of data collected, nonparametric statistics were used. Specifically nonparametric statistical analyses were completed on variables with the use of a one-sample Kolmogorov-Smirnov goodness-of-fit test (K-S test). Variables included the mean for each of the tallied Likert-scale responses for each statement, frequency of occurrence for each Likert-scale response to each statement, and the probability of distribution (p). Demographic data submitted by the respondents were tallied, and means for years of post secondary education and for years within their current position, reflecting experience, were indicated. Information regarding the public health professional title held by the respondents was also gathered. Current public health programs within member agencies was tallied and described by using frequency of occurrence by participation. Feedback provided on the surveys was recorded and included within this research paper. It was later used to help further explain differences in answers provided by the respondents.

Participants

The research study was conducted in February and March, 2009. The respondents were "designated members" of public health agencies that were representatives of the NPHPC. Identification of designated members came from a listing of contacts provided by staff of the NPHPC. There were twenty-one representative public health agencies, one affiliate of the Wisconsin Hospital Emergency Preparedness Program Region 2 (WHEPP), and one member from the Northern Regional Division of Health office who were identified as possible participants within the NPHPC (N=23). All twenty-three participants were sent the CPPHS through the U. S. Postal Service. One week following the survey distribution via postal mail, a courtesy contact was provided via e-mail by the researcher to remind members to return their CPPHS. One member declined to participate in the research study and five other members failed to return the CPPHS.

The seventeen respondents consisted of two men (n = 2) and fifteen women (n = 15). All respondents worked within public health in a managerial or supervisory capacity and included: eleven health officers (64.7%), two health officer/director (11.8%), one nursing supervisor (5.9%) and three respondents who indicated "other" (17.6%). "Other" professional titles held by respondents included: environmental health director, preparedness coordinator, and regional director. The sample showed that post-secondary education ranged from four years to eleven years, with a mean of 5.59 years. Respondents had worked within their current positions a mean of 10.2 years, with the range being 4 months to 35 years. All seventeen respondents completed the CPPHS (Appendix E for CPPHS).

Public Health Programming within the NPHPC

Study respondents were asked to indicate the types of public health programming conducted by their agencies. The nominal-level data were collected via the instrument CPPHS, tallied, and described statistically by frequency of participation among respondents (Table 1). Public health programs with the largest participation among member agencies included communicable disease (94.1%) and public health/BT preparedness (94.1%) (Table 1). Laboratory services (17.6%) were the most infrequently provided public health program (Table 1). Public health programming for tribal health issues of Native American tribes located within the defined area of the NPHPC occurred in 23.5% of the agencies (Table 1). This occurrence is believed to have been under reported within the NPHPC, because three out of the five non-responding agency representatives were associated with tribal nation public health agencies.

Only 35.3% of respondents indicated that their agencies were involved with other types of public health services or programming. Respondents who selected "other" for types of public health programming not included in the CPPHS, gave examples of the following types of programs: jail health (2), Wisconsin Well Women Program (WWWP) (1), Health check (1), prevention (1), Living with chronic conditions (1), dining with diabetes (1), Wisconsin Association for Alcohol and Other Drug Abuse (AODA) for community health improvement process (CHIP) (1), obesity for CHIP (1), and consultation and technical support to local health departments, tribes, and public health (1). Public health programming among the respondents was fairly universal. Fewer than half of the agencies participate in tribal health issues (23.4%), reproductive health (23.5%), laboratory services (17.6%), and dental programs (47.1%). Reasons for these programs

Table 1

Frequency of Public Health Programs Practiced by CPPHS Respondents (n=17)

Public health programs	Frequency of practice
Accident prevention	10 (58.8%)
Communicable disease	16 (94.1%)
Community health	14 (82.4%)
Dental programs	8 (47.1%)
Environmental health	14 (82.4%)
Home visitation	13 (76.5%)
Immunizations	15 (88.2%)
Laboratory	3 (17.6%)
Maternal child health	15 (88.2%)
Other programs	6 (35.3%)
Public health Preparedness/BT	16 (94.1%)
Reproductive health	4 (23.5%)
School health	10 (58.8%)
Tobacco	15 (88.2%)
Tribal health issues	4 (23.5%)
WIC	11 (64.7%)

not being included in public health agency services were not provided. Reasons may include lack of special populations within communities, larger compared to smaller health departments, and limitations in budget and funding of programs.

Survey Items Concerning Continuity Planning

There were twenty survey items of the CPPHS related to the practice and principles of continuity planning (Appendix E for CPPHS). Respondents were asked to rank their responses using Likert-scale model format of one to five with 1 = *strongly agree*, 2 = *agree*, 3 = *disagree*, 4 = *strongly disagree*, and 5 = *not applicable (N/A)*. The mean value for each survey item was used for analysis, and calculated from the weighted values 1–4 from all responses provided, to gauge an overall response to the survey item. The mean value for each survey item was also broken down into two groups. The first group (n = 14) were respondents who represented local public agencies of the NPHPC. The second, and much smaller group, (n = 3) were respondents who represented tribal nation public health agencies. For the purposes of analysis, responses of N/A and no-response were not included in analysis. This provided an expected 25 % frequency of each response type (strongly agree, agree, disagree, and strongly disagree) for each survey item. This methodology allowed the researcher to place a quantitative value on qualitative data that were ordinal-level. The variables gathered were entered into SPSS data-tables and analyzed using the K-S one-sample test. The K-S one-sample test compares expected with observed response percentages for each survey item.

The K-S test focuses on the largest deviation (*D*) among the sampling distribution (Siegel and Castellan, 1988). The K-S test is normally reported as a value of "D", although the use of SPSS automatically converts the value of *D* into *Z*. The value of *Z* is dependent upon *n*. In addition, a test of significance was computed using an exact two-tailed test (SPSS, 2009). The exact two-tailed method is used when the sample size (n) is less than 50 and there are no other test results available for comparison (SPSS, 2009).

The exact two-tailed test of significance, tests the probability of getting a result or value of *D*, or in this case Z which is greater than what is expected (Garson, 2008). With only four responses possible for each survey item, the expected percentage per response is 25%. Individual responses per survey item were noted as being statistically significant if the value of p was equal to or less than .05. The level of significance (α) was set at .05. Survey items were aligned with each of the three research questions that assessed awareness and use of continuity planning. The preponderance of information (i.e., respondent commentary and p levels of the responses) enabled the researcher to qualify the trends in the responses. Survey items were viewed as not having trends relevant to the key aspects of the research question if the preponderance of responses was indicative of disagreement or no statistical significance was indicated. Survey items were grouped to address each one of the three research questions in the following fashion: research question 1 (RQ1): CPPHS items 1-5 and CPPHS items 16-20; research question 2 (RQ2): CPPHS items 6-10; and research question 3 (RQ3): CPPHS items 11-15. There were primarily two types of public health agencies involved with the study. The two types of public health agencies were those which represented county operated local public health agencies (LPHA) and tribal nation public health agencies (TNPHA). There were no major differences among the findings from each set of data.

Findings

Research Question One (RQ1)

The first research question asked:

To what degree are public health agencies in northern Wisconsin prepared to respond to an emergency and maintain essential services if displacement from their agency should occur?

This RQ was addressed in two parts. Part one of RQ1 assessed awareness of continuity planning by respondents who were employed by representative agencies of the NPHPC. Continuity planning equates directly to being prepared to respond to an emergency (Cashen, 2006; Landesman, 2001). To assess the degree of occurrence items 1–5 of the CPPHS were aligned to support the premise of being able to respond to an emergency as these items were concerned with defining continuity planning within public health. Items 1-5 included:

- Item 1. "I understand the meaning of the term *continuity planning*." Mean value was calculated from the weighted values 1–4 from all responses, and for this item was 1.53. As a whole, the largest number of responses (n = 17) by respondents were "agree" (52.9 %), indicating that they had an awareness of continuity planning. Probability (p = .023) indicated statistical significance as it occurred at <.05. For this survey item respondents chose either "*strongly agree"* (47.1%) or "*agree"* (52.9%) which exceeded the 25% expected frequency for each possible response. When looked at separately, LPHA respondents indicated 50% response rate for "strongly agree" as well as "agree". Each of these response rates exceeded the expected 25%. TNPHA respondents chose "agree" as the most frequent response (66.7%) followed by "strongly agree" (33.3%). Probability (p = .070 and p = .637 respectively) indicated did not occur (<. 05). The responses to this survey item support a higher degree of awareness of continuity planning (Appendix E – CPPHS, Tables 2 and 3).

- Item 2. “Continuity planning plays an important role in public health.” (The mean value for this item was 1.53, for the group of respondents as a whole. “Agree” was the response (n = 17) with highest occurring frequency (52.9%). Respondents indicated that continuity planning has an important role in public health. This value was statistically significant with a probability of .023 (p = .023). When taken separately, LPHA respondents chose either “strongly agree” (42.9%) or “agree” (57.1%). TNPHA respondents chose either “strongly agree” (66.7%) or “agree” (33.3%). Statistical significance occurred among responses provided by LPHA respondents (p = .032) and did not occur in TNLPA responses (p = .637). Overall responses exceeded expectancy of 25 % in that only “strongly agree” or “agree” were chosen. The responses to this survey item support a higher degree of awareness of continuity planning (Appendix E – CPPHS, Tables 2 and 3).

Item 3. “Continuity planning can be used to meet the Health Insurance Portability and Accountability Act (HIPAA) requirements in protecting medical records.” (The mean value was 2.0. There were only 13 respondents who responded to this survey item. “Agree” was chosen as a response by most respondents (52.9%). Responses did not show statistical significance with a probability of occurrence of .068 (p = .068). The expected frequencies of occurrence for the response of “agree” (52.9%) exceeded the expected 25%. There seemed to be some discord among respondents as to the role of continuity planning and its relationship to HIPAA requirements, as indicated by responses of “disagree” (11.8%), and “strongly agree” (11.8%).

Table 2

Responses from all Respondents for CPPHS Items

CPPHS item (n)	Mean value	Standard deviation	Minimum. value	Maximum value
1. I understand the meaning of the continuity planning (CP)				
17	1.53	.514	1	2
2. CP plays an important role in public health				
17	1.53	.514	1	2
3. CP can be used to meet HIPAA requirements				
13	2.00	.557	1	3
4. CP can be used extensively in emergency preparedness planning				
17	1.59	.712	1	3
5. CP can assist public health in providing a response, even during displacement				
17	1.41	.507	1	2
6. Record keeping is the only reason to use continuity planning				
17	3.35	.493	3	4
7. CP has limitations within public health				
17	2.35	.493	2	3
8. Most public health preparedness/recovery plans are based upon CP				
16	2.00	.632	1	3
9. Public health consortia use CP in public health programs				
6	2.06	.680	1	3

10. Flu pandemic is a public health arena well suited for CP					
	17	1.47	.514	1	2
11. Having accessible records					
	16	1.88	.619	1	3
12. Record keeping and retrieval is a function of CP					
	17	1.94	.429	1	3
13. Storage and retrieval of records is dependent upon IT					
	17	1.82	.529	1	3
14. My public health agency utilizes IT for the purpose of record keeping					
	17	1.76	.437	1	2
15. My public health agency has plans and IT					
	17	2.06	.659	1	3
16. My public health agency has the technological capacity to support CP					
	16	2.19	.655	1	3
17. My public health agency is involved with CP					
	17	1.76	.437	1	2
18. HIPAA requirements should be the basis of CP in public health					
	16	2.81	.655	2	4
19. I fully understand CP as to its implementation with public health					
	17	2.29	.722	1	4
20. My consortium should do more to promote CP in public health					
	15	2.36	.497	2	3

Among LPHA respondents there were three non-responses (n = 11) and there was one non-response among TNPHA respondents (n = 2). "Agree" was the only response indicated by TNPHA respondents (66.7%). The expected frequency was exceeded for the response. "Agree" was chosen by 50% of the LPHA respondents which exceeded the expected frequency of response, with "strongly agree" and "disagree" being indicated by the remainder of the group (14.3% for each response type). Because the distribution had no variance for this item's variable, the K-S one sample test could not be performed for responses provided by TNPHA. Statistical significance did not occur among responses provided by LPHA respondents (.173). The responses to this item had no statistical significance but did support a higher degree of awareness of continuity planning.

- Item 4. "Continuity planning can be used extensively in emergency preparedness planning." The mean value for this item was 1.59. All responses from respondents (n=17) indicated "strongly agree" regarding continuity planning being used extensively in emergency preparedness planning (52.9%). Statistical significance was indicated at a p value of .042, with expected frequency response being exceeded.

  Taken separately, responses of LPHA respondents indicated a preference for "strongly agree" (57.1%) for this item, which exceeded the frequency for expected outcome. Other responses included "agree" (28.6%) which slightly exceeded the frequency for expected outcome and "disagree" (14.3%). Both responses from TNPHA exceeded the frequency for expected outcomes with "strongly agree" (33.3%) and "agree" (66.7%). Statistical significance did not occur among responses from either group, when taken separately

(LPHA = .052 and TNPHA = .637). The responses to this item support a higher degree of awareness of continuity planning.

- Item 5. "Continuity planning can assist public health in providing a response to an emergency situation, even during periods of displacement." Mean value was calculated from the weighted values 1–4 from all responses, and for this item was 1.41. The highest responses from all respondents (n=17) indicated "strongly agree" (58.8%) that continuity planning can assist public health in providing a response, even during displacement. Responses resulted in statistical significance with a probability of occurrence of .010 (p = .010). Expected frequencies for responses were exceeded ("strongly agree" = 58.8% and "agree" = 41.2%).

  Separately, responses by LPHA respondents exceeded the frequency of expected outcomes with "strongly agree" (64.3%) and "agree" (35.7%). Responses by TNPHA were similar and also exceeded the frequency of expected outcomes with "strongly agree" (33.3%) and "agree" (66.7%). Statistical significance was not present for TNPHA responses (.637) but was present for LPHA responses (.013). The responses to this item support a higher degree of awareness of continuity planning.

Survey items 1-5 support the first part of RQ1, which assessed whether or not respondents of the CPPHS, who were also employed by representative agencies of the NPHPC, had awareness of the meaning of continuity planning in order to be prepared to respond to an emergency. All respondents had developed plans of preparedness, and communicable disease reporting which is a mandated service for all public health agencies in Wisconsin. Comments for this grouping of survey items from the CPHPS included comments that some respondents had never used the term, "*continuity*

Table 3

Kolmogorov-Smirnov (K-S) One-Sample Test Results for CPPHS Items Aligned with Research Question One (RQ1)

Survey item (n)	K-S z	*D* value	Clarifies elements of awareness related to RQ1
1. I understand the meaning of the continuity planning (CP)			
17	1.440	.023	Yes
2. CP plays an important role in public health			
17	1.440	.023	Yes
3. CP can be used to meet HIPAA requirements			
13	1.416	.068	Yes
4. CP can be used extensively in emergency preparedness planning			
17	1.340	.042	Yes
5. CP can assist public health in providing a response, even during displacement			
17	1.566	.010	Yes
16. My public health agency has the technological capacity to support CP			
16	1.201	.090	Yes
17. My public health agency is involved with CP			
17	1.936	.001	Yes
18. HIPAA requirements should be the basis of CP in public health			
16	1.201	.090	No

19. I fully understand CP as to its implementation with public health			
17	1.218	.082	No
20. My consortium should do more to promote CP in public health			
14	1.521	.013	Yes

planning" within their public health experience and other respondents had limited experience with the HIPAA.

Part two of RQ1 assessed the maintenance of essential services of public health through the use of continuity planning. Implementation of continuity planning is believed to sustain essential services if displacement should occur (Cashen, 2006). To assess the degree of occurrence, items 16-20 of the CPPHS were aligned to support the premise of being to provide essential services of public health if displacement should occur. Items 16-20 included:

- Item 16. "My public health agency has the technological capacity to support continuity planning." The mean value was calculated with weighted scale responses 1–4, and for this item were 2.19, for all responses. The highest frequency of response for this survey item was "agree" (52.9%), by respondents (n = 16). There was no statistical significance with a probability of occurrence at .090 (p = .090), even though the expected frequency of response was exceeded. Other responses included "strongly agree" (11.8%) and disagree (29.4%). .

  When looked at separately, LPHA respondents indicated a 50% response rate for "agree" and exceeded the frequency for expected outcome. "Disagree" (35.7%) was the second most indicated response by LPHA respondents, which also exceeded the

frequency of expected outcome. "Strongly agree" as a response by LPHA respondents did not exceed the frequency of expected outcomes (14.3%). TNPHA respondents (n = 2) chose "agree" as the most common response (66.7%). Statistical significance was not present among responses by LPHA respondents (.240) and because the distribution had no variance for this item's variable the K-S one sample test could not be performed for responses provided by TNPHA. The responses to this item did support a higher degree of awareness of continuity planning in supporting essential services if displacement should occur.

- Item 17. "My public health agency is involved with continuity planning." The mean value for this item was 1.76. As a group respondents (n = 17) chose "agree", over all other responses (76.5%), which was indicative that their representative agencies were involved with continuity planning. Statistical significance for all responses was indicated at a *p* value of .001 (p = .001), with the frequency of expected outcome for "agree" being exceeded (76.5%).

  LPHA respondents' responses exceeded the frequency of expected outcomes, with "agree" being chosen (71.4%) most often and "strongly agree" being the only other response given (28.6%). All TNPHA respondents chose "agree" (100%), which also exceeded the frequency for expected outcome. Statistical significance was present among responses by LPHA respondents (.005) and because the distribution had no variance for this item's variable the K-S one sample test could not be performed for responses provided by TNPHA. The responses to this item support a higher degree of awareness of continuity planning in supporting essential services if displacement should occur.

- Item18. "HIPAA requirements should be the basis of continuity planning in public health." This item had a mean value of 2.81. The most common response from all respondents (n=16) was "disagree" (52.9%). Statistical significance for this survey item was not present
  (p = .090).

  Responses of "agree" (28.8%) and "disagree" (57.1%), exceeded the frequencies of expected outcome for LPHA respondents. "Strongly disagree" (7.1%) chosen by LPHA respondents did not. Responses by TNPHA respondents, "strongly agree" (33.3%), "agree" (33.3%), "strongly disagree" (33.3%) also exceeded the frequencies of expected outcomes. TNPHA respondents indicated more often, that requirements of the HIPAA should be the basis for continuity planning (66.6%), while only 28.8% of LPHA respondents indicated the same with their responses. Statistical significance was not present among LPHA responses (.073) or TNPHA responses (1.00). Although 29.4% of all respondents indicated that they "agree" to this survey item, overall responses to this item did not support a higher degree of awareness in supporting essential services if displacement should occur.
- Item 19. "I fully understand continuity planning and its implementations within public health." The mean value was calculated at 2.29. "Agree" had the highest frequency of occurrence among all responses (52.9%). Statistical significance was not indicated at a p value of .082, although expected frequency response was being exceeded. The reason statistical significance did not occur may have been due to the indication of "disagree" (29.4%), among all responses.

LPHA respondents indicated 50% response rate for "agree" exceeded the frequency for expected outcome. "Disagree" (35.7%) was the second most indicated response by LPHA respondents, which also exceeded the frequency of expected outcome. "Strongly agree" as a response by LPHA respondents did not exceed the frequency of expected outcomes (14.3%). TNPHA respondents chose "agree" most often (66.7%); also indicated was "strongly agree" (33.3%). Statistical significance was not present among responses by LPHA respondents (.240), or responses by TNPHA respondents (.637). Overall, responses to this item did not support a higher degree of awareness in supporting essential services if displacement should occur.

- Item 20. "My consortium should do more to promote continuity planning in public health." The mean value for this item was calculated at 2.53, for all responses. There were only two types of responses provided by respondents (n = 14) to this item. "Agree" had the highest frequency of occurrence (52.9%) and other responses indicated "disagree" (29.4%), which exceeded the frequency of expected outcomes. Statistical significance was indicated at a p value of .049 (p = .049), and while some expected frequencies for responses were exceeded ("agree" = 52.9%), others were not (29.4%).

  Responses by TBPHA (n = 2) were in disagreement with one another, "agree" (33.3%) and "disagree" (33.3%), each exceeded the frequencies of expected outcomes. LPHA respondents (n = 12) were similar but not as pronounced with responses indicating "agree" (57.1%) and "disagree" (28.6%). Responses from LPHA respondents also exceeded frequencies of expected outcomes. Statistical significance did occur among LPHA responses (.021) and did not occur among

TNPHA responses (.999). There were a total of three non-respondents (17.7%) to this survey item. The responses to this item support a higher degree of awareness in supporting essential services if displacement should occur. (Tables 2 and 3).

Deficiencies in awareness and use of continuity planning was verified through the respondents' awareness and use of continuity planning, including meeting the standards of the HIPAA and preparedness planning. Respondents showed they possessed an awareness of continuity planning thus indicating key elements addressed by RQ1.

Research Question Two (RQ2)

The second research question asked:

To what degree is continuity planning taken into consideration by public health agencies in northern Wisconsin, when drafting emergency response plans or plans of preparedness? RQ2 also asked, is there a tendency for plans that address flu pandemic response and the HIPAA to be more applicable to continuity planning?

To assess the degree of occurrence items 6–10 of the CPPHS were aligned to support the premise of being aware of continuity planning within emergency response plans and plans of preparedness, including flu pandemic plans and plans of recovery including those for the HIPAA. Flu pandemic planning was also used to assess the use of continuity planning. It is believed that public health agencies would serve as lead responder (Landesman, 2001). Plans for flu pandemic have already been developed and drafted as a contract deliverable within public health consortia in Wisconsin (Appendix C NPHPC key documents). Items 6-10 included:

- Item 6: "Record keeping is the only reason to use continuity planning." The mean value was calculated with weighted scale responses 1–4, and for this item were 3.35, for all responses. All respondents (n = 17) either selected "strongly disagree" (35.3%) or "disagree" (64.7%), which was the highest response to the statement that indicated record keeping was the only reason for continuity planning.

  Responses from LPHA respondents, "strongly disagree" (35.7%) and "disagree" (64.3%), and responses from TNPHA respondents, "strongly disagree" (33.3%) and "disagree" (66.7%), followed very similar trends. All responses exceeded frequencies of expected outcomes (25%). Statistical significance was not present among TNPHA responses (.637) and was present among responses provided by LPHA respondents (.013). Although statistical significance was present (p = .004), and responses exceeded the frequency of expectation, this item did not support awareness that continuity planning can support plans of preparedness.

- Item 7: "Continuity planning has limitations within public health." The mean value for these items was calculated at 2.35. Many of the respondents (n = 17) did agree that there were limitations to continuity planning within public health (64.7%) which was the highest percentage of responses. All other respondents disagreed with this item (35.3%). Both responses exceeded the frequency of expectation and statistical significance was also present (p = .004). Responses among both groups indicated either agreement or disagreement to continuity planning having limitations within public health. LPHA respondents selected "agree" (64.3%) more often than

Table 4

Kolmogorov-Smirnov (K-S) One-Sample Test Results for CPPHS Items Aligned with ResearchQuestion Two (RQ2)

Survey item (n)	K-S z	*D* value	Clarifies elements of awareness related to RQ2
6. Record keeping is the only reason to use continuity planning (CP)			
17	1.691	.004	No
7. CP has limitations within public health			
17	1.691	.004	No
8. Most public health preparedness/recovery plans are based upon CP			
16	1.250	.069	Yes
9. Public health consortia use CP in public health programs			
16	1.146	.117	Yes
10. Flu pandemic is a public health arena well suited for CP			
17	1.440	.023	Yes

"disagree" (35.7%), as did TNPHA respondents who selected "agree" (66.7%) over "disagree" (33.3%). For all responses the frequencies for expected outcomes were exceeded. Statistical significance did occur within LPHA responses (.013) and did not occur within TNPHA responses (.637). As a result this item did not support awareness that continuity planning can support plans of preparedness.

- Item 8: “Most public health preparedness/recovery plans are based upon continuity planning.” The mean value for this item was 2.00 for all responses provided. Most respondents (n = 16) responded with “agree” (58.8), that public health preparedness plans were based upon continuity planning. Another 17.6 % of all respondents “strongly agreed” with this item. There was also disagreement among respondents (17.6%), but only “agree” had a frequency of expectancy that was exceeded.

  “Agree” (66.7%) was the only response selected by TNPHA respondents who responded (n = 2). “Agree” (57.1%) was also the predominant response provided by LPHA respondents. Like the response provided by TNPHA respondents it did exceed the frequency of expected outcome. Other LPHA respondents chose “strongly agree” (21.4%) and “disagree” (21.4%). Statistical significance was not present among responses by LPHA respondents (.262) and because the distribution had no variance for this item’s variable the K-S one sample test could not be performed for responses provided by TNPHA. There was no statistical significance (p = .069) among all responses, yet this item did support awareness that continuity planning can support plans of preparedness. The combination of these factors lead to this item supporting elements of awareness that support awareness that continuity planning can be used to support plans of preparedness.
- Item 9: “Public health consortia use continuity planning in public health programs.” This item had a mean value of 2.06 for all responses. Respondents (n = 16) choose “agree” as the highest response for this item (52.9%). No other frequency of expectation was exceeded. Statistical significance was not present (p = .117). All other respondents indicated a strong agreement (17.6%) to this item.

"Agree" (57.1) had the largest response rate among LPHA respondents, which exceeded the frequency of expected outcome for response. "Agree" (33.3%) was one of only two responses provided by TNPHA respondents (n = 2). This response too exceeded the frequency for the expected outcome. Other responses provided by LPHA respondents included "strongly agree" (21.4%) and "disagree" (21.4%). "Disagree" (33.3%) was also indicated by the remaining TNPHA respondent, which exceeded the frequency for the expected outcome. Statistical significance was not present among responses by TNPHA respondents (.999) or LPHA respondents (.262). Overall, the majority of all responses indicated awareness that continuity planning supports plans of preparedness.

- Item 10: "Flu pandemic is a public health arena well suited for continuity planning." The mean value for all responses to this item was1.47. Responses from all respondents (n = 17) indicated strong agreement (52.9%) to this item, with another 47.1% of responses indicating "agree". In both cases, frequency of expectation was exceeded and statistical significance was present (p = .023).

  There was no disagreement indicated by responses from LPHA respondents and TNPHA respondents. LPHA respondents indicated "strongly agree" (57.1%) or "agree" (42.9%) to the statement that flu pandemic is a public health arena well suited for the use of continuity planning. TNPHA respondents indicated "strongly agree" (33.3%) and "agree" (66.7%) to the same statement. All responses from both groups exceeded the frequencies for expected outcomes. Statistical significance was not found among responses by TNPHA respondents (.637) and was present among responses provided by LPHA respondents (.032). Trends were seen among all

responses which showed an awareness was present that continuity planning supports plans of preparedness, especially plans related to flu pandemic planning. (Table 4).

Computed means for items 6-10 of the CPPHS had a range of 3.35 to 1.47 (Table 2). The overall mean for the grouping of these items was 2.25, suggesting that respondents agreed with the items overall. Standard deviations provided further confirmation of agreement among respondents and ranged from .680 to .493 (Table 2). Responses by respondents, for this group of survey items aligned with RQ2 did reflect elements of awareness that continuity planning can support plans of preparedness. Items that did not show support may prove to be barriers in the implementation of continuity planning within public health as they provide connotations that continuity planning has limitations within public health, and also that record keeping is not an important function of continuity planning as suggested by Wallace and Webber (2004). Comments provided by respondents indicated that some respondents were not familiar with the HIPAA. In regards to response plans, some respondents believed that they did contain elements of continuity planning and that the plans went beyond the role of response and included recovery. A comment related to flu pandemic planning hinted at continuity planning, in that a pandemic occurs over time and thus the need for continuity planning. Respondents overall showed they possessed an awareness of continuity planning related to key elements of plans of preparedness including plans which address the HIPAA and flu pandemic plans, addressed by RQ2.

Research Question Three (RQ3)

The third research question asked:

To what degree are public health agencies in Wisconsin able to meet the inherent challenges of information technology (IT) related to record storage and retrieval in order to maintain essential public health services during displacement?

Awareness of benefits and challenges through the use of continuity planning in public health formed the premise of RQ3. To assess the awareness that challenges and benefits were related to IT, record keeping, data storage, communication and recovery, items 11–15 of the CPPHS were aligned to the RQ3. Items 11–15 included:

- Item 11: "Having accessible records is important in providing an immediate response by public health, during times of crisis." The mean value was calculated for this item from all responses, with weighted scale responses 1–4, was 2.06. While there was wide range of responses provided to this statement, respondents (n = 16) indicated that "agree" (58.8%) was the highest response, in having accessible records to provide an immediate public health response after a disaster. Statistical significance was less than <.05 (p = .024), and expected frequency outcomes were not exceeded for any other response except "agree" ("strongly agree" = 23.5%, "disagree" = 11.8).

  Responses from LPHA were: "strongly agree" (28.6%), "agree" (57.1), and "disagree" (7.1). Responses indicating "strongly agree" and "agree" exceeded frequencies for expected outcomes. Responses from TNPHA were: "agree" (66.7%) and "disagree" (33.3%). All responses from TNPHA respondents exceeded frequencies for expected outcomes. Statistical significance was not present for either LPHA responses (.073) or TNPHA responses (.637). Collectively responses to this item support a higher degree of awareness of meeting the inherent challenges of information technology (IT) related to record storage and retrieval in order to

maintain essential public health services during displacement, as related to the constructs of RQ3.

- Item 12: "Record keeping and retrieval is a function of continuity planning." The mean value calculated for this item was 1.94. The highest degree of response to this item, from all respondents, occurred with "agree" (82.4%). The frequency of expected outcomes (25%) was exceeded by this response (82.4%). Other responses that were provided by all respondents did not exceed expected frequency outcomes ("strongly agree" = 11.8% and "disagree" = 5.9%). Statistical significance was present with p = .002.

  All TNPHA respondents chose "agree" (100%) for this survey item. Their response far exceeded the frequency for expected outcome for this item. Responses from LPHA respondents were varied with "strongly agree" (14.3%), "agree" (78.6%), and "disagree" (7.1) being selected. Only the response of "agree" by LPHA respondents exceeded the frequency of expected outcome for this item. Statistical significance was observed for LPHA responses and because the distribution had no variance for this item's variable the K-S one sample test could not be performed for responses provided by TNPHA. The responses to this item also support a higher degree of awareness in meeting the inherent challenges of information technology (IT) as related to record storage and retrieval in order to maintain essential public health services during displacement, aligning with the constructs of RQ3.

- Item13: "Storage and retrieval of records is dependent upon the amount and types of information technology, e.g. portable computer systems, networks, and storage systems, are available to the public health agency." All responses for this item had a

calculated mean value of 1.82. Statistical significance was present at .007 (p = .007). All respondents chose "agree" with the highest rate of frequency (70.6%), exceeding the expected outcome frequency. Other responses fell within a range of what was expected as to frequency of occurrence ("strongly agree" = 23.5% and "disagree" = 5.9%).

All LPHA respondents chose either "strongly agree" (28.6%) or "agree" (71.4%) that storage and retrieval of records was dependent upon the amount and types of IT. These responses exceeded the frequencies for expected outcomes. The majority of TNPHA respondents chose "agree" (66.7%) with "disagree" (33.3%) being the only other response selected. The only "disagree" response came from a TNPHA respondent. Statistical significance was not present for TNPHA responses (.637) and was present within LPHA responses (.005) All responses, for this item related to the use of IT for the storage and retrieval of records, aligned with RQ3 and thus supported awareness of the benefits and challenges of continuity planning within public health.

- Item 14: "My public health agency utilizes information technology for the purpose of record keeping." The mean value for this item was calculated at1.76, from all responses. Statistical significance was very strong with a p-value of .001 (p = .001). Responses from all respondents indicated that their agencies utilized IT for the purpose of record keeping. The highest frequency in occurrence for a response provided by respondents was "agree" (76.5%). The observed outcome frequency for this response ("agree") exceeded what was expected (25%). There were only two responses provided by respondents to this item of the CPPHS, the other response

being “strongly agree” (23.5%), which did not exceed the expected outcome frequency.

LPHA respondents selected either “strongly agree” (21.4%) or “agree” (78.6%). TNPHA respondents selected either “strongly agree” (33.3%) or agree (66.7%). In either case, as well as for the response of “agree” by LPHA respondents, responses exceeded the expected frequency outcome for the expected response. Statistical significance was present among responses provided by LPHA respondents and not present among responses from TNPHA respondents. Over all respondents indicated by their responses that they supported the use of IT for the storage and retrieval of records, which again aligned with RQ3 and thus supported awareness of the benefits and challenges of continuity planning within public health.

- Item 15: " My public health agency has plans and information technology, e.g. portable computers, wireless communications, and necessary equipment to conduct daily operations, based upon continuity planning, to access and maintain records during a time of crisis.” The calculated mean value for this item was 2.06 from all responses. Statistical significance did not occur as the value of p was greater than .050 ($p = .074$). While responses from all respondents who indicated “disagree” were within the expected outcome frequency (23.5%), the response of “agree” for this item exceeded the expected outcome frequency (58.8%). A lesser provided response “strongly agree”, fell within the range of the expected outcome frequency (17.6%).

LPHA respondents’ responses were varied, indicated were “strongly agree” (21.4%), “agree” (57.1%), and “disagree” (21.4%). Only the response of “agree” exceeded the frequency of expected outcome. TNPHA responses indicated “disagree”

Table 5

Kolmogorov-Smirnov (K-S) One-Sample Test Results for CPPHS Items Aligned with Research Question Two (RQ3)

Survey item (n)	K-S z	*D* value	Clarifies elements of awareness related to RQ3
11. Having accessible records			
16	1.320	.047	Yes
12. Record keeping and retrieval is a function of continuity planning			
17	1.801	.002	Yes
13. Storage and retrieval of records is dependent upon information technology (IT)			
17	1.631	.007	Yes
14. My public health agency utilizes IT for the purpose of record keeping			
17	1.936	.001	Yes
15. My public health agency has plans and IT			
17	1.238	.074	Yes

(33.3%) and "agree" (66.7). Each of these responses exceeded the expected frequency for outcome.

Statistical significance was present among LPHA responses (.021) and not present among TNPHA responses (.999). Even though there is no statistical significance present, the preponderance of responses indicates a form of agreement which would

align with the elements of RQ3. This item proved to be a barrier to some for some of the respondents, especially among members who represented LPHA. (Table 5).

Comments from respondents, see Appendix F, indicated that responses to emergencies should be prioritized and that record keeping is not a function of continuity planning. In regards to IT, comments reflected that support staff must also be considered in addition to IT for the purpose of record keeping, and that not all programs within public health are supported by IT. Finally, while some respondents indicated they had some IT capacity, especially as it pertained to communication, lack of practice of the plans provided a barrier and also lack of back-up power rendered IT capacity useless. (Appendix F for comments from CPPHS respondents).

Discussion

The extent to which public health agencies in northern Wisconsin are prepared to provide continuity planning is dependent upon several variables. These variables include: awareness, implementation, and capacity. RQ1 addressed awareness of "continuity planning" as well as its use within public health. Implementation of continuity planning was the premise for RQ2. Implementation of continuity planning in public health was highlighted through existing plans of preparedness, preparing plans of recovery to meet requirements of the HIPAA, and a special focus on an area of response especially suited for public health –flu pandemic planning. Finally, capacity of public health agencies to support continuity planning was the foundation for RQ3. Capacity can be enhanced as well as hindered through the challenges and benefits of continuity planning (Wallace and Webber, 2004; Cashen 2006). Capacity within public health is

enhanced through the use of IT. IT presented both challenges as well as benefits to member agencies of the NPHPC.

Survey items of the CPHPS were aligned with each of the three research questions that were proposed by the researcher. Within this alignment, awareness of and use of continuity planning could be assessed. The preponderance of information (i.e., respondent commentary and the level of probability (regarding level of occurrence) for each survey item responded to enabled the researcher to qualify the trends in the responses.

Under RQ1, responses of the respondents showed awareness of the term, *continuity planning* with 100% agreement. Also, all respondents indicated that continuity planning played an important role within public health. Continuity planning was extensively used in emergency preparedness planning as verified with 88.2% of respondents in agreement and 11.8% in disagreement. All respondents indicated that continuity planning could assist public health in providing a response at the time of crisis, even if displacement occurred (58.8% strongly agree and 41.2% agree). Using continuity planning to meet requirements of the HIPAA (Item 4) in regards to protecting medical records caused the greatest discord among the respondents under RQ1 with 88.2% in agreement and 11.8% in disagreement.

CPHPS items 16–20 provided information in assessing if awareness of and use of continuity planning were evident. Capacity to support continuity planning was assessed with the presence of IT within the public health agencies, use of the HIPAA, and acknowledgement of current use of continuity planning. Assessing support of continuity planning within representative public health agencies of the NPHPC indicated that 11.8%

strongly agreed that their agencies had the IT capacity to support continuity planning, 52.9% agreed, 29.4% disagreed, and 5.9% provided no response. In assessing respondents' involvement with continuity planning, responses indicated that all public health agencies were involved (23.5% of respondents selected strongly agree and 76.5% selected agree). On whether HIPAA requirements should be the basis of continuity planning within public health 29.4% of respondents selected agree, 52.9% selected disagree, 11.8% selected strongly disagree, and 5.9% provided no response. Awareness of continuity planning and that it has use in public health responses from respondents indicated that 11.8% strongly agree, 52.9% agree, 29.4% disagree, and 5.9% strongly disagree. Finally, in assessing the use of continuity planning in public health 52.9% of respondents indicated that the NPHPC should do more to promote continuity planning in public health, 29.4% selected disagree, 5.9% selected N/A, and 11.8% provided no response. The use of the HIPAA and promotion of continuity planning within the consortium were the two survey items that caused the greatest variation of responses among the respondents.

Implementation of continuity planning was reviewed under RQ2. Survey items 6-10 of the CPPHS assessed whether continuity planning had been considered by member public health agencies of the NPHPC, when drafting emergency response plans. It was been shown that response plans, especially those that address pandemic planning or plans drafted to meet the standards of the HIPAA during recovery are generally created within the principles of continuity planning (Cashen, 2006; Landesman, 2001). Responses indicated that continuity planning can assist public health in providing a response to an emergency situation, including periods of displacement, by 58.8% of

respondents which selected strongly agree and with another 41.2% selecting agree. All respondents were in agreement that record keeping was *not* the only reason for use of continuity planning. Respondents indicated that continuity planning had limitations within public health, with 64.7% of respondents selecting "agree" and 35.3% of respondents selecting disagree. A vast majority (81.3%) of respondents believed that most public health preparedness/recovery plans were based upon the principles of continuity planning. While17.6% of respondents did not have this same opinion, and another 5.9% provided no response. Preparedness plans, developed with assistance of the consortia, were viewed as containing continuity planning to support public health programs. Respondents showed strong agreement, with 17.6% strongly agreeing and 52.9% in agreement of public health consortia continuity plans; 23.5% respondents disagreed and 5.9% provided no response. All respondents supported the concept that continuity planning was well suited for use in preparedness plans dealing with flu pandemic planning. Nearly all respondents believed that their agencies were implementing continuity planning within public health programming. Continuity planning was most evident in pandemic planning for flu and plans that managed requirements of the HIPAA. Almost all respondents were confident that plans developed in conjunction with public health consortia, contract deliverables, were developed with principles of continuity planning.

Finally, RQ3 examined the capacity of public health agencies to support continuity planning. With use of continuity planning under RQ3 the researcher was trying to determine to what degree IT was used among public health agencies within the NPHPC and how challenges of record keeping, data storage and recovery,

communication, and equipment would be met if displacement occurred. Using items 11-15, respondents indicated that having accessible records was important in providing an immediate response by public health with 82.3% in agreement and 11.8% of respondents in disagreement. In this instance there were 5.9% of respondents who provided no response. A majority of respondents, 94.1% believed that record keeping and the ability to retrieve records was a function of continuity planning. Another 5.9% were in disagreement with this statement. Also 94.1% of respondents believed that the storage and retrieval of records was dependent upon IT and that various types of IT equipment should be used for response. Only 5.9% of the respondents disagreed with the use of IT for the storage and retrieval of records. The use of IT among member public health agencies of the NPHPC, for the purpose of record keeping, was endorsed among respondents with a show of 82.4% (23.5% who strongly agree) and 11.8% in disagreement. 5.9% chose N/A, as to the use of IT. Respondents showed agreement that record keeping and retrieval was a function of continuity planning (94.1% cumulative). Disagreement was at 5.9%. Most respondents agree that public health agencies are ready to meet the challenges of incorporating IT to enhance continuity planning. Some of the challenges include record keeping and retrieval, and data storage. IT can also enhance continuity planning through communication methods and having portable equipment.

While most responses would indicate that respondents understand continuity planning and have incorporated continuity planning principles, it is not known whether respondents are only assuming continuity planning is provided within response plans developed by the consortium or whether representative public health agencies have taken initiative to provide for additional methods of continuity planning to ensure essential

services through BCPs, COOPs, or COG plans. Additional plans of continuity would ensure that essential public health services are met when displacement occurs (Cashen, 2006).

Summary

The purpose of this study was to evaluate the use of continuity planning among member public health agencies of the NPHPC in Wisconsin. Survey items were listed for response, which reflected the practice and principles of continuity planning as well as some challenges inherent to its use. Both qualitative and quantitative methods of research were completed with this study. Nonparametric data analyses were performed on the data, using the one-sample K-S test. The researcher encouraged qualitative information with the use of boxes for written comments aligned with each survey item. Three research questions were posed. Each research question (RQ1, RQ2, and RQ3) sought to assess the awareness of and use of continuity planning within public health. Survey items were aligned with each research question to gain an assessment of preponderance among responses provided. Each item from the survey was designed to assess an element of continuity planning. The responses to these items would help to answer each of the research questions asked.

RQ1 assessed awareness of continuity planning among public health representatives of the NPHPC and awareness as to its purpose. The main purpose of continuity planning is to maintain essential services. Ten survey items were examined and respondents indicated that they had an awareness of continuity planning. The purpose of continuity planning was not clear to respondents, as items related to using continuity planning to support the HIPAA was rejected. Respondents also indicated that

continuity planning was not currently implemented within public health programs and that Wisconsin public health consortia should do more to train members on the topic.

RQ2 assessed implementation of continuity planning in public health, among member agencies of the NPHPC. Responses to survey items indicated that continuity planning could be implemented to serve public health, especially within plans of preparedness. Record keeping was not viewed as an important use of continuity planning and respondents also indicated that there were limitations to its use within public health.

RQ3 assessed the capacity to support continuity planning within public health. Respondents indicated strongly that having the ability to assess records and make contacts was important. Many of the respondents indicated that their public health agencies had IT to support continuity planning, this may be the reason why many of the representative public health agencies indicated that they had the capacity to support record keeping. Finally, respondents indicated that they had plans of preparedness that supported continuity planning.

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Public health staff members of the Northwoods Public Health Preparedness Consortium (NPHPC) were contacted during the study to verify plans of preparedness that had been developed with representative public health agencies. A listing of preparedness plans and response drills that have been completed as contract deliverables for the NPHPC was provided upon request by consortia staff of the NPHPC. At that time it was disclosed by consortia staff that continuity planning was considered to be a "black hole" within preparedness planning and that elements of continuity planning were absent from preparedness plan development (M. A. Texidor, personal communication, March 13, 2009). Such disclosure contradicts the findings of the *Continuity Planning in Public Health Survey* (CPPHS). The findings had indicated that members of the NPHPC, who served as respondents, not only indicated they had an awareness of continuity planning, but also indicated that response plans and plans of preparedness developed thus far, addressed continuity planning. This would appear to be a case for "not knowing what you don't know" among respondents of the CPPHS. Their responses indicated that plans of preparedness that had been developed thus far, did utilize continuity planning. This discrepancy may have arisen from confusion on the part of respondents about the definition, intent, or both as related to the meaning of continuity planning within public health. Such a discrepancy not only applies to the plans of preparedness but also to public health programming in general, especially under those occasions where

displacement may occur. Such occasions would occur when a public health agency is temporarily or, in some cases, permanently dislocated from its normal workplace or site of daily operations. Displacement can occur as a result of a natural disaster such as a tornado or flood, or man-made such as fire or intentional bombing. Presumptions made by the NPHPC respondents, as to the scope and intentions of preparedness plans and related exercises, can lead to a false sense of security an absence of a proper perception of continuity planning. If this is truly the case, a public health agency may not be prepared to respond and also not prepared to deal with the challenges of the accompanying recovery phase following a disaster. The exception to this discrepancy would be those public health agencies that have developed either a business continuity plan (BCP) or Continuity of Operations Plan (COOP) on their own initiative. It is known that at least one representative public health agency of the NPHPC has taken the initiative and developed a COOP for their agency.

The essence of continuity planning can be seen within contingency plans or plans of response (Landesman, 2001). An assessment of risk identifies the need of the response or preparedness (Siegel, 2008; Laye, 2002; Cashen, 2006). Failing to provide for continuity can result in failure or non-delivery of the response plan or plan of preparedness (Logue, 1996; Kelly et al., 2005; Klitzman & Freundenberg, 2003). Current templates for response and preparedness plans may reflect the essence of continuity planning but do not include the capacity of recovery. Understanding the scope of recovery and all it encompasses appears to be the content and knowledge base in which continuity planning principles are fully incorporated. Plans which address recovery include business continuity planning (BCP), continuity of operations planning

(COOP), and continuity of government (COG) (Wallace & Webber, 2004; Rozek & Groth, 2008; Stearns, 2008; Cashen, 2006; Lerner). Failure in not seeing the bigger picture within preparedness planning and providing for response as a means to recover and maintain essential services, may be a critical break down within public health (Glasser, 2004).

Summary of Findings

There have been very few research studies which examine the use of continuity planning within public health. A study by Cashen identified key elements of COOP by federal, state, and local governments (2006). In the study by Cashen it was shown that continuity planning as an element for providing essential services only existed in 88.2% of plans reviewed (2006). Having a means to provide for essential services is a path toward continuity planning (Cashen, 2006). CPPHS respondents, as representative public health agencies of the NPHPC indicated that they were making strides to maintain essential services in response and preparedness training. However, no previous study has measured the capacity to which public health agencies of Northern Wisconsin are ready to recover from a disaster if displacement should occur. Being able to address recovery as part of a planned response is a key recommendation of this study. Other findings from this study are as follows:

Research Question One (RQ1): Awareness of Continuity Planning and Ability to Provide Essential Services during Displacement

- Designated members of the Northwoods Consortium indicated overall they had an awareness of continuity planning and capacity to support it, even if displacement should occur. The ability to implement continuity planning is reliant upon

understanding its principles. Some of the respondents commented that they were still uncertain about the meaning of continuity planning. Defining continuity planning on the CPPHS provided a frame of reference for participants to base their responses on.

- Respondents indicated that continuity planning plays an important role in public health. The importance of continuity planning can be seen in pandemic planning and data recovery under the Health Insurance Portability and Accountability Act (HIPAA). There were comments from some of the respondents that records pertaining to the HIPAA were not used within their agencies and that HIPAA requirements should be strongly considered, but should not be the basis of continuity planning. Some of the members of the NPHPC have established BCP to meet the requirements of the HIPAA. Portage County as a member of the NPHPC, and operating as a health and human services agency was required under the HIPAA to become compliant by 2005 (personal communication, March 19, 2009). Further commentary suggested that continuity planning should not be a focus point within public health.
- Member public health agencies understand continuity planning and its implementation within public health and suggested it only is applicable to emergency preparedness planning. The function of continuity planning was unclear to some of the respondents.
- Continuity planning can assist public health in providing a response to an emergency situation, including during displacement. For some, county policy

dictates the depth of the response that can be provided, including the use of continuity planning.

- Member public health agencies of the NPHPC are involved with continuity planning, although for most, involvement is believed to come from emergency preparedness training.
- Promotion of continuity planning must be provided by the public health consortia staff of the NPHPC. It is hoped that as the topic of planning evolves there will be more discussion that addresses continuity planning. Respondents seemed confident that more discussion of continuity planning would occur within the consortium.

Research Question Two (RQ2): Continuity Planning Beyond Preparedness and Response

- Respondents indicated that continuity planning could have limitations within public health.
- Record keeping is very amenable to continuity planning within public health. Having a method to store and retrieve records is desirable. It is believed by the respondents that having accessible records is an important factor in providing an immediate and appropriate public health response.
- Planning for response to the threat of pandemic flu outbreak was deemed to be the best use of continuity planning within public health. Commentary suggested that a pandemic will occur over a long period of time and having the capacity to respond over a sustained period of time is a key element to continuity planning (Cashen, 2006).

- Response plans and plans of preparedness as developed in conjunction with public health consortia are assumed to be based upon the principles of continuity planning. It is indicated that response plans go well beyond recovery which gives an indication that recovery occurs over time. Public health consortia staff may unintentionally be providing a sense of continuity planning and its implementation within public health. Public health consortia staff must fully define continuity planning to its member agencies, as it relates to maintaining essential services during recovery from a disaster or crisis.

Research Question Three (RQ3): Benefits and Challenges of Continuity Planning in Public Health

- The majority of respondents agree that there are benefits to using continuity planning within public health.
- A large majority of respondents indicated that because of continuity planning they will be better prepared during a crisis or disaster and especially when displacement has occurred. The infrastructure of public health must be enhanced with adequate information technology (IT) that meets the needs of public health programming.
- Accessibility to public health records was important in providing an immediate and appropriate response after a disaster. It was believed by the majority of respondents that the maintenance of records was a function of continuity planning.
- Availability of information technology (IT) was viewed as a challenge by respondents. For some of the respondents IT support was limited. Barriers to

incorporating IT to ensure continuity planning during response and recovery to a disaster included lack of IT equipment, remoteness, lack of communication equipment, and non-availability of basic services such as public utilities. Other barriers included minimal practice of response plans, availability of staff to assist in response or not having enough staff to respond, and prioritizing immediate needs during an emergency. These barriers would reduce the capability to provide essential services by public health staff.

Conclusions

The following conclusions summarize the responses collected with the CPPHS:

- There is a lack of awareness by some members of the NPHPC about the implementation and practicality of continuity planning within public health. Members that have incorporated BCPs or COOPs within their agencies have a greater understanding and appreciation of a public health infrastructure built upon continuity planning. Portage County Health and Human Services is one member of the NPHPC that has completed a BCP. Although local health departments like Portage County could afford to hire a private company to compile a BCP, smaller municipalities might find it impossible to pay for such a plan. These members may have come to the realization that a response is only as strong as the recovery capacity of the provider. Agencies that are only prepared to provide a response may fall short if they are not able to recover after a disaster. Continuity planning not only incorporates response but looks at the larger picture of recovery, which is critical if essential services are to be maintained.

- Record keeping requirements of the HIPAA is a good platform from which to incorporate the principles of continuity planning. Within continuity planning the question of "what if" must be answered. What if your agency was destroyed by fire and all paper records were lost or destroyed? Does the agency have the capacity to respond if they themselves cannot recover? How will records be recovered? How will key personal be contacted? How will day-to-day business be conducted? If an agency can provide solutions to all of these questions they have implemented the principles of continuity planning.
- Pandemic planning is an arena for continuity planning within public health. Public health response during a flu pandemic must look beyond immunization clinics, isolating the ill, and tracking the outbreak of disease. Pandemic planning must also consider staff isolation and availability during quarantine and the capacity to communicate with other public health staff in order to maintain essential services. Mass clinics is a response that serves to address the immediate needs of the public; recovery will be dependent upon having a network of capable public health staff working to maintain essential services during crisis.
- Members of the NPHPC may have a false sense of security that preparedness plans and other plans of response developed through public health consortia address continuity planning. Public health consortia staff members have admitted that continuity planning has not been discussed with its members of the NPHPC. While elements of continuity planning may exist within the developed plans, they may not have the capacity to address recovery. These plans could also fail to provide the response needed during a crisis resulting from a disaster.

Recommendations

- NPHPC members need to have a discussion regarding continuity planning and preparedness planning to provide a better awareness of its use and implementation, with public health consortia staff. These discussions should include how to maintain essential public health services if displacement should occur and the capability to provide a response.
- Planned actions need to look beyond immediate response and also include the principles of continuity planning. Public health consortia staff must survey the members of the NPHPC to assess how many public health agencies have established BCPs or COOPs. These types of plans incorporate the principles of continuity planning and thus improve the capacity of the agency to provide essential public health services. The agencies that have incorporated such plans have already begun to think within the broader picture of recovery from a disaster, including the possibility of displacement. Perhaps public health consortia within Wisconsin should consider such plans as a contract deliverable within consortium contracts. Funding would need to be made available as implementation of BCPs and COOPs can become cost prohibitive to smaller public health agencies or entities.
- Member public health agencies will need to review continuity planning and incorporate its practice and principles into established plans of preparedness, especially in two key areas the maintenance of vital records (as they are governed by the standards of the HIPAA), and pandemic planning. It is unreasonable to

assume that a disaster that would disrupt essential services will never occur in the Northwoods region of Wisconsin.

- Representative agencies of the NPHPC should be surveyed by public health consortia staff as to deficiencies in IT and perhaps prescribe a basic package of IT equipment that would allow for communication and managing electronic records within the field. Such a strategy would enhance the capacity of even the smallest public health agency to provide essential services if displacement should occur.
- Plans of preparedness and response need to be practiced more frequently, by members of the NPHPC. An opportunity to rehearse these plans off-site from the public health agency must be provided to simulate displacement and thus make the agency better prepared in continuity planning.
- In the future, a more extensive study which incorporates an expansive research design, and incorporates a larger sample size of Wisconsin public consortia members must be completed. Such a study would ensure increased precision of the findings. Having opportunities for follow-up with members of the study would allow the researcher to see if there was a change over time in the development of more comprehensive plans of preparedness that would eventually incorporate the principles of continuity planning within its foundation. A more systematic approach must be taken to inventory developed plans, forms of IT equipment and the capacities of participating public health agencies to verify their ability to survive future hurricanes like Katrina or incidences like September 11, 2001. Being able to respond does not guarantee the ability to recover from a disaster without incorporating continuity planning.

- Finally, public health education, at the collegiate level, needs to prepare future public health leaders and health educators with knowledge and skills for incorporating continuity planning within plans of preparedness and public health programming. These elements should begin within academia where the foundation of public health principles and practice begins. Education must also be the drive behind an advocacy program within Wisconsin which makes the principles of continuity planning common practice for all preparedness programming provided by public health consortia. In Wisconsin, academia could serve as a grass roots approach by introducing the concepts of continuity planning to future public health leaders and health educators. Advocacy could serve as a top-down approach by educating public health consortia staff about the principles of continuity planning.

According to Logue, "Regardless of an area's level of preparedness, natural disasters should always be expected" (1996, p.1208). Glasser proposes that a public-health system is only as strong as its weakest link (2004). For members of the NPHPC, continuity planning may be its weakest link and one that if ignored can result in failure of an agency's established plans of preparedness.

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APPENDIX A

COMMON COOP ELEMENTS IDENTIFIED BY THE CASHEN STUDY (2006)

COMMON COOP ELEMENTS

COOP Element	Total	Percentage
Plans and Procedures	16	94.1%
Classification and Responses	16	94.1%
Alternate Facilities	16	94.1%
Essential Functions	15	88.2%
Interoperable Communications	15	88.2%
Tests, Training and Exercises	15	88.2%
Delegation of Authority	14	82.4%
Orders of Succession	14	82.4%
Vital Records, Databases and Systems	14	82.4%
Purpose/Objective	12	70.6%
Plan Management/Maintenance	11	64.7%
Authorities and References	10	58.8%
Staff/Dependent Care Plans	10	58.8%
Applicability and Scope	9	52.9%
Drive-Away Kits	7	41.2%
Financial Management	7	41.2%
Security Measures	7	41.2%
COG	4	23.5%
Photographs, Charts, Rosters and Maps	3	17.6%
Sensitivity	0	0.0%
ICS	0	0.0%

Cashen, K. M. (2006). *A compilation of necessary elements for a local government continuity of operations plan.* Unpublished master's thesis, Naval Postgraduate School, Montery, California.

APPENDIX B

RECOMMENDED COOP TEMPLATE (CASHEN, 2006)

RECOMMENDED COOP TEMPLATE (CASHEN, 2006)

A. PURPOSE AND OBJECTIVES

B. APPLICABILITY AND SCOPE

1. Classification of Emergencies Based on Vulnerability Assessment

2. COOP Integration with Emergency Operations Plan (EOP)

C. ESSENTIAL FUNCTIONS

Priority	Essential Services
1	
2	
3	
4	
5	
6	

D. AUTHORITIES AND REFERENCES

1. Federal

2. State

3. Local

4. COOP Source Documents

E. LEADERSHIP: COMMAND AND CONTROL

1. Continuity of Government (COG)

2. Order of Succession

Successors

3. Delegation of Authority

4. Incident Command System

F. COOP IMPLEMENTATION PLAN

1. Phase 1 – Activation and Relocation

a. Devolution

The devolution section should address how an organization will identify and conduct its essential functions in the aftermath of a worst-case scenario, one in which the leadership is incapacitated. The organization should be prepared to transfer all of their essential functions and responsibilities to personnel at a different office or location.

b. Decision Making Process, Initial Actions

c. Alternate Facility Identification

List more than one option based on the ability to sustain Mission Critical Systems.

d. Alert, Notification and Implementation Process

e. Hours of Operation

2. Phase 2 – Alternate Facility Operation

a. Mission Critical Systems

System Name	Current Location	Other Locations

b. Vital Records and Databases

Vital File, Record, or Database	Form of Record (e.g., hard copy, electronic	Pre-position at Alternative Facility	Hand Carried to Alternative Facility	Backed Up at Third Location

c. Interoperable Communications

(1) Radio

(2) Telecommunications

(3) Information Technology

d. Security

(1) Physical Facility

(2) Access Control

(3) Personnel

(4) Communication

e. Financial Management

f. Pre Positioned Resources

g. Drive Away Kits

3. Phase 3 – Reconstitution Procedures

G. PERSONNEL MANAGEMENT

1. Roster and Contact Information

2. Key Contingency Staff Responsibilities

3. Staff Augmentation, Mutual Aid

4. Transportation, Food and Lodging

5. Staff Personal Preparedness

To include a personal preparation kit for COOP activation.

6. Preparedness for Dependents of Staff

To include a family plan in case of emergency and a family emergency plan kit.

Cashen, K. M. (2006). *A compilation of necessary elements for a local government continuity of operations plan.* Unpublished master's thesis, Naval Postgraduate School, Montery, California.

APPENDIX C

NORTHWOODS PUBLIC HEALTH PREPAREDNESS CONSORTIUM (NPHPC)

KEY DOCUMENTS

NPHPC Key Documents

Plans

1. Public Health Emergency Plan (PHEP)
   -Telecommunications Plan included
   -Risk Communications Plan included
   -24/7 Plan included
2. Mass Clinic Plan
3. Pandemic Plan
4. Respiratory Protection Plan
5. Isolation and Quarantine Policy and Procedure
6. Environmental Health Protocol

Consortium Business

1. Work plan
2. Long term plan
3. Quality Improvement Framework
4. Bylaws
5. Consortium MOU
6. Deliverable guidance for consortium members

Training

1. Educational power points
2. List of training options
3. BT Competency Assessment tool
4. 2009 Competency Assessment tool
5. Quarterly newsletter for members' partner agencies

Epidemiology

1. Reportable disease packets for providers
2. Syndromic Surveillance (school and worksite absenteeism) materials
3. Reportable data on Excel file

Exercising

1. Tabletop template materials (mass clinic, sheltering, community containment, border, etc)

2. IPS Functional Exercise materials
3. Performance Measures Functional Exercise materials
4. Drill materials (Performance Measures, Volunteer Management, and ICS forms, IPS forms)

M. K. Texidor (personal communication, March 13, 2009).

APPENDIX D

LANDESMAN'S FUNCTIONAL MODEL OF PUBLIC HEALTH RESPONSE

Excerpt from *Public Health Management of Disasters* (pp. 25-31):

The functional model outlines below and on the pages following comprises six phases that correspond to the type of activities involved in preparing for and responding to disaster: planning, prevention, assessment, response, surveillance, and recovery. The model additionally delineates the responsibilities of the various disciplines of public health.

Planning

- Apply basic concepts of local public health to disaster management
- Conduct hospital disaster planning and coordinate with hospitals
- Help community develop plan with public health focus
- Develop health promotion with disease prevention protocols and motivate use through education campaign
- Conduct needs assessments and analyze hazards and vulnerability
- Work with other health professionals to write disaster plan specifically for public health and health concerns
- Train workforce on public health responsibilities
- Inventory supplies, equipment, communications, and people available for response
- Develop mutual aid agreements in advance
- Conduct facility-wide/agency-wide exercises to stress organizational mobilization, coordination, and communication

Prevention

Primary Prevention (before event)

- Immunization
- Control/prevent outbreaks
- Protect against risks identified in hazards, vulnerability, and needs assessments
- Conduct community education in first aid, personal hygiene, and injury prevention
- Protect and distribute safe food and water
- Protect or reestablish sanitation systems

Secondary Prevention (response to event)

- Detect and extricate victims
- Provide emergency medical care
- Organize services and treatment
- Conduct case identification and surveillance
- Establish infectious disease control
- Conduct short-term counseling/intervention
- Manage bystander response

Tertiary Prevention (recovery from event)

- Provide long-term counseling and mental health intervention
- Manage emergency services
- Manage injuries and clean-up behavior
- Reestablish health services
- Use record from response to update action plan

Assessment

- Identify potential outbreaks
- Identify potential medical, behavioral, social, and political effects of event
- Assess potential effect of loss of infrastructure on health and mental health
- Identify potential hazards and levels of acceptable exposure
- Determine incidence of disease and causal factors
- Understand mechanics of hazardous agents (i.e., radiation, toxins, thermal and water pollution, landmines, weapons)
- Determine vulnerability, level of risk, and requirement for rapid needs assessment
- Identify appropriate data to collect for decision making
- Summarize damage to health care infrastructure
- Establish continuous data monitoring

Response

Service

- Conduct ‘quick and dirty’ assessments on which to base initial decisions
- Administer logistics

- Organize services (casualty management and behavioral health)
- Communicate plans and needs (internal and external)
- Identify need for and provide emergency treatment, resources, and equipment
- Institute unified command and control
- Continue provision of primary care
- Coordinate with emergency management response structures

Education

- How long foods can be stored in the refrigerator or freezer after power goes off
- When the water is on or is not safe to drink
- How long water should be boiled before drinking
- Whether mass immunizations are needed
- When it is safe to reenter homes or eat foods after a toxic cloud has dissipated
- What is risk of delayed effects (i.e., cancer, birth defects) from the chemical or nuclear mishap to the average citizen and to those who are pregnant

Management

- Dispose of waste, debris, human and animal bodies, and biologic hazards
- Control disease vectors
- Monitor water sanitation, food, and shelter
- Control infection
- Control clean-up injuries (i.e., chainsaw accidents, electrocution, fire, unsafe structures)
- Coordinate delivery of mental health services
- Communicate health information and risks via media outlets
- Control disease and issue quarantines where necessary
- Provide interventions to large groups

Surveillance

- Establish syndromic information systems for disaster
- Conduct sentinel surveillance, using active or passive systems, of disease and public health conditions
- Use data to recognize acute disease states and high risk groups

Recovery

- Determine present level and extent of patient care capability
- Interpret data to influence deployment of resources
- Work with community agencies to mitigate long-term impact on public health
- Conduct evaluations (structured, semi-structured, and qualitative)
- Plan and direct field studies
- Manage media
- Use principles of capacity building
- Mobilize resources
- Use techniques for supplemental and therapeutic food distribution and feeding
- Organize and conduct large-scale immunization and primary health care
- Ensure maintenance of mental health program
- Establish and operate special needs shelters

Landesman, L. Y. (2001). *Public health management of disasters: The practice guide*. Washington, DC: Kirby Lithographic.

APPENDIX E

CONTINUITY PLANNING IN PUBLIC HEALTH SURVEY (CPPHS)

Continuity Planning in Public Health Survey (CPPHS)

Thank you for taking part in this study which is designed to examine the use of business continuity planning in public health programming in the northern region of Wisconsin. Business continuity planning (BCP), as defined by Wikipedia, "Is the creation and validation of a practiced logistical plan for how an organization will recover and restore partially or completely interrupted critical (urgent) functions within a predetermined time after a disaster or extended disruption".
[Retrieved February 15, 2009 from
http://en.wikipedia.org/wiki/Business_continuity_planning.]

For the purpose of this study BCP will be known as *continuity planning*.

Please review the following questions and select the response that best reflect your position and programs. This survey was developed by Gary L. Garske as a part of my thesis requirements for a Master of Public Health in Community Education degree from the University of Wisconsin-La Crosse. You will remain anonymous as a participant in this study and only summarized grouped data will be published or presented at the study's conclusion. A box is included after each question for providing additional information, comments, or feedback. The comment boxes were added in response to the pilot study and a need to provide a space for written comments. In addition, there is space at the end of the survey for overall commentary. Please respond to all twenty-one questions. Please be reminded that response to the survey signifies consent and you will remain anonymous as a participant in this study. Your participation is greatly appreciated. If you have any questions concerning the survey contact information is provided. Also included is contact information for Dr. Gary D. Gilmore MPH, Ph.D., CHES, the chair of the thesis committee for this study. All contact information is provided on page 7 of this survey.

Demographic information:

What is your primary job responsibility in public health? (Check all that apply)

☐ Health Officer ☐ Health Director ☐ Nursing Supervisor

☐ Other (please specify): ____

Number of years of service in position: _____ Years of education: _____

Gender: _____ Degrees: _____

Public health programs that my agency is providing (Please check all that applies):

__ Public health preparedness/BT	__ Environmental health	__ Laboratory
__ Tobacco	__ Accident prevention	__ Dental programs
__ School health	__ Maternal child health	__ WIC
__ Reproductive health	__ Community health	__ Immunization

__ Communicable disease
__ Tribal health issues
__ Home visitation
__ Other (please specify):

After reading the statement, please circle the appropriate numbered response which summarizes your feelings about that statement.

01. I understand the meaning of the term *continuity planning*.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

02. Continuity planning plays an important role place in public health.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

03. Continuity planning can be used to meet the Health Insurance Portability and Accountability Act (HIPAA) requirements in protecting medical records.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

04. Continuity planning can be used extensively in emergency preparedness planning.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

05. Continuity planning can assist public health in providing a response to an emergency situation, even during periods of displacement.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

06. Record keeping is the only reason to use continuity planning.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

07. Continuity planning has limitations within public health.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

08. Most public health preparedness/recovery plans are based upon continuity planning.

1	2	3	4	5

Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

09. Public health consortia use continuity planning in public health programs.

1 Strongly Agree	2 Agree	3 Disagree	4 Strongly Disagree	5 N/A

Comment:

10. Flu pandemic is a public health arena well suited for continuity planning.

1 Strongly Agree	2 Agree	3 Disagree	4 Strongly Disagree	5 N/A

Comment:

11. Having accessible records is important in providing an immediate response by public health, during times of crisis.

1 Strongly Agree	2 Agree	3 Disagree	4 Strongly Disagree	5 N/A

Comment:

12. Record keeping and retrieval is a function of continuity planning.

1 Strongly	2 Agree	3 Disagree	4 Strongly	5 N/A

Agree Disagree

Comment:

13. Storage and retrieval of records is dependent upon the amount and types of information technology, e.g. portable computer systems, networks, and storage systems, are available to the public health agency.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

14. My public health agency utilizes information technology for the purpose of record keeping.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

15. My public health agency has plans and information technology, e.g. portable computers, wireless communications, and necessary equipment to conduct daily operations, based upon continuity planning, to access and maintain records during a time of crisis.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

16. My public health agency has the technological capacity to support capacity planning.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

17. My public health agency is involved with continuity planning.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

18. HIPAA requirements should be the basis of continuity planning in public health.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

19. I fully understand continuity planning and its implementations within public health.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

20. My consortium should do more to promote continuity planning in public health.

1	2	3	4	5
Strongly Agree	Agree	Disagree	Strongly Disagree	N/A

Comment:

21. Please use the space below for any additional questions or overall commentary that you may have about continuity planning.

_____
_____
_____
_____
_____
_____

Thank you for participation in this survey which examines the use of continuity planning in public health. You will remain anonymous as a participant in this study and only summarized grouped data will be published or presented at the study's conclusion. **Please use the enclosed self-addressed stamped envelope to return the survey no later than March 12, 2009.**

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APPENDIX F
COMMENTS PROVIDED AS FEEDBACK BY THE RESPONDENTS OF THE CPHPS

CPPHS Respondent Feedback

Although the comment boxes on the CPPHS were not overly utilized, some respondents chose to record some of their comments concerning continuity planning. Following is a listing of their comments which is not in any particular ranking or order. The statement number for which the comment is addressed to is provided. Comments included:

- S1 – "Only after the Wikipedia definition you provided on page 1";
- S1 - "I don't think we use the term that frequently at the local level. I have limited knowledge on the issue, but understand the definition";
- S3- "I'm not sure [HIPAA]";
- S3 – "unsure";
- S3 – "Don't deal with medical records";
- S8 – "Response plans go well past recovery";
- S8 – "unsure";
- S9 – "I don't think it is a focus area [continuity planning in public health]";
- S9 - "What type of consortia?";
- S9 – "Consortia may assist local agencies with planning. Services are delivered by local health departments";
- S9 – "unsure";
- S10 – "A pandemic will continue over time":
- S11 - "May not need for immediate response as there may be more pressing and necessary issues";

- S12 – “I’m not sure it is a ‘function’ of continuity planning – it is an area that needs to be addressed”;
- S13 – “Also on the number of staff to assist”;
- S14 – “Not all programs are in IT systems, however”;
- S15 – “Plans in place, but not practiced regularly – Few communication items/equipment exclusively for us”;
- S15 - “No emergency power available [regarding IT]”;
- S16 - “No one on staff is truly the ‘tech’ person. Also our county has no hired IT person – need to call for service, assistance, and pay hourly rates”;
- S16 – “unsure”;
- S17 – “But its minimal [involvement with continuity planning] – basically only in emergency preparedness”;
- S17 – “As it applies [involvement with continuity planning] to emergency preparedness”;
- S18 – “I’m not sure it is the ‘basis’, HIPAA is certainly a consideration”;
- S18 – “HIPAA requirements should not be the basis of continuity planning but strongly considered when planning”;
- S19 – “Does anyone fully understand [continuity planning] at this point? Planning has evolved more thought and discussion occurs”;
- S20 – “We have excellent Consortium leadership and I’m sure we will get to this [continuity planning] in more detail”;
- S20 – “County policy dictates our ability to the depth we can plan for continuity of public health”;

- S20 – “unsure”;
- Additional comment – “I have been in public health for seven years – only one year as a Health Officer so I don’t have a full grasp on continuity planning”;
- “Difficult survey to fill out, because of lack of knowledge in the terminology”.

The researcher believes that many of these comments reflect a lack of comprehension when it comes to defining the term “continuity planning” within public health practice.