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Bioterrorism: Exploring Factors for Improving Nurse Preparedness, Policies, and Practices

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Walden University

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Leone O Tom-James

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Walden University
2020

Abstract

Bioterrorism: Exploring Factors for Improving Nurse Preparedness, Policies, and
Practices

by

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M.S., Capella University, 2013

M.S., Imo State University, 1998

B.S., University of Port-Harcourt, 1996

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy and Administration

Walden University

May 2020

Abstract

Ebola virus release/attack in New Jersey could go unnoticed but have immediate and long-lasting effects on the broader population and security. The risk underscores the need to prepare and enhance the state's efforts to deal with a release and treat the confirmed cases. This descriptive single case research explored factors for improving nurses' preparedness, policies, and practices for a bioterrorism release/attack. The epidemiological triangle conceptual framework was used descriptively in exploring, and developing a knowledge base of Ebola virus pathogenicity, characteristics, routes of transmission, and infection. The unit of analysis was Summit Ridge Genesis Healthcare Center. The theory of robust transformation provided structure for this study. Data were collected from studies on bioterrorism, U.S. government bioterrorism policies, and the interview site's bioterrorism protocol, including nurse interviews and participant observation. A pattern matching technique was used for analyzing data. The healthcare facility has the capacity and human resources to prepare and deal with the public health challenges posed by Ebola. Recommendations based on the study results include that the site train nurses of biological agents preparedness and to conduct table-top and functional exercises. The instructive social change implicit in this study has significant implications for New Jersey policymakers, the facility leadership, and nurses in preparing for a possible Ebola terrorism attack.

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Dedication

I dedicate this study to the ever-loving memory of my Parents Mr. Ambrose Chukwunyere Ihekoronye & Mrs. Cyrina Ihekoronye Tom-James.

Acknowledgments

I thank the almighty God for making this academic journey worthy and exceptional. I thank my wife- Christabel, our children-Leone (Jr), Destiny, and Eden for their dedication, patience, and support. To my elder brother Barr. Anthony N. Tom-James, I have looked up to you and will continue to replicate your style in all I do. To my elder sister Justina, you have been and remains the pillar of our extended family. To my elder brother George, who is many things to all, to my classy cousin Gabriel who loves me. I thank Chief. Clifford and Lolo. Chioma Achonye. Special thanks to Mr. and Mrs. L Ohiri. Also, I Tsega Asefaha for all her help.

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Chapter 1: Introduction to the Study

Introduction

There are studies in the United States examining state government preparedness for a bioterrorism attack (e.g. Garfield, 2005; Grundmann, 2014; Leavitt & Beacham, 2002; Murphy, 2004; Rickles & Catarious, 2015; Ziskin & Harris, 2007). Studies (Garza, 2012; Gursky & Bice, 2013; Ross, Crowe, & Tyndall; 2015; The College of Physicians of Philadelphia, 2015) which apprised how to prepare, and the federal agencies preparing for biological agent release. But it seems minuscule research has been done to inform state-level public health agencies and other relevant entities.

There is little data indicating that states in the United States have the capacities to deal with an outbreak of Ebola virus disease (EBOV) released by man or nature; underscoring a need in refining the public health emergency readiness structures transversely throughout the United States (Carafano, Florance, & Kaniewski, 2014). EBOV release by humans, accidentally or while perpetrating terror, can result in losses (Dudley & McFee, 2005; Hamburg, 2001). Its successes will be gauged by the panic and disruption it instills in a polity, how much it overwhelms a community, and challenge of the poise, citizen's repose in the states.

Similarly, the spread from the point of origin to other parts of the world of a biological agent (BA), such as severe respiratory syndrome (SARS) in Southeast Asia in 2003, Middle East respiratory syndrome (MERS) (Singh & Kuhn, 2019) in 2012, and the 2014 EBOV crisis in West Africa, verified the swiftness by which infectious diseases (ID) cause global health emergency (Chalk, 2014). These spread of Bas, which caused a

global health crisis, reinvigorated the need for State of New Jersey to comprehend the continuing threats and plan proactively. Also, they provided the stimuli for State of New Jersey to prepare in confronting, dealing, and defeating the BA threats.

New Jersey has an obligation in maintaining public health, welfare, and providing safety for the people (Institute of Medicine (US) Committee on Assuring the Health of the Public in the 21st Century, 2002). It does devolve administrative responsibilities to local jurisdictional authorizes such as counties, municipal, and borough governments (McCreight, 2015). An EBOV bioterrorism attack in New Jersey would have instant and enduring effects on the economy, physical, and psychological effects on the exposed population (Anderson & Bokor, 2012), underscoring the need to prepare.

Understanding how to prepare for the public health challenges posed by EBOV can enhance the State of New Jersey efforts to deal with its release, and in treating the confirmed cases (Klitzman, 2015). New Jersey was impacted by domestic anthrax terrorist attacks. During the anthrax terrorist state and local government officials did not instantly envision the scope of organizing needed among responders or have the required preparations in place to put the qualified plans into action quickly. Martin (2004) informed that the 2001 domestic anthrax terrorist attacks provoked thoughts on whether states had legal powers and stockpile medicines to respond to imminent attacks.

Similarly, during the anthrax terrorist attacks in 2001, the nurses faced unique challenges, demonstrating the need for a study on a populace exposed to a biological weapon (Miro & Kaufman, 2005). Correspondingly, New Jersey qualifies for bioterrorism study because a quarter of the total number of fatalities in the September

11th, 2001, World Trade Center attack were residents (Ziskin & Harris, 2007). Likewise, in 2014, nurses in the state experienced EBOV scare (Wagner, 2015).

Problem Statement

Before the 2014 EBOV epidemic in West Africa, incidents of its transmission to other countries in the world were rare occurrences in part because of the remote rural communities in Central Africa where previous outbreaks occurred. But due to the epidemic of EBOV in Sierra Leone, Guinea, Liberia, and its exportation into Nigeria and to the United States of America through air travel from Liberia, there are concerns for EBOV spreading internationally (Cohen, Brown, & Alvarado-Ramy et al, 2016). Underscoring the concerns were for example, a male visitor from Liberia was confirmed and died of Ebola virus disease while in the U.S. Also, in 2015, two U.S humanitarian aid workers who worked in EBOV-impacted-states in West Africa were infected and airlifted back into the U.S homeland.

Classified a Category “A” pathogen by the United States National Institute of Allergy and Infectious Diseases (NIAD; 2016), EBOV derived its name in 1976 from the river Congo in Zaire, now the Democratic Republic of Congo (DRC). There are five species of EBOV. The four originating from Africa are Zaire Ebolavirus (ZEBOV), Sudan Ebolavirus (SUDV), Côte d’Ivoire Bundibugyo Ebolavirus (BDBV). (Passi, Sharma, Dutta, Dudeja, & Sharma, 2015). The authors informed that the Tai Forest Ebolavirus (TAFV) is pathogenic for humans. Ghayourmanesh and Hawley (2015) and Osterholm et al. (2015) posited the Philippines Reston Ebolavirus (RESTV) is pathogenic for primates.

The 2013 EBOV epidemic erupted from hungry children residing in the Guinean village of Meliandou slaughtering and consuming Ebola virus repository fruit bats (Vogel, 2014). EBOV is spread through unprotected contact with bodily fluids of a person with symptoms or deceased; incubation period ranges from 2 days to 3 weeks (Kadanali & Karagoz, 2015). The Center for Disease Control and Infection (CDC; 2014) contends EBOV symptoms include severe hemorrhagic fever, diarrhea, headache, vomiting, and muscle pain, and so forth.

There are clinical trials for several EBOV vaccines, but none are yet licensed to protect against EBOV for humans (WHO, 2015). A study (Rogstad & Tunbridge, 2015; WHO, 2016) showed that female patients recovering from EBOV retained traces of EBOV in the vagina and rectum. Also, men retain EBOV traces in semen, lasting more than 90 days; intensifying the risks of EBOV transmission, through sexual intercourse. Rickles and Catarious (2015) asserted that the CDC directives for donning Personal Protective Equipment (PPE), and the related bioterrorism exercises are insufficient. The authors posited the nurses all over the U.S. healthcare sector contend that there is inadequate training concerning the use of PPE, including different strategies for treating and managing index patients. The same study recommended that plan such as restrictions and isolation of suspected patients do not exceed the specifications of the CDC.

Statistically, of the 15,216 laboratories that confirmed human cases of EBOV in the areas of Liberia, Sierra Leone, Guinea, Nigeria, the rate of death was nearly 75%. (CDC, 2014; Leroy, Gonzalez, & Baize, 2011; Ying, Yu, & Jie, 2014). An appraisal by the WHO determined that the untimely response to the 2013 Ebola epidemic cost the

United States more than 5 billion dollars and the worldwide financial cost was over 15 billion (Gostin & Friedman, 2015; Ross, Crowe, & Tyndall, 2015). EBOV is not only expensive to contain, but it has a potential use as biological terrorism (Gera, Gupta, Verma, Singh, & Gupta, 2017). Jansen, Breeveld, Stijnis, and Grobusch, (2014) postulated that sickening a small number of people in a community with EBOV may be enough to achieve the aim of a perpetrator.

Garza (2012), Gursky, and Bice (2013), and the College of Physicians of Philadelphia, (2015) have researched and informed on the federal agencies preparing for biological agent release in the United States, but it seems very little research has been done to notify state-level agencies and other relevant entities. Without adequate preparation, an EBOV release may have instant and enduring effects on New Jersey economy, and physical impacts on the exposed population (Anderson & Bokor, 2012). Efforts to improve understandings of how to prepare for the public health challenges posed by Ebola virus can enhance the efforts to deal with its release, and in treating the confirmed cases, impelled the need to conduct this social science research (Klitzman, 2015; WHO, 2015)

There are frontline acute healthcare facility (FAHF) for quarantining and treating the human victims exposed to EBOV in some states like Nebraska, Montana, and Maryland; Following the EBOV scare in 2014, the Texas developed a “strategy for preparing for and responding to high consequence infectious diseases posing a threat to people and communities” (Drumgole, 2016, p. 2). Others have developed training, and capacity building for the nurses, and are issuing personal protective equipment (PPE) like

helmets and protective clothing (Rickles & Catarious, 2015) that may minimize human “exposure to contaminated blood or bodily fluids” of EBOV patients (Isakov, Jamison, Miles, & Ribner, 2014, para. 2). It is important to isolate and quarantine an infected person. Most importantly, a healthcare professional should follow appropriate measures recommended by the CDC when providing care.

To date, New Jersey does not have FAHF. Richter and Santiago (2006) pointed out that New Jersey nurses not only lack bioterrorism training, but the state assumes nurses and hospitals are fully functional and can be refocused during a crisis and used in different cases/directions. This same research pointed to New Jersey's deteriorating and structurally weak nurse workforce system. The lack of a FAHF in the New Jersey and deteriorating trends among nurses are impediments not only to public health but also to bioterrorism preparedness. Similarly, there does not appear to be any research which explored how a lack of FAHF in New Jersey might enhance the State's readiness. This is a gap in the literature this research is filled.

Purpose of the Study

The proliferation of biological weapons prevents drug manufacturing companies from developing some all-purpose therapeutic countermeasures to bioterrorism (Institute of Medicine Forum on Emerging Infections, 2002). In the event of bioterrorism, nurses will provide care for the victims. To reduce adverse the health effects and keep fatalities from occurring (Madad, 2014), there is a need to strengthen the necessary bioterrorism knowledge needs of nurses (Aghaei & Bagheri, 2013).

The requisite knowledge is defined “as the accumulated practical skill or expertise that allows a human to do something smoothly and efficiently” (Von Hippel, 1988, p. 629). The requisite knowledge includes how nurses can detect the signs of a bioterrorism event, and wear and remove PPE. Also, requisite knowledge extends to how nurses can analyze and synthesize data, and how nurses can apply data to identify patterns of spread; including dealing with range and contain more biological outbreaks (Ipe, 2007).

The purpose of conducting this qualitative case study was to identify some of the factors for improving nurse preparedness, policies, and practices for bioterrorism events. I used scholarly resources in conjunction with face-to-face semistructured field interviews with 10 nurses working in New Jersey, selected by purposeful sampling technique in collecting data to address the research question. I audio recorded the interviews, member checked, and used NVivo to transcribe the interview transcripts.

Furthermore, I explored if nurses are performing bioterrorism simulation exercises, allocation of resources, table-top exercises, information dissemination, and center bioterrorism preparedness exercises in anticipation of a biological attack. Through my research, I identified some of the factors for improving nurse preparedness, policies, and practices for bioterrorism events.

New Jersey policymakers can use the findings of the research in the preparedness efforts for EBOV bioterrorism attack. Jansen., Breeveld, Stijnis, and Grobusch (2014) informed that infecting a small number of people in a community with EBOV may be enough in achieving terror. Consequently, If New Jersey lacks preparation, EBOV bioterrorism attack or accidental release may be the most potent and challenging to

defend. Anderson and Bokor (2012) detailed the effects of EBOV can go unnoticed but have immediate and long-lasting psychological effects on the broader population and security.

Research Question

RQ: What are some of the key factors for improving nurse preparedness, policies, and practices for bioterrorism events?

Theoretical Framework

In conducting a study, if a theory cannot provide structure, a researcher may add a conceptual framework (Hacker & Settles, 2015). There is no difference between a conceptual framework and conceptual model; researchers should not be discouraged by the terminology (Parahoo, 2006). The terms help with focusing minds, articulating a study (Green, 2014), making the study findings comprehensible, meaningful, generalizable, accessible, and useful to researchers (Polit & Tatano-Beck, 2004). A conceptual framework can be diagrammatic or descriptive (Robson, 2002) and used for its vivid illustrative representation (Rathert et al, 2012).

Conceptual Framework

The epidemiological triangle (ET) conceptual framework has three variables: external agent, susceptible host, and the environment was in use (Nganwa et al., 2010). The epistemology on which this study was based is Lengnick-Hall and Beck's (2005) theory of robust transformation (ART). ART's theorists recommended the ways and means organizations can adapt to deal with external catastrophic situations or the negative stressors they collectively encounter.

ART-espoused institutions implement original, groundbreaking, and incessantly flexible actions to develop the capacity for spur-of-the-moment unpredictability (Lengnick-Hall & Beck, 2005). The theorists directed organization focuses on the condition which induced the change to create new solutions and responses. ART's theorists recommended institutions expand and expend its organizational strategy and human and financial capital resources towards the external catastrophic situation for the future viability of the organization. Additionally, the theorists specified redirecting excess funds towards developing and expanding organizational response capabilities. The benefit of ART is that uncertainty is a temporary, episodic moment where institutions should be fast and agile in adopting new strategic processes for responding to the dilemma, achieving stability, and future viability of the establishment.

Nature of the Study

I used a descriptive single case study method for my qualitative research study. The qualitative technique is consistent with understanding the lived experiences of study participants (Yin, 2009). Understudying New Jersey yielded an understanding of the state's readiness for a biological attack. Accordingly, the central research point was a healthcare center in New Jersey.

The purpose of indulging in a descriptive case study includes obtaining an in-depth understanding of events, decisions, and periods. A case study is done on projects, policies, institutions, or other systems (Yin, 2009). For this study, I interviewed nurses regarding their readiness level because of a biological agent attack. The interviews provided insight to inform the decisions relating to FAHF, training, and equipping nurses.

The current bioterrorism readiness program's collaboration with the U.S. government (through the Strategic National Supply), the stakeholders, and emergency plans were discussed. Furthermore, books and articles were studied to support this research.

In this study, I explored how GHCC will function during a biological terrorism event. It is projected that GHCC might be a hub for treating victims in New Jersey if a natural or human biological attack occurs. The interviews were conducted with nurses within GHCC. Dudley and McFee (2005) discussed how preparedness for a biological attack is measured by how it affords the safety of lives, protection of property, and empowering proper defense against evolving transmittable viruses. Exploring GHCC's requirements and restrictions was used in determining the readiness level for nurses in responding to a biological attack.

Definitions

Agent: The micro-organism (e.g., Ebola virus) capable of causing the disease (Rohrer, Grover, & Moats, 2013).

Bioterrorism: An intentional release of a bacteria, viruses, or other germs (agents) to cause illness or death in people, animals, or plants (Pinto, 2013)

Ebola: A virulent disease agent of the family Filoviridae, genus Ebolavirus that is animal-borne; bats are the most likely reservoir (CDC, 2016).

Environment: The condition external to the host, enabling transmission (Rohrer, Grover, & Moats, 2013).

Host: The organism (human) capable of being infected by a specific agent (Rohrer, Grover, & Moats, 2013).

Pathogen: A microorganism that causes, or can create, the disease in a host (Pirofski & Casadevall, 2012).

Assumptions, Scope and Delimitations, Limitations

Assumptions

I presumed the study participants were open and honest in the responses they provided. The study participants were nurses at GHCC who protect, promote, prevent illness and injury, facilitate healing and treatment of individual citizens in the community. Additionally, I assumed the study participants at GHCC understood the purpose of the interviews, consented, and were transparent throughout the research.

Scope and Delimitations

The research focused on GHCC and nurses who have, or not had, training and experience vital to deal with a biological attack, working in the facility, and selected by purposeful sampling technique. But the study did not focus on all the other health care workers such as nursing aides, laboratory technicians, or medical doctors who may be vital and be tasked with bioterrorism preparedness activities. Question/s may arise in the choice of a unit of analyses, instead of units of analyses. Yin (2012) informed that a case study could be conducted to examine institutions or other systems. As a for-profit health care management center, with a mission to providing wide-ranging health care and sustaining vigorous, lively communities, GHCC has an essential role in bioterrorism preparedness.

Limitations

Limitations of this study included using one unit of analyses- the nurses-to discuss New Jersey's level of preparedness for a biological attack. But as Yin (2012) postulated, a case study can be done on an event, places, or an individual. Lastly, there were controlling conditions not known before and outside my control. They included gaining access to the research site, nurses, and scheduling interviews with the nurses working different shifts. Also, the manner the study participants answered a question, the time, and limited resources available to explore the study problem over time due to student loans and period of concluding a dissertation, were uncontrollable variables capable of impacting the study.

Significance

A Category "A" biological agent such as Anthrax release in New Jersey in 2001 tasked its public health organizations that provided care to affected (Ziskin & Harris, 2007). How well nurses may respond to the victims of EBOV may be contingent on the readiness capabilities at hand (Madad, 2014). This study explored factors for improving nurse's preparedness, policies, and practices for bioterrorism. The protocol in place in New Jersey includes (a) using the CDC all-hazards approach in protecting the public's health, and (b) the New Jersey governor requesting assistance from the federal government for the Strategic National Stockpile (SNS) protocol. To achieve synergy and seamless operation during a response, Ziskin and Harris (2007) asserted that the responders will rely on National Incident Management System (NIMS), and parts of National Response Plan (NRP) templates.

However, New Jersey does not have FAHF. FAHF's are the hospitals that have stockpiles of vaccines, medicines, and prophylactics. Isakov et al. (2014) explained that the nurses, who works at FAHFs use technologies to investigate, identify, and isolate victims or suspected victims in a high-level containment room with negative pressure designed to prevent or minimize human contact with infected blood or bodily fluids of EBOV patients.

FAHFs have the technology which the nurses use in monitoring and caring for patients with EBOV for up to four days (96 hours), have staff dressed in PPE, and communicate to the public health authorities. Nurses who provide care for victims lack PPE for use in caring for quarantined EBOV patients and dealing with infection control (nonpharmaceutical interventions; Rickles & Catarious, 2015). PPE includes helmets, clothing's, goggles designed to minimize human "exposure to contaminated blood or bodily fluids" of EBOV patients (Isakov et al., 2014, para. 2).

The findings of the study could guide in developing a training curriculum for nurses in the vocation for which they train and qualify. This research could further the understanding of how to address New Jersey's lack of FAHF and refocus of nurses during the 2014 EBOV scare. The findings of my qualitative research have significant implications for the New Jersey policymakers, GHCC leadership in preparing for EBOV terrorist attacks, and the nurses who would provide care to the victims.

GHCC leadership may also gain information regarding the internal challenges inhibiting it from training and preparing nurses in achieving competency in bioterrorism training. GHCC leadership could also discover information that may concern internal

difficulties the University Hospital Newark, New Jersey experienced in 2014 that prevented it from applying the CDC procedures during monitoring and handling of suspected EBOV infected patients (Chappell, 2015). My single case qualitative study may contribute to academic knowledge in biological disaster preparedness and effect social change by generating new insights that could improve bioterrorism resilience.

Summary

I used a single case qualitative study to explore factors for improving nurse preparedness policies and practices for bioterrorism in New Jersey. New Jersey policymakers may use the findings of the research in the preparedness efforts for a bioterrorism attack. The research could offer outline or become a template of readiness for other states to use, or unveil the areas needing enhancement, and a chance to redirect resources for New Jersey for better preparedness.

Chapter 2 reviewed the existing literature relating to biological terrorism preparedness. Chapter 3 focused on the study methodology used and a systematic approach to this research. Chapter 4 concentrated on the analysis of qualitative interviews and a review of papers involving the preparedness efforts for a biological release. Finally, Chapter 5 includes the summary, findings, conclusion, implications, and recommendations.

Chapter 2: Literature Review

Introduction

Literature Search Strategy

The relevant literature which consisted of qualitative and quantitative studies was obtained through a systematic review of the Thoreau: Multiple database search tool. Various databases that I search included Journal of Bioterrorism & Biodefense, Homeland Security, Military and Government Collection, books and articles on bioterrorism preparedness were employed. The search keywords included *bioterrorism*, *terrorism*, *biological agents*, *State preparedness*, *bioterrorism preparedness*, and *responses*. The study used a narrative structure technique in reviewing the relevant body of literature retrieved from multiple sources. Mays, Pope, and Popay (2005) stated that narrative synthesis method involves detecting and collating the core recurring or pertinent themes from perused literature.

Theoretical Foundation

Desire, not philosophy leads a researcher to a topic of study. However, a philosophy must undergird the research because it will not only bind views to the field of education, it will deliver edifice, and distillate the researcher scrutiny of the problem (Hacker & Settles, 2015). The theoretical foundation of this study was Lengnick-Hall and Beck's (2005) (ART). The theorists suggested ways and means organizations can adapt to deal with external catastrophic situations or the negative stressors they collectively encounter.

According to Lengnick-Hall and Beck (2005), when organizations become inundated with uncertainty, the ill-prepared tend to establish and apply stratagems to deal with the situation. The ideal ought to be before the incident occurs, the organization, identifying and recognizing what core organizational process they would need (Ipe, 2007). ART theorists espoused that instead of the institution establishing and applying stratagems to deal with the situation, they should implement inventive, groundbreaking, incessantly variable actions and develop the capacity for spur-of-the-moment variableness (Lengnick-Hall & Beck, 2005).

ART -directed that organizations focus on the condition which induced the change and create new solutions and responses (Lengnick-Hall & Beck, 2005). ART recommended that the institution expand and expend its organizational strategic human and financial capital resources towards the external catastrophic situation for the future viability of the organization (Lengnick-Hall & Beck, 2005). Additionally, ART specified redirecting excess funds towards developing and expanding organizational response capabilities. The benefit of ART is that uncertainty is a transient moment where institutions should be fast and agile in adopting new strategic processes for responding to the dilemma, achieving stability, and future viability of the establishment.

Conceptual Framework

Robson (2002) stated that a conceptual framework could be diagrammatic or descriptive. Rathert et al. (2012) informed that a conceptual framework might be used for its vivid illustrative representation. EBOV is zoonotic, that is, transmissible from animal to human or, existing in animals, can kill people (Feldmann, 2014). EBOV spread from

animals (bat or monkey) to a person galvanizes a process of events called pathogenesis- “entry, primary replication, spread to target organs, and the establishment of infection in the target organs” (Burroughs, Knobler, Lederberg, & Institute of Medicine, 2002, p.1).

There are only four hospitals in the United States (located in Nebraska, Georgia, Montana, and Maryland) with specialization and infrastructure (biocontainment units) for dealing with emerging infectious diseases (Kutscher, Robeznieks, & Rubenfire, 2014).

Mate et al.’s (2015) research, found that EBOV is noticeable in the blood of victim during severe ailment but may continue for a lengthier period because the person can tolerate it without showing signs of infection. The same study found EBOV in the breast milk of a sufferer more than 2 weeks after the inception of the ailment. Category “A” biological agent EBOV causing viral hemorrhagic fever has an extreme possibility for levying adversative public health impact with enormous casualties. Studies (e.g. CDC, 2014; Kamata et al. 2014) posited EBOV cautionary signs include dizziness, weakness, vomiting, muscle pain. Smith and Hewison’s (2012) study showed that EBOV victims have higher blood urea nitrogen.

Other indicators of EBOV transmission include higher aspartate aminotransferase in victim’s blood, creatinine, sore throat dizziness, including weakness, and conjunctivitis (Kamata et al, 2014; Schieffelin et al., 2014). A study by Fowler et al. (2014) showed that EBOV victims who receive care through the oral dispensation of intravenous fluids and antibiotics may survive. However, EBOV sufferers who receive care in FAHF have a higher chance of surviving because of the intravenous fluid pump machine modules which enable hydration, circulatory volume, and controlling blood pressure. Scott, Sesay,

Massaquoi, Idriss, Sahr, & Semple, 2016) stated that a survivor of EBOV faces haphophobia challenges- ranging from recurring headaches, muscle, and joint pains. Some may suffer abdominal and chest pains, pictographic and range ailments, insomnia, exhaustion, and downheartedness.

There is a vaccine comprising several antibodies (EBO7) in use for treating ZEBOV and SEBOV (Pratt et al, 2010). Another unlicensed vaccine produced by Merck, rVSV-ZEBOV, that may provide temporary protection during outbreaks has not received approval by the U.S. Food and Drug Administration (FAO) or from the WHO (Henao-Restrepo et al, 2015). The authors informed that the durability of rVSV-ZEBOV is unknown; for instance, if administered to the nurse, there is no knowledge of how long nurses would be safe.

EBOV has a high possibility for a large-scale dispersion, which could produce strident mass public fear and civil disruption of living. Zapanta and Ghorab (2014) stated that some signs of a biological weapon (such as EBOV) attack include victims in the same locations possessing the same symptoms and that when tests are conducted, they yield similar results. As such, the authors posited that to deal with the effects necessitates a broad-based public health infrastructure preparedness consisting of enhancing surveillance, training of public health workers, laboratory diagnosis, and stockpiling of Ebola virus antiviral medications.

As a tool with potential for fulfilling a terror group's destiny toward reaching some long-range goal, Category "A" Ebola virus terrorist attack may not require a massive amount of planning and resources. It may not necessitate for the virus to be

transformed in any way to achieve success because it spreads from person to person.

Maron (2015) posited that the Ebola virus could be a weapon by inserting small quantities into a cannister bomb; the explosion would release the virus, possibly infecting people.

The nurses must be trained on bioterrorism and bioweapons preparedness for use in handling of bioterrorism sufferers. But it is challenging that they lack the bioterrorism readiness drill needed for appropriate analysis and managing fatalities (Zapanta & Ghorab, 2014). The vastly transmittable and mortal nature of EBOV accentuates the importance of developing a thorough and reliable preparedness and response protocol for dealing with its release in New Jersey. Preparation to deal with EBOV vulnerabilities is indispensable. I used a qualitative approach to identify factors for improving nurse preparedness policies and practices. Through my results, I discerned that Jersey is prepared for EBOV attack.

Overview of Bioterrorism

The act of bioterrorism includes using a bacteria, toxin, or virus from a living organism as a weapon by either government, asymmetric groups, and individuals to cause death in people and animals (CDC, 2016, Fong & Alibek, 2010; Zapanta & Ghorab, 2014). Human error can increase the chances of releasing biological agents. For example, in 2015, the U.S. Army inadvertently shipped-off Category “A” potent live Anthrax spores to multiple locations (US DoD, 2015).

Human lives were not lost (US DoD, 2015). To deal with the outcomes of inadvertently shipping potent live Anthrax spores to multiple occasions, the U.S

Department of Defense (DoD) to set up a committee headed by the Army's Surgeon General (CBRNE, 2016). The committee found that lapses in bureaucracy and personal accountability contributed to this event (US DoD, 2015).

The committee recommended the establishment of a standing DoD biological safety review panel to track and monitor all requests and transfers and to review and validate procedures for working with biological select agents and toxins (US DoD, 2015). The panel recommended appointing a DoD executive agent who would be responsible for reviewing and harmonizing the processes for transferring biological agents from where they are stored (US DoD, 2015). Also, a method to screen and confirm all requests for natural products from outside the DoD was introduced.

Zapanta and Ghorab (2014) informed that for a biological weapon to be active, it should be highly transmissible, be infectious in minute quantities, and have a short gestation period. The authors apprised that preferably, it should elude known methods of recognition; Aerosolizing remains the most efficient technique for dispersing a bioweapon. Also, they posited that, if released in a crowded space, aerosolized biological weapons disband beyond the primary area, leading to increased infections. To achieve biosecurity around humans, animals, and the environment, and dealing with the intractable issues posed by weapons of mass destruction, currently 176 nations, are signatories to the Biological and Toxin Weapons Convention (BTWC) (Bielecka & Mohammadi, 2014). However, a challenge is that terrorist's groups (ISIS, Khorasan, Al-Qaida, Boko Haram) are not cosigners to the BTWC. Add summary and synthesis to fully conclude the section.

Some Cases of Bioterrorism

Drawing inspiration from ideology, religion, politics, or ecology (Zapanta & Ghorab, 2014), the aims of committing bioterrorism may include imparting terror, create casualties, economic losses, and disruptions in a nation. The use of biological armaments on humans is not novel. Early historical cases of use of biological weapons in perpetuating fear, terror, causing death and destruction on people extended to the 14th century BCE when the Hittites sent Rams diseased with Tularemia to their Greek enemies (Barras & Greub, 2014). Emperor Barbarossa used human cadavers in poisoning water well in 12th century CE Italy (Riedel, 2004).

In the 14th century BCE, the invading Tartar military force, after suffering a plague, initiated a biological-warfare by catapulting the diseased human remains into the city of Caffa, thus, inducing a disease epidemic-black death, which ravaged North Africa, Near East, and Europe (Frischknecht, 2003; Madad, 2014). In the 15th century CE, Riedel (2004) states that the Spanish Conquistadors led by Pizarro presented the South American natives with variola-contaminated clothing; in the 17th century, the Polish Army levied bio-warfare by firing saliva from rabid dogs towards their enemies.

There are cases of contemporary bioterrorism in the United States. During the French Indian War in the 18th century, the British colonial army decimated the Native American Indian tribes along the Ohio River Valley with smallpox-laden blankets (Chaliand & Blin, 2007, Levy & Sidel, 2012; Prakash, Sharada & Pradeep, 2010; Riedel, 2004). In 1984, the Rajneeshee religious cult willfully poisoned salad bars with

Salmonella in a Dalles Taco Time salsa bar in Oregon, which sickened almost 800 humans.

Human lives were not wasted; 48 people were hospitalized (Carus, 2005). In the 1990s, the terrorist group Al Qaeda explored the use of biological agents (National Commission on Terrorist Attacks Upon the United States, 2004). In 2001, Urbano (2006) postulated that a U.S scientist Bruce E. Ivins was presumed of levying domestic anthrax terrorist attacks in the U.S, which caused five deaths and infected over 17 individuals.

Continuing, natural incidences of the Severe Respiratory Syndrome (SARS) in Southeast Asia, in 2003; the Middle East Respiratory Syndrome (MERS) in the Middle East., 2012, and the Ebola Virus Disease (EBOV) crisis in West Africa, in 2014, validated the speed by which Infectious Diseases (ID) spreads from the point of origin to other parts of the world. It corroborated how swift ID's, induce global health emergency (Chalk, 2014). It confirmed that nations are susceptible to evolving infectious diseases (Ziskin & Harris). It compelled governments to evaluate their bioterrorism protocols (Smith & Hewison, 2012). It bolstered the need for states in the U.S to understand the continuing threats posed by ID's and BA's and proactively prepare in confronting, dealing, and defeating the threats.

Act of terrorism such as the U.S World Trade Towers (WTC) in 1993, on September 11th, 2001 (WTC), and unsuccessfully in 2009 (Christmas day failed Improvised Explosives Device (IED) bombing of a U.S airliner) by Al-Qaeda terrorist group strategy were designed to inflict harm on American economy and culture (Huntington, 2007). Al Qaeda's overarching goal include inciting global Jihad,

establishing a Pan-Islamic Caliphate by working with Islamic extremist affiliates. Al Qaeda aims to topple infidel regimes and expelling nominal Muslims, Westerners, and non-Muslims from Muslim countries (Fradkin, Haqqani, & Brown, 2005). Al Qaeda's goals gained stimuli through regional networks that are operating autonomously (Global Security.Org, 2015). Al-Qaeda splinter groups such as Khorasan, Al-Shabab, Islamic State in Iraq and Syria (ISIS), and fundamentalist persons with the intents and goals of terror attacks having a psychological impact and physical damage to the terrorized (Stewart, 2014) are threats to the U.S homeland.

An Overview of Terrorism: Terrorist Mentality

There may not be a commonly pleasant characterization of what terrorism is or who is a terrorist, whose view and effectiveness of what may constitute acts of terrorism both as a tactic and strategy to effect change, or to a non-terrorist whose perception of the exploitation of terrorism and policy to make a change. To different asymmetric groups like ISIS, Boko-Haram, Al Qaeda or Lashkar et Taiba (LeT), and domestic fundamentalist, including Boko-haram, who lack armaments or military capabilities to engage in open conflict with the U.S. exploiting of acts of terrorism may be a ploy and tactic to effect change.

In expounding terrorism, Meisels (2008, pp. 341-342), stated, that "terrorism is a subset of politically motivated violence which falls short of conventional war and is internationally illegal and (to say the least) morally questionable." This definition seems to agree that terrorism must be politically driven. Also, the definition dismissed acts such as infecting computer networks with malware or attacking the power grid, as mere acts of

sabotage because infecting computer systems with malware or attacking the power grid do not strictly involve the practical actions of killing human beings.

Finding a regularly accepted definition of terrorism may be challenging; the same might not be relevant with regards to terrorist mentality. A terrorist mindset (mind) may be abounding with motivations, procedures, and activities intended to deliver a message to the victims-individuals, institutions, and governments. Terrorists in typology do not share or have the same pedigree. Some examples are Osama bin-Laden (Saudi), Timothy McVeigh (American), and Hafiz Muhammed Sayeed (Pakistani).

The terrorists who participate in deadly terrorist attacks should not be adjudicated to be mentally unstable, insane or mad for the very fact that inclusion of individuals with mental deficiencies or capabilities may task terrorist intentions, outcomes, and skills with security risks-just as with developing Human Intelligence (HUMINT) sources by organizations and governments, accepting and developing suicide bombers or suicidal attackers by terrorist groups appears to comprise careful selection, meticulous vetting, training, nurturing, and preparing individuals for dangerous assignments. In the end, may not be the end in, and of them, because a suicide bomber is firstly human, and humans have capabilities to shy away from decisions.

Terrorism as a stratagem is also a tool exploited by terrorists in attaining a resolution with regards to the views of the terrorized. To a terrorist may be a means to an end because of the willingness to die in the process of committing terrorism, thus, fulfilling the terror group's destiny toward reaching some long-range goal (Maghan,1995). Most terrorists illuminate the perception of guardians and not invaders;

some (ISIS, Boko Haram) have elevated practices that are the excesses of warfare, to routine practice.

Terrorist conventional methods include beheading, immolating, and crucifying, including drowning the so-called infidels (Christians, animists, atheists, nominal Muslims, and noncombatants) not as an unintended side effect, but as collateral damage (Richardson & Hays, 2006). The willingness to die in the process of terrorism underscores that exterminations, perversity bombings, and assassinations, are all in a day's work (Richardson & Hays, 2006), which a terrorist must never balk. Hence, a terrorist would not discriminate between soldiers and civilians- all are fair game.

Most terror groups (ISIS, Al-Qaida, LeT, The Kurdistan Peoples Party (PKK), Fattah, and Hamas) seem to exude political- siege mentality and objectives which include replacing dread for actual soldierly valor (Clauset, Heger, Maxwell, & Gleditsch, 2010). To aforesaid terrorist groups, terrorism remains a choice of tactic, of strategic standing to stake claims, and similarly, send explicit messages regarding; Land; Expansion; Self-determination; and Rights of existence. The Fattah, terrorist attacks in Berlin-Germany in 1972 and Chechen rebel's terrorist attacks in Beslan- Russia, appears to be where terrorism, as a tactic or strategy, was exploited to address perceived social and political injustice from the Israeli's and Russia to the Palestinians and Chechens. The expectations were: Violence or the threats of ferocity would be useful in re-directing public opinion, and indeed, usher in the much-needed change.

Psychological Effects, Public Fear and Anxiety Surrounding the Threat of Terrorism

Most terrorist groups (PKK, LeT, Al-Qaida, Boko-Haram, and Hamas) have full grasps of ontological view of reality with regards to the psychological effects, public fear and anxiety surrounding terrorist attacks. An example remains the Munich Olympic Games massacre in Germany in 1972, France attacks in 2015, and continuing Boko-Haram attacks in Nigeria since 2008. Boko-Haram and ISIS employ terrorist attacks in spotlighting their groups on the world stage, and in the living rooms of persons in the world through Television broadcasting. Successive terrorist attacks- the September 11th, 2001 terrorist attacks against the U.S by Al-Qaeda, the Mumbai attacks in India in 2008 by LeT, and ISIS, made a bigger splash because of carnage levied on specific groups of people and significant heritage institutions.

The cases of the September 11th, 2001 terrorist attacks upon the U.S. by Al-Qaeda, the Mumbai attacks in 2008, and Norwegian attacks of 2011 were terrorism events, which seized and held international attention. For capturing and retaining international attention remain one of the objectives of terrorist groups. For example, the speed and pervasiveness of media coverage deployed by the media in covering the Mumbai-India attacks in 2008, Norwegian attacks of 2011, and Paris-France attacks in 2015, Nice-Paris attacks in 2016 were not only spectacular but were also much magnified. In the case of the Mumbai attacks, most people all over the world watched with elation or distaste, time-line broadcasts of the pointless and vulnerable butchery of civilians made up of women and children.

How public fear and anxiety ties into terrorist actions may also not be an assumption of terrorism, but equally a terrorist mentality and an intended impact or effect of terrorist attacks. As Jenkins (2008) stated, it is progressively a real tactical weapon; terrorists are vicious when they kill, but additionally dangerous when they think. Such fear, assumptions, mindset, or effect were evident in the 11th March 2004 train bombing in Madrid, Spain attacks. The 11th March 2004 train bombing in Madrid-Spain implicitly illustrated the concept of shared pathology of control by governments and terrorists. For example, the 11th March 2004 train bombing in Madrid-Spain subsequently not only rehabilitated the Spanish people's perception of terrorism, but it also changed the trajectory of elections in Spain, forced the government of Jose Maria Aznar to fall, and improving the public policy of continuing billeting Spanish military contingent in Afghanistan. Nosal (2014) postulated, the new Prime Minister. Zapatero introduced measures within the intelligence agencies and Police aimed at curbing the excesses of Islamic fundamentalists.

Terrorism Recruiting

Whitlock (2007) found that the traits terrorists look for in recruiting people to join terrorist networks range from people without criminal records, to individuals with borderline personalities. The same study (Whitlock, 2007) showed terror groups personages who can be affected by charismatic clerics, or beings, who manipulate emotionally needy women into committing criminal acts. Reasons include sustaining psychological edge, and the upper hand by doing things that are shocking to the enemy.

Accordingly, children and women are never off-limits. In cases of lethal attacks, people who may be amenable to bounded ethicality - failure to see a bigger picture (such as legal consequences), and gullible might equally be traits that terrorists look for in recruiting people to join terrorist networks. For instance, to a radicalized, an understanding of the word and action suicide may be disparaging and too simplistic, because of being schooled to understand death as martyrdom or self-sacrifice to Allah and reward in heaven of several virgins.

Bounded ethicality comes into play by entreating *Allah* (God) during deadly attacks in the form of Jihad, -a conflation of the concept of Jihad. In the real sense, Jihad means self-defense: from Satan, temptation and from the unjust (meaning those who war against the Muslims, which radical Islamic theology has miscomprehended to say a holy war against other religions and infidels (Ali, 2006). Social conditions (living space, self-determination, and rights of existence) have been goading individuals to consort with suicidal terrorist groups (the Palestinian Liberation Organization (PLO) Lashkar et-Taiba (LeT), Tamil Tigers (LTTE), and the Kurdistan Workers Party (PKK). The latter has been known not to hide under the semblance of religion in carrying out suicide attacks. To the PLO, LeT, LTTE, Boko-Haram, and PKK loss of life is a tool employed in advancing the courses of lifestyle, self-determination, and in achieving Islamic Statehood.

Other qualities terrorists look for in recruiting people to join terrorist networks includes those in confinement in detentions and prisons. Others are those who are susceptible while using the internet to agree to proposals made by terrorist recruiters, and

most individuals who reside in regions plagued with corruption like Nigeria, Pakistan, and Colombia. Others are those who dwell in areas beleaguered with internecine wars like West and Central and Eastern Africa. In battle, plagued places mentioned, and especially in prisons, orientation and collaboration that has taken place between organized crime and terrorism include conversions from Christianity to Islam, schooling inmates to overlap from traditional boundaries or areas of operations such as organized crimes to full-blown terrorism.

Public Traits and Terrorism Calculus

Political developments and lack of opportunities for social improvement, compel ethnic groups to resort to terrorism. Some examples of ethnic groups include the “*Umkhonto we Sizwe*,” the military wing of African National Congress (ANC) in former apartheid South- Africa (Cooper et al, 1989-90), PKK, and *Sean Fein* the armed wing of the Irish Republican Army (IRA) in Northern Ireland. Counter-terrorism measures such as mounting checkpoints, screening machines, and the addition of personnel can pressure terrorist or terrorist groups to transmute, -resorting to other terrorism measures of kidnapping and suicide bombing.

Some illustrations include Israel where Palestinian terrorists employ suicidal attacks and bombing both as weapons of terrorism aimed at weakening the tenacity of Israeli occupying forces, thus, substituting terror for physical military capacity (Clauzet et al, 2010). In Iraq and Syria, the Kurdistan People Party (PKK) and Al-Qaeda in Iraq (AQI), Afghanistan (Taliban, and Haqqani terror networks), and mostly Palestinian Authority Territory (PAT), where there are competing groups (Fatah, Al-Aqsa Martyrs

Brigade, and Hamas) among terrorist groups for terror supremacy and support from locals, appear to inspire terrorist attacks.

Biological Weapons Program

After World War 1, the U.S conducted its first review of biological weapons; an additional revision was carried out in 1941. In 1942, in response to the Japanese biological warfare threat, the U.S employed its program to develop biological weapons in 1943. By the 1960s, the U.S. recognized that the expansion of biological weapons was viable and that their usage on the battlefield could be real. However, the resolve of the U.S. BA program in its formative years was for deterrence and to even the score, should the prevention of its use, be futile.

Ongoing, the U.S. had an active belligerent biological program pending it's unilateral renouncing in 1969 and 1970. In 1975, the U.S endorsed the BTWC. Regardless of the BTWC, asymmetric threats are prevalent that is compelling the U.S. in maintaining a protocol for medical defense against biological warfare agents (Thompson, 2018). For example, Russia is a signatory to the BTWC, has amassed large quantities of biological agents such as smallpox virus and other disease agents in its bioweapons program. Others include Iran, North Korea, China, and Syria. (Martin et al, 2007). However, the U.S. biological warfare protocol is disjointed and controlled by different agencies. Fry-Pierce and Lenze Jr (2011) harped on the importance of preparing for a biological agent attack, indicating the need for States in the U.S to have a disaster preparedness and response protocol.

Status of U.S Hospital Preparedness for Biological Agent release

The U.S policy for health and medical systems-emergency preparedness and response protocol, comprising National Disaster Medical System (NDMS) and the Metropolitan Medical Response System (MMRS), outlined how Healthcare workers and medical systems can lessen injury and losses during disaster occurrences and supporting response efforts (Cooksey, 2004). For example, throughout responding to the September 11th, 2001 terrorist attacks, NDMS and MMRS were used, and have remained the dominant Healthcare protocol for use in impending terrorist attacks.

Cooksey (2004) study illustrated that NDMS and MMRS had become templates for U.S local and national disaster preparation plan and efforts. The NDMS, comprising private sector hospitals, federal agencies, and response volunteers' cooperative program, assists human victims from natural and human disasters or terrorist attacks. Its roles include supporting on-site medical response teams, providing, protecting, and conveying victims to treatment terminuses; and to sustaining unpaid infirmary for treating casualties. Under the MMRS protocol, municipalities are required to have a synchronized disaster team made up of medical facilities, first responders such as emergency medical services, fire, State public health officer, law enforcement, and the stakeholders.

More than \$800 Million was assigned by the U.S Congress to fight EBOV, including over \$5 billion earmarked in emergency supplementary capitals to boost efforts to contain the epidemic worldwide, toughen national readiness, fast-track developing serums and treating index cases (Rickles & Catarious, 2015). U.S Hospital Preparedness Program (HPP) formerly known as National Bioterrorism Hospital Preparedness (NBHP)

welded the Healthcare facilities in the U.S into partnerships; to (or “intending to”) building and enhancing bioterrorism readiness and backup response abilities. However, there is a lack of an all-inclusive instrument for determining hospital preparedness for a major disaster (such as bioterrorism induced by man or nature), (Nekoie-Moghadam et al, 2016) and most notably, a substantial lag, in reporting of the status of U.S Hospitals bioterrorism preparedness.

Zhong et al. (2014, p. 6335) quantitative cross-sectional study showed that a hospital having in place “emergency medical response capability, disaster management mechanisms, hospital infrastructural safety, and surge capacity to muster human resources” is a mean or basis for achieving resilience. By resilience, indicating the totality of a U.S hospital infrastructure and staff functioning and weathering the threat of total collapse during a major disaster such as bioterrorism induced by man or nature. Also, having the capacity to degrade gracefully when a major catastrophe such as bioterrorism is unavoidable. For specificity, the broad range of scale for such systems would include the totality of a hospital system. Bennett (2006) indicated hospitals in the U. S, are poorly equipped to manage victims of bioterrorism; signifying, hospitals continuing relying on resources at the State, and national levels to prepare.

Niska and Shimzu (2011) study which relied on the data from 2008 National Ambulatory Medical Care Survey (NHAMCS) in assessing U.S hospitals readiness for public health emergencies, found that almost all the hospitals surveyed had strategies for dealing with biological incidents and natural epidemics. Their study found that U.S hospitals readiness for volatile occurrences were infrequent in comparison with other

forms of events. Also, most surveyed hospitals considered withdrawing services (elective procedures and admissions). Some hospitals envisioned designating and equipping substitute upkeep zones such as inpatient lobbies to supplement as intensive care areas for victims.

Niska and Shimzu (2011) found that some hospitals had reviewed the distribution of motorized ventilators for treating mass casualties, while some had simulated comprehensive training, and few added mass inoculation or suppository delivery. Also, some hospitals deliberated on registering health care workers in advance. Also, some hospitals had prior agreements in place with nearby medical facilities to assign grown-ups, less had dealings with children. Also, fewer hospitals dealt with the requirements of progenies and decrepit individuals in a period of a public health emergency.

State of New Jersey Bioterrorism Preparedness Level

The thought-out use of biological weapons by a sovereign state, asymmetric groups or individuals to induce fear, intimidate and coerce, governments or societies to reach an end or ends, qualify as acts of terrorism (Clauzet., Heger., Young, & Gleditsch, 2010; Mahan & Greet, 2012). Natural outbreaks of bioterrorism occurring, are equally a reality, either as a pandemic or epidemic. Therefore, having scientific knowledge, developing a readiness and response plan for containment, maintaining clear avenues for communicating to citizens, information input, and distribution is crucial (Keller, 2013). Whether terrorism is instituted in the quest of national interests (NI) or by an individual or asymmetric group, the goal (psychology) for exploiting terror is to terrorize. To the

terrorized, the efficacy of biological terrorism and results are criminalities, to the terrorists, a sacred duty to achieve an end.

Garfield (2005) specified that the U.S. capability to prepare for and respond to the act of bioterrorism hinges principally in the 50 states' public health infrastructure. Preparedness actions involve Prevention, Detection, and Response (PDR). Prevention- regulating the environment, agriculture, controlling access to most biological and chemical agents; Detection- providing education and training to the nurse, enhancing surveilling techniques diagnosis of diseases. The response includes - developing response plans and capabilities for treating bioterrorism sufferers.

The states have a fiduciary obligation as contained in the U.S constitution to maintain public health, welfare, and provide safety for the people (Ziskin & Harris, 2007). States, in turn, can and does entrust (public health, well-being and protect the people) responsibilities to local jurisdictional authorizes such as counties, municipal and tribal governments. In turn, the U.S. government wield influences through Homeland Security funding (HSF). For example, in the specificity of mitigation and preparedness for public health emergencies, the federal government through CDC maintains cooperative agreements with the states. Upon a request from a state, the CDC does assist with expertise.

It then follows that New Jersey which the study examined in this single case study must prepare to respond, for at least three days before receiving support from the federal government (McCreight, 2015). Nurses cannot prevent bioterrorism but should prepare for public health disasters resulting from bioterrorism attacks (Ziskin & Harris, 2007).

Rebmann (2006) study, provided information on how nurses can plan to respond to bioterrorism issues, which includes participating in educational sessions that deal with bioterrorism. My study is expected to become a template for New Jersey in providing training for nurses.

In the act of bioterrorism in New Jersey concerning the use of EBOV to impose significant harm upon victims, nurses will incumbently respond (Madad, 2014). Treating the victims will depend on the solidity of Critical Infrastructures (CI) such as FAHF hospitals and transportation systems. Achieving successes will depend on the readiness of viable vaccines and drugs, and most importantly, the capacity of the public health systems to communicate with the public (The College of Physicians of Philadelphia, 2015). To discharge their fiduciary responsibilities, Garfield (2005) and Patel, Nadel, and West, (2014) discoursed, states must revamp their public health infrastructure, boost the nurse capabilities, and blend efforts across various domains of management to deal with the threat of biological terrorism.

New Jersey with the seat of government in Trenton is confined in the north by the State of New York, in the east by the Atlantic Ocean, and in the south by the State of Delaware; and on the west by the State of Pennsylvania (Nationsonline.org, 2019). Peopled initially by Native American Delaware Indians, formally called New Netherlands in the colonial times, located in the northeastern U.S, on the continent of North America, with an estimated population of 8,944,469 (U.S Census Bureau, 2016), and occupying a total area of 7,836 sqm. Miles, the State of New Jersey, has a frontier of 480.32 miles. (NJ.gov,1996-2017).

Ziskin and Harris (2007) indicated that New Jersey health all-inclusive bioterrorism protocol, laden by the lack of funds, prior, September 11, 2001, terrorist attacks was revamped due to the infusion of federal funds and federal policies. Chess and Clarke (2007) informed, through the Bioterrorism Act of 2002, states, territorial governments, and municipalities received funding through the Health Resources and Services Administration (HRSA) and the CDC. Also, cabinet-level policymaking body- New Jersey domestic security preparedness task force was formed and given the responsibility for managing Statewide actions about local preparedness for a terrorist attack. New Jersey state Police Office of Emergency Management (OEM), was elevated.

Chess and Clarke (2007) claimed that in 2005, the State of New Jersey founded an Office of Homeland Security and Preparedness (HSP) to develop disaster preparedness plans and actions. New Jersey directed funding to deal with deficiencies in emergency preparedness, including acquiring 800 MHz radios for communication enhancement. New Jersey allotted towards sanitizing equipment exposed to radiation and toxins.

Continuing, Ziskin and Harris (2007) enlightened, that New Jersey state Governor, and the Legislature, has public health powers and responsibilities in dealing with bioterrorism and naturally occurring infectious diseases. Also, the state Governor and local representative have constitutional powers in declaring public health emergencies, as charted in the Model State Emergency Health Powers Act (MSEHPA). Currently, the New Jersey Department of Health and Human Services (NJDHSS) underwrote a 40-hour certificate course for nurses covering the areas of preparation and

public health law. Other areas include incident command protocol, chemical, and biological agents.

According to Chess and Clarke (2007), the CDC unified its nationwide automated disease surveillance system with New Jersey infectious disease reporting system. To conduct preparedness programs for public health professionals, the CDC began funding hospitals such as Hackensack University Medical Center, University Hospital, Newark New Jersey, and Robert Wood Johnson Hospital. The aforesaid hospitals were designated as Centers for public health preparedness. For example, Hackensack Meridian Health. (2018) informed, Hackensack University hospital is National Incident Management System (NIMS) compliant and a front-runner in Healthcare Emergency planning and response.

On its own, GHCC nurses are not trained in Incident Command Emergency Operations Plans and Decontamination (ICEO &PD) as well as on continuous emergency preparedness exercises and drills. GHCC has not developed a three-tiered disaster preparedness exercises. These include table-top exercise, where the staff is exposed to emergency simulation exercises; a Functional Exercise (FE) meant at assessing and appraising designated emergencies and the responsibilities of various departments in a pretend emergency environment. Also, there is not a full-scale exercise (FSE) model emergency response plan aimed at integrating the U.S. military, local, federal, and regional entities.

Bioterrorism Studies

During the Cold War, the Soviets strived to nurture Ebola virus. As a military armament because of constancy in spray and potential to causing significant death in humans, the U.S military has had an awareness of Ebola virus strains since the late 1970s, holds exclusive rights on their alterations, experiment, dealings, and replication (Agold-Rich, 2014). The Japanese cult, Aum Shinrikyo, with a purpose to retrieve samples of Ebola virus for later use in terror, sent followers to assist the government of the Democratic Republic of the Congo in 1992 Ebola outbreak (Aquino, 2016).

A study (Cenciarelli et al., 2015) described a biological attack scenario. Another study (Aquino, 2016) described circumstances by which the Ebola virus can quickly disperse into unsuspecting populaces by nurses. Günther et al. (2011) espoused this possibility was substantiated in 2009 by a virologist working in BSL-4 infecting herself with a needle tainted with Zaire Ebolavirus (ZEBOV) and concealed traces of blood.

Aquino (2016) study on public health aid workers discoursed a willful spread of Ebola virus by a fundamentalist/s nurses returning overseas from service from Ebola virus-infested nation, constituted substantive national security and public health danger. Aquino surmised that after auto-inoculating and becoming overwhelmed, a person (nurse), would have 2 to 21 days before becoming indicative. With the U.S not having compulsory isolation policy in place for nurses without alleged Ebola contact, choosing a mass-transit transportation system, the bioterrorist could then set out on an assignment to circulate the virus. For example, should a synchronized squad of fundamentalist persons be to exploit the Ebola virus, the consequence could be more overwhelming.

The use of biological weapons may afford terrorists an economical method to perpetrate terrorism in the U.S (Spoons, 2012). Furmanski (2014) study provided a well-known appraisal of contagious pathogens releases in upscale, well-financed, and state-managed research Centers in the world. Biologicals attacks accomplished on U.S. soil include the Rajneeshees salmonella attacks, 1984; alleged Bruce Irvin`s domestic anthrax terrorist attacks in 2001. Craft, Lee, and Rowlinson (2014) discoursed that a bioterrorism occurrence will probably lead to sheltering victims at numerous health care facilities. Furthermore, its impacts on logistics and human resource are expected to be unadorned and more commanding than during the 2001 domestic anthrax terrorist attacks.

Although the U.S Legislators and researchers need be apprehensive of the likelihood that scientists can abuse pandemic pathogens research, the exponents (Lipsitch and Inglesby, 2014) called for continuing research on contagion pathogens because it is essential to recognize its progression and machinery of the development of diseases and spread. Continuing, they argued that this information might assist the public health agencies, serum producers, and administrations in preparing for budding spates. Also, Lipsitch and Bloom (2012) study, recommended clear risk-benefit appraisals and improving biosafety practices before releasing funding for work on such pathogens.

Klotz and Sylvester (2014) quantitative simple probabilistic risk assessment study, estimated that the prospect of a virus discharging from a lab and causing a pandemic might be as high as 1-30%. Harmon (2011) work, showcased nearly 400 incidents of dubious pathogens and biotoxins occurrences in U.S bio-safety laboratories over seven years period. It underscored the position of dissenters/cynics (Klotz and

Sylvester, 2014) who called for its restriction because of unintended release due to deficient biosafety. Their study underscores the possibility of contagion occurring.

McCreight (2015) study showed how failures to develop and sustain a contingency plan due to reliance on federal government assistance could induce a cataclysmic upheaval. McCreight findings supported the assertion that making “plans to prevent, respond to, and rapidly recover from public health threats is critical for protecting and securing public health” (CDC, 2011, p. 1). Nurses can prepare to respond to bioterrorism issues by participating in educational sessions that deal with bioterrorism (Rebmann, 2006). More (2011) single case qualitative doctoral study found that the communities who lack preparation may suffer chaos and an increase in casualties during a biological attack.

Literature Relating to Methodology

Inglesby and Relman (2015) study, outlined the condition terror group’s or individual may choose to start a pandemic involving a potent live biological agent in a polity. Craft, Lee, and Rowlinson (2014) expressed that another goal of terrorists is to additionally showcase to their noncombatant targets that their government cannot defend them. Madad (2014) research found that asymmetric groups are interested in exploiting biological agents and elevating the threat of bioterrorism to the fore. Another study (Zapanta & Ghorab, 2014) confirmed aerosolizing, remain the most practical method of releasing biological agents in society.

Although operating beneath law enforcement radar, hampers their capacity to deploy large-scale biological attack, terrorist’s feat of terror should not be verified by the

bulk of mortalities, but by the substance of social disturbance and fear they wrought. For example, a disease-ridden person discharging a quantity of EBOV in an airplane destined to the U.S or surreptitiously releasing EBOV in water or food (Jansen et al, 2014) may terrorize the populace. It becomes analytic that New Jersey, proximal to the State of New York should prepare.

Planning for Bioterrorism

The U.S recognizes the challenges posed by biological agents, especially, the availability of the technologies to convert biological agents into weapons. Also, the U.S government understands that asymmetric groups can weaponize biological agents and has initiated efforts to upgrade its public health and emergency response capabilities for response to acts of biological terrorism. Dudley and McFee (2005) averred that improved readiness increases the safety of lives and protects property during natural disasters and human terrorism attacks. Also, improved preparation empowers proper defense against evolving transmittable viruses.

Dudley and McFee (2005) study, showcased U.S readiness efforts against bioterrorism. Also, Price-Anderson Amendments to Atomic Energy Act of 1954; Verification Protocol for Biological and Toxin Weapons Convention (1975) and Top Officials (TOPOFF) Program (2000) dealt on U.S bioterrorism preparedness. Other readiness protocols include: Public Health Security and Bioterrorism Preparedness and Response Act of 2002; Strategic National Stockpile (2003). A current bioterrorism preparation practice includes: Project BioShield (2004); Project BioShield II Act of 2005

(S 975); Homeland Security Grant Enhancement Act of 2005 (S 21); and the Amendments to the Public Health Service Act (including S 265, S 969, HR 1570).

A U.S national policy readiness effort against bioterrorism with direct state application include strengthening the SNS, which stores vaccines, antibiotics, prophylactics, and other medical response materials. SNS is managed by the Department of Health and Human Services (HHS) and the Department of Homeland Security (DHS) (Grundmann, 2014). In the event of a biological terrorist attack or other public health emergencies, a state governor, requests and within 12 hours, receives assistance from the federal government for the Strategic National Stockpile (SNS) protocol. States, in turn, have strategies for distributing the SNS supplies. Also, newly manufactured medicines and serums manufactured under Project BioShield-2004 are placed in the SNS (Gottron, 2010).

A biological release in the U.S will provide an impetus to spot the exceptional value nurses bring to these conditions (Madad, 2014). Gostin and Friedman (2015) asserted that zoonosis from wildlife is the central public health threat facing humankind worldwide. The scholars endorsed reserving funds for searching and detecting different zoonotic pathogens from wildlife.

Since the 2001 domestic anthrax terrorist attacks in the U.S, and continuing, Sell and Watson (2013) informed, for 14 fiscal years, (2001-2014) the U.S dedicated \$78.83 billion on biodefense funding. The expenses in biodefense led to understanding the peril of bioterrorism and in developing new biological agent detection technologies. To deter

biological agent release, in 1983, the CDC specified conducting work on Category “A” agent EBOV in maximum containment facility BSL-4 (Cole, 2012).

There are many BSL-4 facilities operational in the U.S. Features of BSL-4 maximum containment facility includes restricted access, negative pressure room inhibiting air outflow, and PPE for operatives. Working in BSL-4 laboratories necessitate extra precautions such as entree to infinite air-locked places and positive pressure outerwear with an isolated air source.

The importance of table-top exercises on bioterrorism preparedness cannot be overemphasized because, if appropriately planned, can yield hands-on experiences. Abraham et al. (2012) advised that table-top exercises remain an avenue to produce real discussions that engender cooperative problem resolution between residents during emergencies. Malet and Korbitz (2015) discourse on the importance of interactive exercises in bioterrorism preparedness, exposed local and state government officials in charge of public health emergency management who may be unskilled with best practices established from significant incidents. Regarding bioterrorism preparedness and response, the authors opined that data be rendered to the agencies working on public health, for use in responding to a biological agent event.

Weicker (2013) upheld reauthorizing Pandemic and All-Hazards Preparedness Act (PAHPA) of 2006. Their study showed that PAHPA could aid in addressing the breaches (inability to providing care to a multitude of persons, lack of vaccines, medicines, and prophylactics) in the public health system in dealing with a bioterrorist attack and fortify its labor force. Also, PAHPA may perhaps, encourage the U.S public

health agencies in updating, merging its surveillance protocol, and health information technology systems.

Armstrong (2012) disclosed that state governments play essential roles in the lives of residents. Moreover, reorganizing state health structures around bio-preparedness, provides residents a way of living during times of crises. Also, state preparedness for mass fatality incidents (MFIs) resulting from the biological agent such as Ebola virus utility in terrorist attacks can be estimated by its (state) organizational capabilities; operational capabilities; and resource-sharing capabilities (Gershon et al, 2014).

In realism, nurses, doctors, and public health officials employed in Healthcare facilities are the first responders to biological attacks. Among the three professions, Smith and Hewison (2012) contended that nurses are keen to respond to a bioterrorist attack but lack the preparedness to do so. Nurses readiness for a bioterrorist incident remains a worry because they might be the first to attend to victims and diagnose an issue (Ippolito et al, 2006). To perform nurses should be cognizant with the hospital policies and personal protection regimes. Foremost, nurses should have the required medical skills to be operative (Considine & Mitchell, 2009; Patel, Nadel, & West, 2014).

Akins et al. (2005) qualitative study informed that nurses play essential roles in response to bioterrorism by conducting disease surveillance, determining a probable cause of exposure (Mondy, Cardenas, & Avila, 2003), and informing officials of their observations. West, Patel, and Nadel (2014) posited that during, and after a bioterrorism event, nurses are in the vanguard in caring for victims, by receiving victims into the hospital, triaging, taking vital signs, and serving as the primary link with families. Also,

throughout a bioterrorism victim's stay, nurses provide long-term care. Training and developing nurses have substantial benefits for the stakeholders, local communities, and businesses that employ nurses.

U.S Healthcare institutions are obligated to introduce bioterrorism tutoring for nurses and intensify bioterrorism awareness. Smith and Hewison (2012) found that the issues impeding nurses' readiness for a biological terrorist attack include perspicacity of what constitutes bioterrorism. For example, there is divergence regarding the acuity of a bioterrorist attack as realism, and nurses expecting real bioterrorism incidence was occurring in the nurse's domains.

Smith and Hewison (2012) further asserted the role of formal knowledge, gained through schooling and experience of the biological agent utilized in the terrorist attack, underscore nurse's receptiveness in rejoining in bioterrorism attacks. Grimes and Mendias (2010) explanation reinforced by Young and Persell (2004) study, enlightened that there is a connection between the nurse's purpose to respond to biological terrorism incident and information of the biological agent used. It signifies that nurse's knowledge of typology of bioterrorism is some stimuli to the response.

Additionally, a concern inhibiting nurse's willingness to participate in bioterrorism readiness include the role of institutional plans and policies and personal factor. Nurses are not only unacquainted with hospital bioterrorism program; they suspect the procedures do not protect nurses. To this end, I inferred that the instructions nurses receive in contamination control should extend to bioterrorism exercises. To advance readiness, nurses should undertake proper bioterrorism attack preparation.

Bioterrorism Training for Nurses

An assumption in New Jersey is that nurses, and hospitals, are fully functional and can be refocused during a crisis and used in different cases/directions (Akins et al, 2005; Richter & Santiago, 2006). Without training and preparedness, no expectations should be made regarding the readiness of nurses during a bioterrorism attack (Grimes & Mendias, 2010). The U.S government requires health care institutions to develop, introduce, and increase nurse bioterrorism preparedness education (Jones, 2002).

In 2009, the International Council of Nurses (ICoN) advocated the inclusion of bioterrorism response training as part of an undergraduate curriculum for budding nurses and for practicing nursing professionals as part of continuing education. While a nursing curriculum remains the blueprint for a nursing career, courses for a Licensed Practice Nurse (LPN), Registered Nurse, (RN), and Bachelor of Science (BSN) vary by school. The nursing curriculum in most institutions does not cover hospital bioterrorism training, leaving nurses un-prepared in discharging their professional role.

Smith and Hewison (2012) narrative mixed-methods study, disclosed that the Nursing Emergency Preparedness Education Coalition (NEPEC) (2003) required nurses to be knowledgeable in four vital academic areas: assessment, critical thinking, communication, and technical skills. Cameron and Rainer (2003); Considine and Mitchell (2009) recommended that by acquiring and developing Knowledge on skills and schooled on the principles of disease and infection control, nurses can train, prepare and respond to bioterrorism occurrences.

Nyamathi et al. (2010); Rose and Larrimore (2002) studies, recommended using computers in simulating bioterrorism situations. The studies endorsed including bioterrorism study as part of a continuing education class. Their research showed that developing bioterrorism response preparedness consists of a mixture of experience, educational training that is grounded in leveraging lectures, and practical. Also, that nurse training factor is a required and essential asset for a hospital functioning during and after a biological release or bioterrorism attack.

Training and Preparing Nurses for Ebola Bioterrorism

With the increase in the possibility of extremists, terrorists, and criminals using biological agents in bioterrorism; including biological agents unintended release on U.S soil, there is a need for nurses to prepare. Ebola virus (Agent) is transmitted from the host (animal to human and from a human to human); do not necessitate production on a massive scale or weaponization. Grundmann (2014) study disclosed that nurses could prepare and respond to bioterrorism by initially conducting risk assessment involving monitoring and surveillance, risk management comprising preparedness, prevention and decontamination, and risk communication consisting U.S public health response and management policy.

Risk Assessment Modelling

According to Grundmann (2014) during risk assessment modeling, nurses should consider: (1) that unintended release can occur. (2) Nurses should reflect that extremists/terrorists, and criminals are aware of the potentials, and destructive capabilities of Ebola virus, (3) have access to Ebola virus and intention using Ebola virus

in furthering jihad or by extremist, for personal expression of dissatisfaction against the U.S homeland; and an action which may or may not require an organizational leadership.

(4) Nurses should contemplate that extremists/terrorists and criminals can release Ebola virus in the U.S through a human or animal. Also, nurses should reflect and plan for a response to Ebola virus release on U.S soil involving quarantining and caring for victims in their health care facility.

Monitoring

Monitoring of biological agent threat is complex and challenging; their symptoms can be the same or unspecified. Some signs can be immediate; some may take time (days and weeks) in manifesting, hence, causing a delay in their early diagnosis (Pappas, Panagopoulou, & Akritidis, 2009). During monitoring modeling, nurses should consider ways of informing the public to take proper measures and avoid a public panic. Nurse risk-management model must cover the actors (terrorists, governments, individuals) method of release, the likelihoods associated with Ebola virus, the area where a release can occur, and the type of readiness and treatment (accessibility to hospital, serum, treatment plan, impact on the economy, and fatality) for the population (Grundmann, 2014). The totality of risks is then linked with the expenses for monitoring and investigation.

Surveillance

During risk surveillance modeling, Tyshenko (2007) advised that surveillance modeling be done using the epidemiological investigation process (EIB). EIB process involves looking at the rate of disease occurrence, spread, and death of victims in each

population; including the forms and likelihoods of disease occurring. Also, Grundmann (2014) suggested that surveillance modeling include the response time and how long it takes for the disease (Ebola virus) to incubate in victims before its known symptoms become apparent. These are necessary for reducing the likely spread of released Ebola virus and increasing the survival rate victims.

Risk Management Modelling

How to prepare for and managing a biological agent release or bioterrorism attack is challenging because of synchronizing and managing the resources from the municipal, state, and federal government it will require. However, with the direction of the CDC and the Health Resources and Services Administration (HRSA), Raber, Hibbard, and Greenwalt (2011) recommended training nurses to identify the signs of a biological agent release and its exposure to victims, may limit its spread among the population at risk. Preparedness modeling should extend to looking at access to the hospital, isolating the victims, requesting and receiving aid from the strategic stockpiles within 24 hours, and treating the victims. Also, preparedness modeling should extend to how a state using its communication tools in reaching the public in the languages people understand, and how a state governor, making a public health emergency declaration may affect the process.

If there is an unintentional release of EBOV or EBOV bioterrorism attack, before an epidemic is recognized, nurses may be susceptible to acquiring and spreading infection, thus potentially increasing early outbreaks. Previous events involving EBOV release, showed that illness and death can be reduced if there is a reputable procedure that enables quarantining and treating victims. It intensified a need for a state to have a

frontline acute Healthcare facility, educating and training nurses to prepare. Training nurses in biological disaster preparedness and response are essential in identifying a natural agent release or bioterrorism attack. Training may aid nurses in abating or averting initial Ebola virus outbreak.

The U.S Public Health and Security and Bioterrorism Preparedness and Response Act (PH&SBP) of 2002 authorized the CDC to provide funding to states for Public Health Emergency Preparedness and Response (PHEPR). States have various PHEPR curriculum, while some have formed partnerships. For example, the States of New Jersey Hackensack University hospital School of Public Health, and New York-University at Albany, School of Public Health, and Columbia University: Mailman School of Public Health are partners in strengthening the professional competence of the public health workforce.

Coltart, Johnson, and Whitty (2015) study using data from Ebola epidemics in reconstructing infection, transmission, and spread, showed administering a prophylactic vaccination to nurses embarking on humanitarian missions abroad, may reduce or prevent nurses from contacting, spreading EBOV, and causing epidemics. This study exemplifies that the predominant reactive strategy of treating nurses' after infection may not be a way to prevent EBOV epidemics. Also, it is imperative to conducting threat analyses at nursing institutions and in Healthcare facilities for nurses to identify the damaging factors of biological agents (Rim & Lim, 2014). Hence, nurse bioterrorism education should cover how to protect themselves by selecting, donning, and removing proper PPE when caring for and treating victims of Ebola virus disease (Goodwin & Corley, 2015).

Summary and Conclusions

Incidents of exporting Ebola virus disease sickness from West Africa to the U.S by infected Healthcare workers and through air travel by a visitor from Liberia intensified the concerns for EBOV spreading internationally. With an appraisal by the WHO of its untimely response at almost six billion US dollars; and worldwide financial cost over 15 billion dollars. By the characteristics, EBOV has a high latent for use as biological terrorism.

Ebola virus disease is transmissible from animals (Bat and monkey) to human through unprotected contact with bodily fluids of a person with symptoms or deceased; gestation time ranges from 2 to 21 days. Ebola virus cautionary signs include severe hemorrhagic fever, diarrhea, headache, vomiting, higher points of blood urea nitrogen, and muscle pain. Other indicators of EBOV transmission include higher points of blood urea nitrogen, aspartate aminotransferase, and creatinine, sore throat dizziness, weakness, and conjunctivitis. Ebola virus has been found in the breast milk of female victims. Also, female patients recovering from EBOV retain traces of EBOV in the vagina, rectum. Male patients retain Ebola virus in their semen, lasting more than 90 days; intensifying the risks of EBOV transmission, through sexual intercourse.

As a tool with potential for fulfilling a terrorist group's destiny toward reaching some long-range goal, Ebola virus terrorist attack may not require a massive amount of planning and resources. It would not necessitate for the virus to be transformed in any way to achieve success because of spreading from person to person. Ebola virus can be weaponized by inserting small quantities into a bomb; the explosion would spring the

virus possibly infecting people. The vastly transmittable and mortal nature of EBOV accentuates the importance of developing a thorough and reliable preparedness and response protocol for dealing with its release in the State of New Jersey.

It is essential for a person living with the Ebola virus to receive care. Treatment includes the oral dispensation of intravenous fluids and antibiotics. However, EBOV sufferers who receive care in FAHF have a higher chance of surviving because of machine enabling hydration and controlling their blood pressure. A survivor of EBOV faces challenges ranging from recurring headaches, muscle, and joint pains. Some may suffer abdominal and chest pains, pictorial and range ailments, sleeplessness, tiredness, and downheartedness.

It is possible to lessen the consequences of bioterrorism through apt and operative readiness, and by spotlighting the exceptional value, nurses bring to these conditions. But the knowledge and skill need of nurses- patient assessment, diagnosis, and personal protection regimes, and clinical skills to be operative have not been part of their specialists' training. Nurses are not only unacquainted with hospital bioterrorism program; they suspect the plans do not protect nurses. Therefore, it is imperative that nurses be cognizant with hospital policies and personal protection regimes. Foremost, nurses should have the required medical skills to be operative.

If a biological agent release or bioterrorism attack occurred, New Jersey would likely mobilize nurses. Nurses response will be predicated by their willingness to answer the call to duty engage instead of abstaining and remaining with their families. Treating the victims will depend on the solidity of CI, such as FAHF hospitals and transportation

systems. Achieving successes will depend on the readiness of viable vaccines and drugs, and most importantly, the capacity of the public health systems to communicate with the public.

To aid in discharging their fiduciary responsibilities, New Jersey must revamp the public health infrastructure, boost nurse`s capabilities, and blend efforts across various domains of management to deal with the threat of biological terrorism. Also, training nurses in biological disaster preparedness and response are essential in identifying a biological agent release or bioterrorism attack. Training may aid nurses in initiating suitable treatment and containment of the release.

Chapter 3: Research Method

Introduction

This research was conducted to explore factors for improving nurse preparedness, policies, and practices for bioterrorism events in a state in the United States. Summit Ridge Genesis Healthcare Center in West Orange was used as the study site to explore some of the key factors. The study literature review was completed in Chapter 2, explaining the necessity of readiness regarding the biological attack in general and particularly for a Category “A,” Ebola virus which is transmissible from animals (Bat and monkey) to human through unprotected contact with bodily fluids of a person with symptoms or deceased.

My study literature review found there are studies in the U.S examining state government preparedness for a bioterrorism attack. Also, there are other studies which appraised how to prepare and the federal agencies which are preparing for biological agent release. But it seems minuscule research has been done to inform state-level public health agencies and other casualties; underscoring a need, in refining the public health emergency readiness structures transversely throughout the United States.

Research Design

Biological outbreaks occurring is a reality, whether becoming a pandemic or epidemic, having scientific knowledge, developing a preparedness and response plan for containment, maintaining clear avenues for communicating to citizens, information input, and distribution is crucial (Keller, 2013). Having qualified biological disaster plans on hand provides hospital management personnel a sense of security and reassurance

because they may not be skilled in managing the disaster or partake in a real emergency management process (Klein et al, 2005). Also, there is a need for biological disaster occurrence advocates to have the capacity to respond to the risk and avert damage or needless forfeiture of life (McFee et al, 2004). Realizing this ability involves converting the central government plan into state agendas.

Thus, the study examined the research question:

RQ: What are some of the key factors for improving nurse preparedness, policies, and practices for bioterrorism events?

This research answered this principal research question through a descriptive case study on the New Jersey Summit Ridge Genesis Healthcare Center. This exploration provided an opportunity for the study participants to answer questions on the factors for improving nurse preparedness, policies, and practices for bioterrorism events. Also, the study participants talked about bioterrorism preparedness exercise programs conducted by the U.S. government (see Klein et al, 2005), and the avenues for reaching and interacting with the stakeholders during bioterrorism events. It is pertinent that this gap in research relating a state government bioterrorism readiness be addressed. This study addressed this critical social concern.

Lengnick-Hall and Beck (2005) suggested the ways and means organizations can adapt to deal with external catastrophic situations or the negative stressors they collectively encounter. According to the authors, when organizations become inundated with uncertainty, the ill-prepared tend to establish and apply stratagems to deal with the situation instantly. The authors espoused instead of the institution establishing and

applying stratagems to deal with the situation, should, implement inventive, groundbreaking, incessantly variable actions and develop the capacity for spur-of-the-moment variability.

Lengnick-Hall and Beck's (2005) theory of ART directed the institution to focus on the condition which induced the change, create new solutions and responses, and expand and expend its organizational strategy and human and financial capital resources towards the external catastrophic situation for the future viability of the organization. Additionally, ART specified redirecting excess funds towards developing and expanding organizational response capabilities. The benefit of ART is that uncertainty is a transient, episodic moment where institutions should be fast and agile in adopting new strategies for responding to the dilemma, achieve stability, and future viability of the establishment.

This theory guided the study in conducting face to face semistructured "fluid conversation" (Yin, 2009, p. 109) of 10 nurses at GHCC to explore factors for improving nurses' preparedness, policies, and practices for bioterrorism events. The face to face semistructured interviews, which lasted over 4 weeks, supported in exploring the healthcare facility bioterrorism readiness efforts. I also gathered information from written articles and books. I examined New Jersey's plans, procedures, and resources in organizational capabilities. Also, I studied the healthcare center's operational capabilities and resource-sharing capability.

Ethical Protection of Study Participants

As a participant-observer, before conducting interviews, I sought and was granted approval from Walden University's Institutional Review Board (IRB). (Walden IRB# 09-

24-18-0458648). Preceding the meetings and data collection process, I presented an overview of the study and consent forms to each study participant to sign. I informed the study participants that their participation was voluntary, and should the study pose potential harm or risk, they had the option to withdraw or continue.

Selection of Study Participants

Research study participants are habitually doubtful or hesitant of a researcher's motivations and may primarily be cautious of establishing contact and communications (Nappo, Iafrate, and Sanchez, 2013). However, entering a group through an intermediary who has a link to a community may confer greater legitimacy to a researcher's study in the views of participants (Hammersley & Atkinson, 2007). I leveraged O'Sullivan, Russel, and Berner (2008) direction in initiating contact with the study participants through an intermediary. Hence, I contacted the facility administrator via a telephone and was invited to appear in person to discuss the purpose and significance of the interviews.

Research Participants

Because it was not feasible to interview the whole population, sampling a select few who possessed the attributes of the community was appropriate. The sample of 10 nurses was accurate because a sampling size does not have to constitute a certain percentage of the population (Vasileiou, Barnett, Thorpe, & Young, 2018). Frankforth-Nachmias and Nachmias (2008) contended a sampling size should be a subset of the community. Also, the authors posited a sampling size does not have to be significant because an increase of the sampling size will not correspondingly increase the precision of the sampling results.

The study participants were 10 female nurses who responded to the invitation flyer I placed at the healthcare facility cafeteria requesting respondents to participate in my study. A criterion I used in selecting study participants include the nurses having varying levels of education- Bachelor of Science Nursing (BSN), Registered Nurse (RN) or at least, Licensed Practice Nurse (LPN). Other criteria used included the study participants having or not had readiness training in a disaster condition like bioterrorism and working at the healthcare center.

I used a purposive sampling technique in soliciting information of nurses who would be a good interview participant. In the end, I recorded a list of possible participants, then added numbers to the participants and selected the study participants using the numbers. Interviews captured with Sony audio recorder and manual notetaking, and data collection were done concurrently within 4 weeks.

The study participants were articulate and open in their responses to the interview questions I proffered. Also, the nurses were lucid in offering ideas and suggestions on how to improve the preparedness policies at GHCC. Interviewing and obtaining information from nurses with or without knowledge in biodisaster management working at GHCC assisted in exploring the Healthcare Center bioterrorism preparedness efforts.

Data Analysis

Data analysis comprised examining data and in deriving an empirical conclusion from all sources of data (Yin, 2014). Data analysis was achieved by reviewing the extensive literature on bioterrorism preparedness, GHCC bioterrorism preparedness policies, interview transcripts, and by applying a case study design. Relying on the study

data in addressing the question of exploring factors for improving nurse's preparedness, policies, and practices in New Jersey was an effective tactic.

Also, in the analysis stage, I discussed the theory of robust of transformation which recommended the ways and means organizations can adapt to deal with external catastrophic situations or the negative stressors they collectively encounter (Lengnick-Hall and Beck, 2005). The epidemiological triangle conceptual framework reflecting three variables: external agent, susceptible host, and the environment was used, descriptively, in exploring, and developing a knowledge base of Ebola virus pathogenicity, characteristics, routes of transmission, and infection (Nganwa., et al, 2010).

Data analysis was thematic (see Braun & Clarke, 2012). I intensively explored interview data by repetitively listening to Sony audio-recorded interviews and reading transcribed interview texts. Next, I grouped the data. I manually coded data in NVivo by their relationships. Subsequently, all identified data points with matching codes were clustered under broad themes, reviewed, and refined for more analysis to confirm if they were a fit, and becoming the source of the theme. Interview transcripts are stored in a locked file cabinet at my home. Also, electronic files are stored on my password-protected computer and backed up on a password-protected hard drive.

Data Reliability, Validity, and Generalizability

In print, studies are essential in dealing with the question of exploring factors for improving an organization's bioterrorism preparedness, policies, and practices (Moore, 2011; Yin, 2014). Accordingly, a congressional report of field hearing before the

Committee on Science, House of Representatives was examined (United States. Congress. House, Committee on Science, 2004). Krishan, Kaur, and Sharma's (2017) study on India's preparedness against bioterrorism was studied. Bhatt, Rajesh, and Thakur's (2017) study on the role's knowledge, education, and willingness to participate in bioterrorism was perused. Also, D'Arcangelis's (2017) work on increasing the investigative paraphernalia which the U.S. public health community relies on in safeguarding people of all descent, residing or visiting, who are impacted, or suspected of affected by a bioterror in the United States was examined.

In all, by indulging in these multiple case studies with varying backgrounds, it allowed me to make comparisons (see Darke et al, 1998; Schofield, 2000) which in turn, contributed richly in the analysis of the study. Internal validity was obtained by triangulating data. Clarity, transferability, and validity was accomplished through the use of thick descriptions (Creswell, 2009, p. 200) when recounting some of the key factors for improving nurses's preparedness, policies, and practices for bioterrorism events.

I obtained content validity by communicating directly with the nurses working at the healthcare center to capture their perception on the key factors for improving nurses's preparedness, policies, and practices for bioterrorism events. Gathering and examination of the information from nurses were methodical, documented, and precise (see Brod, Tesler, and Christensen, 2009). The expectations are that the key factors for improving nurse preparedness, policies, and practices for bioterrorism events were clarified.

Case Study Design

In this research, I applied a descriptive case study technique in exploring how Summit Ridge Genesis Healthcare Center will function in New Jersey during a biological terrorism event. Yin (2014) postulated that a case study strategy of inquiry is relevant/applicable if a researcher has no control over events; especially when the foci point is about an occurring spectacle within a realistic context. Also, a case study approach was relevant in understanding the lived experiences of study participants because of the technique, literarily putting a face on any issue or topic that a researcher tends to understudy.

A case study design was more applicable for this study due to the closeness of the case to real-life situations and its multiple wealth of details. In using case study technique, Yin (2009) advised, that the data and evidence from numerous sources such as interviews, observations, documents, including audiovisual, and reports, require unification in a triangulation method. In this single case study, I explored whether New Jersey is ready for Ebola virus terrorist attack.

A case study starts with a wide-ranging literature review (Yin, 2009) outlining contextual data, permitting an earlier clarification of the subject of the study about understudied research problem the researcher envisioned to discourse. Also, a case study starts with an extensive literature review (Yin, 2009). A case study research (CSR) is beneficial in studying a phenomenon (Yin, 2014) such as projects, policies, institutions, or other systems (Creswell, 2014). Dudley and McFee (2005) discussed how preparedness for a biological attack is measured by how it affords the safety of lives,

protection of property, and empowering proper defense against evolving transmittable viruses.

Being of social concern, in this descriptive single case study, I explored factors for improving Summit Ridge Genesis Healthcare Center bioterrorism preparedness, policies, and practices. An EBOV release in New Jersey will create a public health emergency and task its public health system (nurses) (Madad, 2014). How good the nurses respond to the victims will be based on the readiness capabilities at hand.

A descriptive case study is done in obtaining an in-depth understanding of events, decisions, and periods (Yin, 2014). Also, a descriptive case study is done by focusing on, and detailing the nature of a phenomenon through physical artifacts, interviews, and documents, including participant observations. While the primary aim of a descriptive case study is just to study a phenomenon in depth and in detail (Mills, Durepos, & Wiebe, 2010), a case study technique provides a leeway for the person reading the study to see the phenomenon through the researcher's theoretical lens.

Yin (2014) opined a researcher establish a procedure before embarking on data collection. In the setting of a descriptive single case study, an overview must be articulated and specified, the approaches for gathering data in the field, outlined, and the case study research questions must align to the literature. Also, the researcher must clearly state the format the study will be reported. These were clearly outlined in Chapters 1 and 3.

The discoveries of a descriptive case study may be mainly its application to an idea, Yin (2014) stated that a challenge a researcher have is in defining the unit of

analysis. The unit of analysis in a case study includes the phenomenon (the who, or what) of study. This study explored preparedness, policies, and practices that exist for a biological attack in a Healthcare facility. The foci point was the study participants perceptions. Interview question of “what is your perception” and follow-ups such as “how did that make you feel” were proffered.

This study unit of analysis was a descriptive single case study of Summit Ridge Genesis Healthcare Center in West Orange, New Jersey. A descriptive single case study outlines the general character of a phenomenon by critically looking at what is known (theory) about the phenomenon. Challenges in utilizing a descriptive single case study technique include, the study participants may not be forthright in their responses to proffered questions.

Because the discoveries of descriptive of a single case study design may be its application to a notion, a researcher’s prejudice may weigh heavily in designing interview questions to elicit the desired answer. Also, during data analysis, the researcher may exercise the choice of what is reported. Also, the study findings may not be replicable, and the results, open to varying interpretations.

Despite the limitations endemic in a case study design, it remains the best. Yin (2009) postulated, a case study strategy of inquiry is relevant/ applicable if a researcher has no control over events, especially when the foci point is about an occurring spectacle within a realistic context. A case study approach is also relevant in understanding the lived experiences of study participants (Yin, 2014) because of the case study technique literarily putting a face on any issue or topic that a researcher tends to understudy.

A case study design is more relevant due to the closeness of the case to real-life situations and its multiple wealth of details. In using the case study technique, Yin (2009) advised data and evidence from numerous sources such as interviews, observations documents, including audiovisual, and reports, be unified in a triangulation method.

Target Population

The study explored how Summit Ridge Genesis Healthcare Center will function during a biological terrorism event. Underscoring the need to interviewing nurses include: Nurses play active roles in response to bioterrorism by conducting disease surveillance; determining a probable cause of exposure (Mondy, Cardenas, & Avila, 2003), and informing officials of their observations. West, Patel, and Nadel (2014) posited during, and after a bioterrorism event, nurses are in the vanguard in caring for victims, by receiving sufferers into the hospital, triaging, taking vital signs, and serving as the primary link with families.

Throughout a bioterrorism victim's stay, Nurses provide short and long-term care. Training and developing nurses have substantial benefits for the stakeholders, local communities, and businesses that employ nurses. Pertinently, the nurses explored factors for improving nurse preparedness, policies, and practices for bioterrorism events. Also, they talked about bioterrorism preparedness exercise programs conducted by the U.S. government (Klein et al, 2005), and the avenues for reaching and interacting with the stakeholders during bioterrorism events.

The study projected that Summit Ridge Genesis Healthcare Center might be a hub for treating victims in the State of New Jersey if a natural or human biological attack

occurs. Dudley and McFee (2005) discussed how preparedness for a biological attack is measured by how it affords the safety of lives, protection of property, and empowering proper defense against evolving transmittable viruses. Exploring Summit Ridge Genesis Healthcare Center requirements and restrictions were used in determining the readiness level for nurses in responding to a biological attack. The nurses who participated in the interviews had wide-ranging knowledge in biological disaster preparedness.

Measuring Biological Disaster Preparedness

In print, studies in biological disaster preparedness with varying backgrounds were essential in dealing with the question of setting an accurate operational measure in a case study (Moore, 2011; Yin, 2014). In print, studies allowed the research to learn various biological disaster practices and making comparisons (Darke et al, 1998; Schofield, 2000) and enriched the study. In the study, the Health care facility biological disaster preparedness, policies, and practices were explored and compared with published studies to gauge the Healthcare facility level of readiness. Also, I found the areas needing improvement for biological disaster preparedness.

Findings

In analyzing a case study, a task remains how to combine and examine all data collected from different sources to yield an excellent analysis. Yin (2014) contended it entails analyzing all collated data, showcasing the data distinctly from any notion, and looking at different opinions. Consequently, all sources of data such as published research studies on bioterrorism, U.S government bioterrorism policy, and Summit Ridge Genesis Healthcare Center bioterrorism protocol, including nurse interviews were used in

exploring Summit Ridge Genesis Healthcare Center readiness for a Category “A” biological agent release. Also, the study addressed the results and made recommendations.

Whether a state institutes bioterrorism in the quest of national interests (NI) or by an individual or asymmetric group, the goal (psychology) for exploiting terror is to terrorize. The preparedness actions to respond to bioterrorism includes: Prevention, Detection, and Response (PDR), are a state’s prerogative (Garfield, 2005). It makes bioterrorism a social issue, which the study addressed. It is pertinent to note that not dealing with this social problem, of lack of preparedness, a biological agent attack or accidental release, might be the most compelling and challenging to defend.

The study findings and recommendations will be made available to New Jersey policymakers, law enforcement agencies, nurses, and an individual who can utilize the discoveries in the preparedness efforts for a bioterrorism attack/release. The study findings will offer either an outline or a template of readiness for other states in the U.S to utilize or unveil the areas needing enhancement and a chance to redirect resources for New Jersey for better preparedness. Finally, my single case qualitative study will contribute to academic knowledge in biological disaster preparedness, and effect social change by generating new insights that could improve bioterrorism resilience.

Summary

This study answered the principal research question of what are some of the key factors for are improving nurse preparedness, policies, and practices for bioterrorism events through a descriptive case study on the State of New Jersey’s Summit Ridge

Genesis Healthcare Center. This exploration provided an opportunity for the study participants to discuss the factors for improving nurse preparedness, policies, and practices for bioterrorism events. Also, the study participants talked about the bioterrorism preparedness exercise programs conducted by the U.S. government and the avenues for reaching and interacting with the stakeholders during bioterrorism events. The epidemiological triangle conceptual framework reflecting three variables: external agent, susceptible host, and the environment was used, descriptively, in exploring, and developing a knowledge base of Ebola virus pathogenicity, characteristics, routes of transmission, and infection.

Lengnick-Hall and Beck's (2005) theory of ART guided the study in conducting face to face semi-structured interviews of, a sample (n=10) nurses at GHCC to explore factors for improving nurses' preparedness, policies, and practices for bioterrorism events. The face facing semi-structured interviews supported in exploring GHCC bioterrorism readiness efforts. The research gathered information from written articles and books. Also, the study examined New Jersey plans, procedures, and resources in organizational capabilities; operational capabilities; and resource-sharing capability. Chapter 4 dealt with the research analysis.

Chapter 4: Results

Introduction

Owned and operated by Complete Care, Summit Ridge Genesis Healthcare Center is a medical facility with a specialty in providing in-home long and short nursing care for adults. The health facility has a specialty in medical rehabilitation, speech, occupational and respiratory therapies, including individual treatment care plans services in West Orange, New Jersey. The study identified some of the factors for improving nurse preparedness, policies, and practices for bioterrorism events.

This social problem was worthy of study because bioterrorism attacks or accidental EBOV release in New Jersey might be the most compelling and challenging to defend. The effects can go unnoticed but have immediate and enduring horrendous psychological effects on the broader population, and security (Anderson & Bokor, 2012). State governments dutiful preparedness is vital if they are to safeguard public health and safety of their peoples.

The research consisted of using scholarly resources in bioterrorism preparedness, the U.S and state government bioterrorism policy, in conjunction with face- to- face semistructured field interviews in discussing the bioterrorism protocols at Summit Ridge Genesis Healthcare Center in preparing for a biological agent release. Interviews of nurses were thorough, and the relevance and richness of information gathered furthered an understanding of biological agent release preparedness in the facility.

The proliferation of biological weapons prevents drug manufacturing companies from developing some all-purpose therapeutic countermeasures to bioterrorism (Institute

of Medicine (U.S) Forum on Emerging Infections, 2002). Madad's (2014) study indicated that in the event of bioterrorism, nurses would provide care for victims. Therefore, there is a need to strengthen the essential bioterrorism knowledge needs of nurses and reduce adverse health effects and keep fatalities from occurring.

Aghaei and Bagheri (2013) posited that the required knowledge is defined "as the accumulated practical skill or expertise that allows a human to do something smoothly and efficiently" (Von Hippel, 1988, p. 629). According to the authors, the required knowledge includes how nurses can detect the signs of a bioterrorism event, put on and removing personal protective equipment. Also, the required knowledge extends to how nurses can analyze, synthesize data, and apply data to identify patterns of spread; dealing with range and contain more biological outbreaks (Ipe, 2007).

Biological outbreaks are a reality. Whether in the form of a pandemic or epidemic, having scientific knowledge, developing a readiness, and response plan for containment are essential in understanding and dealing with their occurrence. Also, information and maintaining clear avenues for communicating to the stakeholders is crucial in containing its spread (Keller, 2013). Nurses play active roles in response to bioterrorism by conducting disease surveillance, determining a probable cause of exposure (Mondy et al., 2003). Zhong et al. (2014) quantitative cross-sectional study suggested a health care facility having in place "emergency medical response capability, disaster management mechanisms, hospital infrastructural safety, and surge capacity to muster human resources" remain a mean or basis for achieving resilience (p. 6335). Abraham et al. (2012) recommended table-top exercises as an avenue to produce real

discussions that engender cooperative problem resolution between residents of a health facility during emergencies.

Hammond (1966a) contended that humans derive meaning by measuring what they see outwardly to their inner rational models. In revising data, a pattern matching technique, involving comparing a projected theoretical paradigm with an observed pattern (Sinkovics, 2018), was employed. The study participants responses to interview questions were examined and matched with the ideas found in the literature on bioterrorism preparedness. In Chapters 2 and 3, the theory of robust transformation was used in building a theoretical pattern. Also, the epidemiological triangle (ET) was used in describing and discussing the causality of Ebola virus disease. Finally, the research data was compared to other studies to identify the most exceptional practices on bioterrorism preparedness.

Data Collection Process

The interviews I conducted at Healthcare Center conference rooms were the source of data. Ten nurses individually partook in the meetings which lasted between 45 to 60 minutes. Face to face semistructured interviews questions proffered are attached in the study protocol (see Appendix).

The interview questions were primarily about the study participants perceptions and preparedness on bioterrorism protocols in the event of a biological release. All interviews and data collection lasting over 4 weeks were done at the healthcare facility's conference rooms. The conference rooms were conducive for the discussions because of being removed from the floor activities. During every meeting, I iterated the purpose of

the study, interview, and consent forms. Subsequently, the study participants affirmed by signing the consent forms.

Duplicate copies of the consent forms were given to the study participants. The study participants were informed of their rights to withdraw at any time without any fear of penalties. The study participants were advised to share concerns they had by dialing Walden University's phone numbers on the consent forms. Subsequently, the original copies of the consent forms were deposited in marked envelopes and secured in my briefcase.

The study participants were lucid and open in their responses to the interview questions. Where the study participants appeared to be monosyllabic in their reactions to the interview questions, I asked follow-up questions. Interviews were captured with a Sony voice recording device and manual notetaking with my field-notebook.

I reviewed Genesis Healthcare Summit Ridge Center bioterrorism preparedness protocols and nurses' preparedness in the event of a biological release. Internal validity was achieved by triangulating data (see Yin, 2014). At the end of interviews, my Sony audio recording device was placed securely in my briefcase; the interview notes were entered into a PIN-protected document ensuring the confidentiality of the study participants.

Nonconforming Data

The nurses who work in the private sector are protecting public health. The data gained in this study were from interviews, the literature, United States' and New Jersey's biological disaster policy, including Genesis Healthcare Summit Ridge Center disaster

preparedness policy. This research agrees with Fowler (2016) that nurses must participate in social and health policy. The only nonconforming data was the communication aspect with the facility administrator and receptionist.

Data Analysis

The study consisted of interviewing 10 out of the 40 nurses working at the facility. The 10 study participants who responded to the invitation flyer I posted at the facility's cafeteria to participate in my study were selected by purposive sampling technique. Purposive sampling included soliciting information of nurses who would be a good interview participant.

In the end, I recorded a list of possible participants, added numbers to the participants and selected the study participants using the numbers. The 10 study participants and their richness of information were enough and did not pose redundancy challenges. Also, published studies on bioterrorism preparedness, U.S and State of New Jersey bioterrorism preparedness policies, and Genesis Healthcare Summit Ridge Center bioterrorism preparedness protocols were used.

Data analysis was thematic (see Braun & Clarke, 2012). I explored interview data by repetitively listening to audio-recorded interviews and reading transcribed interview texts. Next, I grouped the data; I manually coded in NVivo by their relationships. Subsequently, all identified data points with matching codes were clustered under broad themes, reviewed, and refined for more analysis to confirm if they were a fit, and becoming the source of the theme.

Interview questions posed to the study participants and their responses are as follows:

Item 3: What is your perception of bioterrorism?

Study Participants 3, 4, 5, 6 8, 9, and 10 had a clear understanding of the term bioterrorism. They individually stated it could involve the intentional release of biological agents which could be bacteria like smallpox virus anthrax Fungai or otherwise. Study Participant 2 said it could be in its natural form or a modified form with the intent to cause harm or illness. Study participant 1 could not distinguish between bioterrorism from terrorism. In her view, terrorism is the same as bioterrorism because the intent is to kill people.

Item 4: Does your nursing department have a bioterrorism preparedness and response plan?

All the Study Participants responded by stating that their department does not have a biological release/bioterrorism attack response plan. Instead, what they have had is training on active shooter preparedness and response. Also, the family members of patients will be notified immediately when such incident occur.

Item 5: Please explain any types of special training there is for nurses in GHCC in preparing for a biological attack?

All the Study Participants responded by stating that GHCC does not have special training for nurses in preparing for a biological attack. Rather, the healthcare facility has conducted multiple training on active shooter preparedness and response.

Item 6: What is your perception about the readiness of GHCC for a virulent

Category “A” biological agent such as Ebola virus?

Study Participants 7 and 9 informed that from what they saw on television, the facility was not prepared to respond to a virulent Category “A” biological agent such as Ebola virus release. Study Participant 2 could not imagine a biological agent release occurring at the facility.

Item 7: What is your perception about GHCC coordinating with the State of New Jersey in preparing for a virulent biological agent release?

Study Participants 4, 6, and 9 individually talked about the importance of human and material resource allocation for attending to the victims of biological agent release in New Jersey. The Study Participants responses are in line with the U.S. national policy readiness effort against bioterrorism with direct state application include strengthening the SNS. SNS is managed by the Department of Health and Human Services (HHS) and the Department of Homeland Security (CDC, 2014). The SNS warehouses vaccines, antibiotics, prophylactics, and other medical response materials (CDC, 2015). During a public health emergency, states can request for vaccines, antibiotics, prophylactics, and other medical response materials from the SNS.

Item 8: Can GHCC Coordinate with citizens in the community in preparing for a biological attack?

Study Participant 2 said, based on the healthcare facility guidelines on disaster emergency, nurses will work with patients and their families in preparing for a biological attack. However, study participant 7 could not attest to the facility working with patients

in the community to prepare for a biological attack because most of the patients needed individual guidance or care in their daily activities.

Item 9: Does GHCC coordinate with the State of New Jersey in preparing for a virulent biological agent release?

Study Participants 3, 7, and 10 believed GHCC should work with New Jersey through training activities to prepare. In that case, nurses would know what to do in coordinating with New Jersey in preparing for a virulent biological agent release.

Item 10: Have you participated in the full-scale simulation preparation of a biological attack preparation?

Study Participant 7, who has worked at the facility for 20 years, informed me that there has never been a biological agent/bioterrorism simulation training at the facility. Her response was individually corroborated by all the other study participants.

Item 11: How often are full-scale simulation exercises performed in preparation of a biological attack?

All the Study Participants affirmed individually that Genesis Healthcare Summit Ridge Center does not practice full-scale bioterrorism simulation exercises. Their responses were in line with Niska and Shimzu's (2011) study, which showed that few hospitals in the United States practice simulated comprehensive bioterrorism training. The importance of a full-scale simulated bioterrorism training cannot be overemphasized. A large-scale simulated bioterrorism training enhances readiness, increases the safety of lives, and protects property during natural disasters and human terrorism attacks (National Research Council (US) Panel on Biological Issues, 2002).

Item 12: What are your perceptions in greater detail of what involves a full-scale simulation of a biological attack?

From their responses, all the Study Participants could not explain what should constitute a full-scale simulation of a biological attack exercise. Full-scale simulation of a biological attack, according to Dudley and McFee (2005) empowers the participants a proper defense against evolving transmittable viruses. Also, Abraham., et al. (2012) advised, as with table-top exercises, a simulated extensive bioterrorism training, remains an avenue to produce real discussions that engender cooperative problem resolution between responders during emergencies.

Item 13: What other aspects of table-top exercises does GHCC perform to prepare for a biological attack?

All the Study Participants said GHCC has never organized a table-top exercise for the nurses.

Item 14: Please explain in detail the plans and resources that have been identified in advance if a biological attack were to occur?

All the Study Participants affirmed individually that they have not been informed of the plans and resources that have been identified in advance if a biological attack were to occur. Instead, they have had active shooter preparedness pieces of trainings.

Item 15: Does Genesis Healthcare Center have a designated space or area for victims or suspected victims of a biological agent or bioterrorism and If a bioterrorism attack were to occur in the State of New Jersey?

Study Participants 7 and 9 lamented on the lack of a quarantine area of victims of biological agent release/bioterrorism attack. Continuing, study participants 7 and 9 unanimously said that if there is a biological release/bioterrorism attack, Genesis Healthcare Summit Ridge Center does not have a containment area for quarantining victims. Instead, the dining area will be in use. The importance of Genesis Healthcare Summit Ridge Center, having a bio-hazard containment area cannot be overemphasized. A bio-hazard containment area with negative pressure is designed to prevent or minimize human contact with infected blood or bodily fluids of the Ebola virus patients. Isakov., et al. (2014) explained, that nurse`s, use a bio-hazard containment area to investigate, identify, isolate victims or suspected victims of Ebola virus.

Item 16: In your view, is GHHC equipped, and the nurses prepared to treat victims of a virulent biological agent attack?

Study Participants 1, 2, 7, and 10 did feel that GHCC is not equipped, and the nurses are not prepared to treat victims of a virulent biological agent. They stated that the facility is a nursing home where patients come to convalescence and then go home to their families. Hence, the facility and nurses are not trained to handle a biological release occurrence.

Item 17: Being that GHCC is not a sub-acute a designated hospital, how will the facility coordinate and allocate human resources, please explain?

All the Study Participants informed that they had no idea what the facility would do. Furthermore, they said nurses had not been trained on what to do.

Item 18: In the event of a biological releases/crisis has the Genesis Healthcare

Center recognized how nurses would be tasked with preparedness, response, and assignment?

Study Participant 8 said the facility nurse manager on duty would be the supervisor to coordinate the response activities by contacting the police and fire department. Also, the supervisor on duty would reach out to the CDC bioterrorism emergency response and acute care hospitals through the 9 1 1 telephone system. Study Participant 8 reiterated the importance of following the plan laid out for each Center's specific biological release response by Genesis Healthcare Summit Ridge Center. As outlined in the Healthcare facility handbook on Reporting Requirements and Contact Information, the plan stated: Any employee recognizing biological exposure symptoms notifies the Emergency Director (ED).

1. The Emergency Director immediately dials 911 and area leadership.
2. Restrict building egress and ingress until cleared by authorities.
3. The Emergency Director contacts the CDC bioterrorism Emergency Response office at (770) 488-7100.
4. Employees quickly evacuate all persons from the affected area/s as instructed by leadership.

Item 19: What procedures are in place to broadcast information to the stakeholders or citizens in a well-organized method during a biological agent release?

Study Participants 2, 4, 6, 7, 8, and 9 responded on the importance of coordinating with the stakeholders in the event of a biological agent release/bioterrorism attack. They individually informed that Genesis Healthcare Summit Ridge Center has a protocol in

place that guides how State of New Jersey or facility should respond in case of an emergency. The protocol includes the supervisor on duty, dialing 911, informing the New Jersey Department of Health, and the CDC. Also, family members will be notified immediately.

Item 20: How current policies and practices in GHCC can be improved to prepare nurses for a virulent biological attack response better?

Study Participants 3, 5, 8, 9, and 10 spoke on improving Genesis Healthcare Summit Ridge Center preparedness for biological agent release/bioterrorism attack. Study Participant 2 opined, having trained every day and thinking of biological agent release/bioterrorism attack, is a way to prepare because it can happen at any time. Study Participant 1 said a review of the emergency preparedness once a year is not enough. The Participant opined having preparedness training probably twice a year, and then, possibly, the unit managers in the various units can incorporate same as a routine report during monthly meetings because there is the tendency that the staff might forget what to do.

Study Participant 4 opined instead of once a year Genesis Healthcare Summit Ridge Center could conduct bioterrorism training exercises thrice a year so that nurses can retain the knowledge gained. In that case, when a release occurs, nurses will know how to respond. Finally, Study Participant 6, posited inviting residents living in West Orange to come and witness Genesis Healthcare Summit Ridge Center preparedness for biological agent release/bioterrorism attack exercises.

Evidence of Trustworthiness

The evidence obtained in this study was central in knowing the preparedness level of the State of New Jersey for a biological agent release. Genesis Healthcare Summit Ridge Center disaster preparedness policy gave an insight into the procedures established in place for a biological agent release. Also, the research benefited from the study participants perceptions of biological agent release/bioterrorism attack.

Evidence of Validity

Before embarking on data analysis, I went back to the research site for member checking to review interview transcripts with the study participants from whom the data were obtained. All the study participants individually clarified their responses. I obtained content validity by communicating directly with nurses who work at the Healthcare Center to capture their viewpoint on what the facility can do to prepare and how their experience could be channeled towards bioterrorism preparedness.

Gathering and examination of the information from nurses were methodical, documented, and precise (Brod, Tesler, & Christensen, 2009). My doctoral committee will attest to the correct utility of the qualitative methodology (Creswell, 2009). I obtained clarity, transferability, and validity through the utilization of thick description (Creswell, 2009, p. 200) when recounting some of the key factors for improving nurses preparedness, policies, and practices for bioterrorism events.

Study Findings

A case study finding can be analytically generalized to the study participants on which the studies were based (Yin, 2009). Examples of how case studies where

investigators generalized their results include: Anteby and Molnár (2012), Bingham and Davis, (2012), including Mair, Marti, and Ventresca (2012). Consequently, the findings of this study can be theoretically generalizable to similar incidents and on the study participants (nurses) on which the study was based; effecting a social change. A successful biological agent release/bioterrorism attack in the State of New Jersey would have immediate and long-lasting effects on the economy and physical and psychological effects on the exposed population (Anderson & Bokor, 2012).

My study showed that Genesis Healthcare Summit Ridge Center has the capacity and resources for preparedness and in dealing with the public health challenges posed by biological agent release/bioterrorism attack. My study found that GHCC has not developed a three-tiered disaster preparedness exercises. These include table-top exercise, where staff is exposed to emergency simulation exercises; a functional exercise meant at assessing and appraising designated emergencies and the responsibilities of various departments in a pretend emergency environment. Also, there is not a full-scale exercise model emergency response plan aimed at integrating the U.S. military, local, federal, and regional entities.

My study highlighted that Genesis Healthcare Summit Ridge Center must encourage continuous cycles of disaster preparedness among nurses through training exercises. In constant readiness, the Healthcare Center should develop strategies and capabilities to implement plans. These strategies and skills may help in counteracting the effects of a Category “A” biological agent release in the State of New Jersey.

Summary

As indicated, the Healthcare facility has a specialty in medical rehabilitation, speech, occupational, and respiratory therapies, including individual treatment care plans services. If there is a biological agent release/bioterrorism attack, my study agrees with Grundman (2014) that the study participants (nurses) can prepare and respond to bioterrorism by initially conducting risk assessment involving monitoring and surveillance, risk management comprising preparedness, prevention, and decontamination, including risk communication consisting U.S public health response and management policy.

The study participants responses to the interview questions showed that Genesis Healthcare Summit Ridge Center is a veritable instrument that could strengthen the State of New Jersey efforts in preparing for a biological agent release/bioterrorism attack. The literature review outlined that nurses could prepare for a biological agent release/ by using computers in simulating bioterrorism situations (Nyamathi et al, (2010); Rose and Larrimore (2002).

Likewise, the study participants responses aptly showcased that developing bioterrorism response preparedness consists of a mixture of experience, education, and training that is grounded on leveraging lectures, practical's, and exercise drills. Also, nurse training factor is a necessary and essential asset for a Healthcare facility functioning during and after a biological release or bioterrorism attack. New Jersey should employ proper preparedness that will be needed during the response. These include medical facilities conducting table-top exercises on bioterrorism, having

appropriate quarantine units for use in observing suspected victims and for treating indexed cases.

Furthermore, enhancing communication capabilities such as 911 and the social media for use in disseminating information during the detection of a biological release/bioterrorism attack response are essential. These communication mediums are avenues through which the stakeholders can remain informed of what is happening in their communities. Similarly, notifying the stakeholders can lead to a reduction in the spread of a managed biological agent. Chapter 5 dealt with the study summary and conclusions.

Chapter 5: Discussion, Conclusions, and Recommendations

Overview

The purpose of this case study research, which concentrated on qualitative data, was to explore factors for improving nurse preparedness, policies, and practices for bioterrorism events in Summit Ridge Genesis Healthcare Center in West Orange, New Jersey. The results were used to explore some of the key factors for improving nurse preparedness, policies, and practices for bioterrorism events. Carafano et al. (2014) informed there is little data, indicating the United States has the capacities to deal with an outbreak of virulent EBOV underscoring a need, in refining the public health emergency readiness structures transversely throughout the homeland.

An EBOV release of any means can result in losses (Dudley & McFee, 2005; Hamburg, 2001). Its successes will be gauged by the panic and disruption it instills in a polity, how much it overwhelms a community, and challenge of the poise, citizen's repose in the states. Klitzman (2015) and WHO (2015) contended that understanding how to prepare for the public health challenges posed by EBOV can enhance New Jersey's efforts to deal with its release, and in treating the confirmed cases.

Lengnick-Hall and Beck's (2005) ART recommended the ways and means organizations can adapt to deal with external catastrophic situations or the negative stressors they collectively encounter such as Ebola virus release. The authors directed institutions focus on the conditions which induced the change, create new solutions and responses, and expand and expend its organizational strategy, human and financial capital resources towards the external catastrophic situation for the future viability of the

organization. Additionally, ART specified redirecting excess resources towards developing and expanding organizational response capabilities. Lengnick-Hall and Beck (2005) concluded the benefit of ART is that uncertainty is a temporary, transient moment where institutions should be fast and nimble in adopting new strategic processes for responding to the dilemma, achieving stability, and future viability of the establishment

Prior bioterrorism studies which described a biological attack scenario were read. A study (Aquino, 2016) re-counted the circumstances by which Ebola virus can quickly disperse into unsuspecting populations by nurses, was studied to assist in future bioterrorism preparedness. Also, another study (Günther et al., 2011) informed how a virologist infected herself with a needle tainted with ZEBOV and concealed traces of blood discussed in Chapter 2 substantiated the possibilities of a biological agent released in U.S soil.

This research focused on understanding how a Category “A” biological agent such as Ebola virus could be released in New Jersey and assessed whether Genesis Healthcare Summit Ridge Center is prepared for such an event. For example, Aquino’s (2016) study showcased how a fundamentalist nurse who was returning overseas from service from Ebola virus-infested nation can willfully spread of the Ebola virus and constitute substantive national security and public health danger. Aquino surmised that after autoinoculating and becoming overwhelmed, a person (nurse), would have 2 to 21 days before becoming indicative. With the United States not having compulsory isolation policy in place for nurses without alleged Ebola contact, choosing a mass-transit transportation system, the bioterrorist could then set out on an assignment to circulate the

virus. Consequently, if a synchronized squad of fundamentalist persons were to exploit the Ebola virus, the consequence could be more overwhelming.

By using the pattern matching technique, I analyzed data by examining scholarly literature on bioterrorism preparedness studies. The academic literature suggested that it is possible to lessen the consequences of bioterrorism through a clearly defined operative readiness, and by spotlighting the exceptional value, nurses bring to these conditions. But the knowledge and skill need of nurses- patient assessment, diagnosis, and personal protection regimes, and clinical skills- to be operative have not been part of their specialized training.

Nurses are not only unacquainted with the hospital's bioterrorism program; they suspect the plans do not protect nurses. Therefore, nurses must be aware of hospital policies and personal protection regimes. Foremost, nurses should have the required medical skills to be operative. Hence, if the nurses working at Genesis Healthcare Summit Ridge Center lack the knowledge and skill need of nurses, the pattern of appropriate preparedness may not match.

Some of the study participants acknowledged that Genesis Healthcare Summit Ridge Center has a bioterrorism preparedness protocol, but there are ongoing issues such as practicing bioterrorism simulation exercises and lack of a quarantine area of victims of biological agent release/bioterrorism attack. Genesis Healthcare Summit Ridge Center needs to be conducting bioterrorism training twice in a year and probably with the unit managers in the various units, incorporating same as a routine when giving reports during monthly meetings.

Genesis Healthcare Summit Ridge Center has not developed three-tiered disaster preparedness exercises. These include table-top exercise, where the staff will be exposed to bioterrorism simulation exercises. A functional exercise is designed for assessing and appraising designated emergencies and the responsibilities of various departments in a pretend emergency environment.

GHCC does not have a full-scale exercise model emergency response plan, which is aimed at integrating the U.S. military, local, federal, and regional entities. Exposing nurses to emergency simulations exercise is important because Dudley and McFee (2005) averred a simulated comprehensive bioterrorism training empowers proper defense against evolving transmittable viruses. Also, Abraham et al. (2012) advised that table-top exercises such as simulated extensive bioterrorism training remain an avenue to produce real discussions that engender cooperative problem resolution between responders during emergencies.

Preparedness

With an increase in the possibility of extremists, terrorists, and criminals using biological agents in bioterrorism; including biological agents unintended release on U.S. soil, there is a need for nurses to prepare. Ebola virus (agent) is transmitted from the host (animal to human and from human to a human) through unprotected contact with bodily fluids of a person with symptoms or deceased; gestation period ranges from 2 days to 3 weeks (Passi, Sharma, Dutta, Dudeja, & Sharma, 2015). The authors stated that its cautionary signs include severe hemorrhagic fever, diarrhea, headache, vomiting, higher points of blood urea nitrogen, and muscle pain.

Passi, Sharma, Dutta, Dudeja, and Sharma (2015), informed that other indicators of EBOV transmission include higher points of blood in indexed patient's urine, nitrogen, aspartate aminotransferase, and creatinine. Other signs include sore throat dizziness, weakness, and conjunctivitis. Sissoko et al. (2017) posited that Ebola virus has been found in the breast milk of female victims. Also, patients recovering from EBOV retain traces of EBOV in the vagina (female), rectum, and in semen (male) for more than 90 days; intensifying the risks of EBOV transmission through sexual intercourse (Passi, Sharma, Dutta, Dudeja, & Sharma, 2015). Grundman's (2014) study showed nurses could also prepare and respond to bioterrorism by initially conducting risk assessment involving monitoring and surveillance, risk management comprising preparedness.

The study participants are experienced in trauma and nursing care, but not in bioterrorism/biological agent release preparedness or management. The study participants are not trained in clinically managing indexed bioterrorism patients. The literature review in Chapter 2 showed nurses can prepare and respond to bioterrorism by initially conducting risk assessment involving monitoring and surveillance. Also, the research showcased nurses could adapt and respond to bioterrorism/biological agent release by performing risk management comprising preparedness, prevention and decontamination, and through risk communication-consisting U.S. public health response and management policy (Grundmann, 2014).

However, there are continuing challenges at Genesis Healthcare Summit Ridge Center. They include the healthcare facility not practicing bioterrorism simulation exercises and the facility lacks a quarantine area for victims of biological agent

release/bioterrorism attack. Genesis Healthcare Summit Ridge Center in West Orange needs to start practicing concentric cycles of bioterrorism training, and then, the unit managers in the various units need to incorporate it as a routine when giving reports during monthly meetings.

Furthermore, the study participants discussed the importance of coordinating with the stakeholders, such as the CDC in the event of a biological agent release/bioterrorism attack. Genesis Healthcare Summit Ridge Center has a protocol in place that guides how each facility in the United States should respond in case of an emergency. In the event of a biological agent release or bioterrorism attack, the facility nurse manager on duty will be the supervisor and coordinate response activities by contacting the police and the CDC bioterrorism emergency response center, and acute care hospitals through the 911 telephone system.

Genesis Healthcare Summit Ridge Center communication protocol is in line with the U.S. national policy readiness effort against bioterrorism, wherein during a biological terrorist attack or other public health emergencies, a state governor requests and, within 12 hours, receives assistance from the federal government through the SNS. The SNS protocol is jointly managed by the DHSS and the DHS. The SNS warehouses vaccines, antibiotics, prophylactics, and other medical response materials. Gottron (2010) informed that newly manufactured medicines and serums made under Project BioShield-2004 are retained in the SNS. States in the United States have strategies for distributing the supplies they receive from the SNS. The study participants reiterated the importance of

following the plan laid out for each center's specific biological release response by Genesis Healthcare Summit Ridge Center.

The study participants spoke on the lack of a quarantine area, which is essential in managing indexed patients of biological agent release/bioterrorism attack. They stated that if there is a biological release/bioterrorism attack, Genesis Healthcare Summit Ridge Center cannot quarantine victims. Instead, the dining area will be used. The importance of Genesis Healthcare Summit Ridge Center, having a biohazard containment area cannot be overemphasized. Isakov et al. (2014) explained that the nurses working in a biohazard containment area use technologies to investigate, identify, and isolate victims or suspected victims. According to the authors, a biohazard containment area room with negative pressure is designed to prevent or minimize human contact with infected blood or bodily fluids of Ebola virus patients.

Genesis Healthcare Summit Ridge Center has working relationships with hospitals around New Jersey who in the event of a biological agent release/ bioterrorism will be contacted through the 911 telephone system. Consequently, enhancing the 911 communication system and social media for use in disseminating information during the detection of a biological release/bioterrorism attack response are essential. These communication mediums are avenues through which the stakeholders can remain informed of what is happening in their communities. Also, the stakeholders remaining informed can lead to a reduction in the spread of a managed biological agent.

Interpretation of the Study Findings

This study showed that New Jersey is ready in the event there is a Category “A” biological pathogen such as Ebola virus release/bioterrorism. The qualitative case study identified some of the critical factors for improving nurse preparedness, policies, and practices for bioterrorism events by using Genesis Healthcare Summit Ridge Center as the unit of analysis. The healthcare facility has a specialty in medical rehabilitation, speech, occupational, and respiratory therapies, including individual treatment care plans services.

The Federal Emergency Management Agency averred that preparing for a disaster involves continuously planning, managing, organizing, training, equipping, exercising, and improving activities. Also, it engenders effective coordination, and the enhancement of capabilities for use in dealing with a natural or human-made disaster. The U.S. policy for health and medical systems-emergency preparedness and response protocol, comprised of NDMS and MMRS, showed how healthcare workers and medical facilities could lessen injury and losses during disaster occurrences and supporting response efforts (Cooksey, 2004). For example, throughout responding to the September 11th, 2001 terrorist attacks, NDMS and MMRS were used, and have remained the major healthcare protocol for use in impending terrorist attacks.

The U.S. Bioterrorism Act of 2002 provides funding for New Jersey government through the HRSA. New Jersey has a cabinet-level policymaking body that is responsible for managing statewide actions regarding domestic preparedness for a bioterrorism attack. Also, New Jersey has an office of homeland security and preparedness which

develops bioterrorism preparedness plans and activities (Ziskin, 2007). In all, New Jersey has suitable resources for use in responding to a biological attack. Still, New Jersey preparedness for and responding to the act of bioterrorism hinges on New Jersey's public health infrastructure.

The preparedness actions will involve prevention, detection, and response (PDR). Garfield (2005) postulated prevention entails regulating the environment, agriculture, access to most biological and chemical agents. Detection covers providing education and training to the nurse, enhancing surveilling techniques diagnosis of diseases, and response involves developing response plans and capabilities for treating bioterrorism sufferers.

Wilson et al. (2008) informed that a healthcare facility preparedness for a biological agent release necessitates the preparation of paraphernalia and procedures that will be needed once disaster strikes. Genesis Healthcare Summit Ridge Center has a protocol in place and human resources for use in responding to a biological agent release/bioterrorism attack:

- Genesis Healthcare Summit Ridge Center has a protocol in place that guides how each state or facility should respond in case of emergency.
- Genesis Healthcare Summit Ridge Center nurses can prepare and respond to bioterrorism/biological agent release by conducting risk management comprising preparedness, prevention and decontamination, and through risk communication-consisting U.S. public health response and management.

- Genesis Healthcare Summit Ridge Center has working relationships with hospitals around New Jersey, which if there is a biological agent release/ bioterrorism, will be contacted through the 911 telephone system.
- Genesis Healthcare Summit Ridge Center in West Orange nurses can prepare for a biological agent release/ by using computers in simulating bioterrorism situations.
- Genesis Healthcare Summit Ridge Center lacks a quarantine area which is essential in conducting risk assessment involving monitoring and surveilling managing indexed patients of biological agent release/bioterrorism attack.
- Genesis Healthcare Summit Ridge Center has not developed three-tiered disaster preparedness exercises. These include table-top exercises, where staff will be exposed to emergency simulation exercises meant at assessing and appraising designated emergencies and the responsibilities of various departments in a pretend emergency environment.
- Genesis Healthcare Summit Ridge Center does practice a FSE. During responding to a disaster, an FSE model emergency response plan is aimed at integrating the U.S. military, local, federal, and regional entities into a joint command.
- Genesis Healthcare Summit Ridge Center bioterrorism policy is in line with the U.S. national policy readiness effort against bioterrorism, which during a biological terrorist attack or any public health emergencies, a state governor, requests and, within 12 hours, receives assistance from the federal government through the SNS.

- Genesis Healthcare Summit Ridge Center has a procedure in place for coordinating with the stakeholders such as the CDC during a biological agent release/bioterrorism attack.
- Genesis Healthcare Summit Ridge Center does not practice concentric bioterrorism simulation exercises or, a cyclic bioterrorism training, where the unit managers in the various units, incorporating same, as a routine when giving reports during monthly meetings.

Study Recommendations

1. Genesis Healthcare Summit Ridge Center should invest and build a quarantine area, which is essential in conducting risk assessment involving monitoring and surveilling managing indexed patients of biological agent release/bioterrorism attack.

2. Genesis Healthcare Summit Ridge Center should practice concentric bioterrorism simulation exercises or, a cyclic bioterrorism training, where the unit managers in the various units, include same, as a routine when giving reports during monthly meetings.

3. Genesis Healthcare Summit Ridge Center has working relationships with hospitals around New Jersey who in the event of a biological agent release/ bioterrorism will be contacted through the 911 telephone system. Consequently, enhancing the 911 communication system and the social media for use in disseminating information during the detection of a biological release/bioterrorism attack response are essential. These communication mediums are avenues through which the stakeholders can remain

informed of what is happening in their communities. Also, the stakeholders remaining informed can lead to a reduction in the spread of a managed biological agent.

4. Genesis Healthcare Summit Ridge Center should develop a three-tiered disaster preparedness exercises. These include table-top exercise, where nurses are exposed to bioterrorism simulation exercises; a functional exercise meant for assessing and appraising designated emergencies and the responsibilities of various departments in a pretend emergency environment.

5. Also, Genesis Healthcare Summit Ridge Center should develop a full-scale exercise (FSE) model emergency response plan aimed at integrating the U.S. military, local, federal, and regional entities.

Limitations of Study

A limitation of this study is that a unit of analysis was utilized to identify some of the key factors for improving nurse preparedness, policies, and practices for bioterrorism events in the State of New Jersey. Also, the sample size for this study, $n=10$ as in qualitative research, is small. But as Yin (2009) espoused, larger sample size and prodigious data may not indeed, lead to more information or generalization.

Besides, I utilized academic literature in understanding the processes of bioterrorism preparedness. In turn, it led to identifying the best practices and factors for improving nurse preparedness, policies, and practices for bioterrorism. A Category “A” EBOV release by humans accidentally or while perpetrating terror through unsophisticated delivery resulting in small casualties or by carefully planned attack can result in losses (Dudley & McFee, 2005; Hamburg, 2001). It would have immediate and

long-lasting effects on the economy and physical and psychological effects on the exposed population (Anderson & Bokor, 2012).

Recommendations for Further Study

A Category “A” biological agent such as Ebola virus release in New Jersey will task its public health organizations and caregivers such as nurses will bear the burden. New Jersey should learn the lessons from the 2001 Anthrax attacks. Also, New Jersey should learn the lessons of the 2014 Ebola crises which originated from Africa, its transportation and subsequent release on U.S soil.

How well nurses respond to the victims will be based on the availability of the resources and readiness capabilities. Without adequate preparation, EBOV release may have immediate and long-lasting effects on the New Jersey economy, and physical impact on the exposed population. Efforts to improve understandings of how to prepare for the public health challenges posed by Ebola virus can enhance the efforts to deal with its release, and in treating the confirmed cases.

Genesis Healthcare Summit Ridge Center practicing concentric bioterrorism simulation exercises or inculcating cyclic bioterrorism training, where the unit managers in various units, incorporating same, as a routine when giving reports during monthly meetings remains a key. Further studies could asses the critical factors on improving GHCC Certified Nursing Assistants (CNA`s) preparedness, policies, and practices for bioterrorism.

Implications

This qualitative single case study is vital for the citizens residing in New Jersey and for the visitors to the state. The study availed me an opportunity to explore what Summit Ridge Genesis Healthcare Center might need to prepare for a Category “A” biological agent release. All through data collection, it was self-evident that some of the nurses did not have a clear perception of bioterrorism, or the preparedness actions that will be needed in attending to a biological agent release. Some reasoned in error, that because they work in a nursing home, are less likely to encounter a person with Ebola virus.

The research revealed the need to prepare nurses working at Summit Ridge Genesis Healthcare Center and in other nursing homes for bioterrorism. As McCreight’s (2015) study showed, failures to develop and sustain a contingency plan due to reliance on the state, could induce a cataclysmic upheaval. Also, Moore’s (2011) doctoral study found that the communities who lack preparation may experience chaos and an increase in casualties during a biological attack.

The instructive social change implicit in this study has significant implications for the State of New Jersey policymakers, and for the Healthcare Center leadership in preparing for EBOV terrorist attacks. Also, the study has social change implications for the nurses who would provide care to the victims of EBOV. In the course of interacting with the nurses during interviews, they became more aware of the preparedness activities that will be needed in responding to a Category “A” biological agent release in the State of New Jersey. The information will spur nurses to call for a recurring table-top

bioterrorism simulation exercise. As Abraham et al. (2012) advised, a table-top exercise remains an avenue to produce real-time discussions that engender cooperative problem resolutions between respondents during actual emergencies.

The nursing curriculum is the roadmap for a nursing career. However, courses for a Licensed Practice Nurse (LPN), Registered Nurse, (RN), and Bachelor of Science (BSN) vary by school. The nursing curriculum in most institutions does not cover hospital bioterrorism training, leaving nurses un-prepared in discharging their role. Smith and Hewison's (2012) narrative mixed-methods study, showed that the Nursing Emergency Preparedness Education Coalition (NEPEC) (2003) required nurses to be knowledgeable in four vital academic areas: assessment, critical thinking, communication, and technical skills, but does not include the principles of disease and infection control, or training on bioterrorism.

Nyamathi et al. (2010) study recommended including bioterrorism study as part of a continuing education class. Their study showed that developing bioterrorism response preparedness consists of a mixture of experience, educational training that is grounded in leveraging lectures, and practical. Also, that nurse training factor is a required and essential asset for a hospital functioning during and after a biological release or bioterrorism attack.

Finally, a policy change in nurse academic curriculum which stipulates nursing schools, include bioterrorism preparedness education as a part of their curriculum, has real consequences for a positive to social change. This study recommends nursing schools adding risk assessment- monitoring and surveillance, risk management

comprising preparedness, prevention and decontamination, and risk communication consisting of U.S public health response and management policy in their curriculum.

Risk Assessment

According to Grundmann (2014) during risk assessment modeling, nurses should consider: (1) that an unintended Ebola virus release can occur. (2) Nurses should reflect that extremists/terrorists, and criminals are aware of the potentials, and destructive capabilities of Ebola virus, (3) have access to Ebola virus and intention using Ebola virus in furthering jihad or by extremist, for personal expression of dissatisfaction against the U.S homeland; and may be an action which may or may not require an organizational leadership. (4) Nurses should contemplate that extremists/terrorists and criminals can release Ebola virus in the U.S through a human or animal. Also, nurses should reflect and plan for a response to Ebola virus release on U.S soil involving quarantining and caring for the victims in their health care facility.

Monitoring

Nurses should be made aware that monitoring a biological agent threat is complex and challenging; their symptoms can be the same or unspecified. Some signs may be immediate, while some may take time (days and weeks) in manifesting, hence, causing a delay in their early diagnosis (Pappas, Panagopoulou, & Akritidis, 2009). During monitoring modeling, nurses should consider ways of informing the public to take proper measures and avoid a public panic. The nurse risk-management model must cover the actors (terrorists, governments, individuals) method of release, the likelihoods associated with Ebola virus, the area where a release can occur, and the type of readiness and

treatment (accessibility to hospital, serum, treatment plan, impact on the economy, and fatality) for the population (Grundmann, 2014). The totality of risks is then linked with the expenses for monitoring and investigation.

Surveillance

During risk surveillance modeling, Tyshenko (2007) advised teaching nurses how to practice surveillance modeling using the epidemiological investigation process (EIB). EIB process involves looking at the rate of disease occurrence, spread, and death of victims in each population; including the forms and likelihoods of disease occurring. Also, Grundmann (2014) suggested surveillance modeling include the response time and how long it takes for the disease (Ebola virus) to incubate in victims before its known symptoms become apparent. These are necessary for reducing the likely spread of released Ebola virus and increasing the survival rate victims.

Risk Management Modelling

How to prepare for and managing a biological agent release or bioterrorism attack is challenging because of synchronizing and managing the resources from the municipal, state, and federal government it will require. But with the direction of the CDC and the Health Resources and Services Administration (HRSA), Raber, Hibbard, and Greenwalt, (2011) recommended training nurses to identify the signs of a biological agent release and its exposure to victims may limit its spread among the population at risk.

Preparedness modeling should extend to looking at access to the hospital, isolating the victims, requesting and receiving aid from the strategic stockpiles within 24 hours, and treating the victims. Also, preparedness modeling should extend to how a state using its

communication tools in reaching the public in the languages people understand, and how a state governor, making a public health emergency declaration may affect the process.

The U.S Public Health and Security and Bioterrorism Preparedness and Response Act (PH&SBP) of 2002 authorized the CDC to provide funding to states for Public Health Emergency Preparedness and Response (PHEPR). States have various PHEPR curriculum, while some have formed partnerships. For example, the States of New Jersey Hackensack University hospital School of Public Health, and New York-University at Albany, School of Public Health, and Columbia University: Mailman School of Public Health, are partners in strengthening the professional competence of their public health workforce.

Conclusion

I used the qualitative technique in conducting the study to identify some of the factors for improving nurse preparedness, policies, and practices for bioterrorism events. The qualitative technique is consistent with understanding the lived experiences of study participants (Yin, 2009). I used the Genesis Healthcare Summit Ridge Center, as the unit of analysis. The Healthcare facility has a specialty in medical rehabilitation, speech, occupational, and respiratory therapies, including individual treatment care plans services.

There are studies in the United States (U.S) which examined state government preparedness for a bioterrorism attack (Garfield, 2005; Grundmann, 2014; Leavitt & Beacham, 2002; Murphy, 2004; Rickles & Catarious, 2015; and Ziskin & Harris, 2007). Studies (Garza, 2012; Gursky & Bice, 2013; Ross, Crowe, & Tyndall; 2015; and The

College of Physicians of Philadelphia, 2015) apprised how to prepare and the federal agencies which are preparing for biological agent release. But it seems minuscule research has been done to inform state-level public health agencies and other relevant entities. Conducting a case study was imperative in understanding this social issue (Yin, 2009). In addition to face to face semi-structured interviews, and participant observation, this research utilized books and articles to support the study. The triangulation of data was of immense help in conducting the study.

Also, there is little data, indicating states in the U.S have the capacities to deal with an outbreak of virulent Ebola Virus Disease (EBOV) unleashed by man or released by nature; underscoring a need, in refining the public health emergency readiness structures transversely throughout the U.S (Carafano, Florance, & Kaniewski, 2014).

The findings of my study showed that New Jersey has the material resources and human capacity for use in preparing for a biological agent release. However, Genesis Healthcare Summit Ridge Center practicing concentric bioterrorism simulation exercises or inculcating cyclic bioterrorism training, where the unit managers in the various units, incorporating same, as a routine when giving reports during monthly meetings remains a key. Also, Genesis Healthcare Summit Ridge Center should invest and build a quarantine area which is essential in conducting risk assessment involving monitoring and surveilling managing indexed patients of biological agent release/bioterrorism attack.

References

- Abraham, R. T., Walls, R. T., Fischer, M., Markovic-Reed, S., Solovieva, T. I., Russell, F. K., & Ducatman, A. M. (2012). Table-top scenarios for realism in bioterrorism and threat preparedness. *West Virginia Medical Journal*, (6), 12. PMID: 23472535
- Aghaei, N., & Bagheri Nesami, M. (2013). Bioterrorism education effect on knowledge and attitudes of nurses. *Journal of Emergencies, Trauma & Shock*, 6(2), 78-82. doi:10.4103/0974-2700.110747
- Agold-Rich, L. (2014). *Exclusive: was Ebola designed as bioterrorism weapon and is already airborne? Texas nurse provides terrifying report*. Retrieved from Libertynews.com/2014/10/exclusive-was-Ebola-designed-as-bioterrorism-weapon-and-is-already-airborne-texas-nurse-provides-terrifying-report-breaking-exclusive-report/
- Akins, R. B., Williams, J. R., Silenas, R., & Edwards, J. C. (2005). The role of public health nurses in bioterrorism preparedness. *Disaster Management & Response: MR: An Official Publication of The Emergency Nurses Association*, 3(4), 98-105. doi: org/10.1016/j.dmr.2005.07.004
- Ali, F. (2006). Rocking the cradle to rocking the world: The role of Muslim female fighters. *Journal of International Women's Studies*, 8(1), 21-35. Retrieved from <http://vc.bridgew.edu/jiws/vol8/iss1/2>
- Anderson, P. D., & Bokor, G. (2012). Bioterrorism: Pathogens as weapons. *Journal of Pharmacy Practice*, 25(5), 521-529. doi:10.1177/0897190012456366

- Anteby, M. and Molnár, V. (2012). Collective memory meets organizational identity: remembering to forget in a firm's rhetorical history. *Academy of Management Journal*, 55, 515–540. doi: org/10.5465/amj.2010.0245
- Aquino, L. (2016). Radicalized health care workers and the risk of Ebola as a bioterror weapon. *Journal of Bioterrorism & Biodefense* 7,146. doi:10.4172/2157-2526.1000146
- Armstrong, M. (2012). Rehearsing for the plague: Citizens, security, and simulation. *Canadian Review of American Studies*, 42(1), 105-120. doi:10.3138/cras.42.1.105
- Barras, V., & Greub, G. (2014). History of biological warfare and bioterrorism. *Clinical Microbiology and Infection*, 20(6), 497-502. doi:10.1111/1469-0691.12706
- Bennett, R. L. (2006). Chemical or biological terrorist attacks: an analysis of the preparedness of hospitals for managing victims affected by chemical or biological weapons of mass destruction. *International Journal of Environmental Research and Public Health*, 3(1), 67-75. doi: 10.3390/ijerph2006030008
- Bhatt, S., Rajesh, G., & Thakur, D. (2017). Knowledge, perceived need for education, and willingness to participate in bioterrorism preparedness among students in an Indian dental institute: a questionnaire study. *Medical Journal of Dr. D.Y. Patil University*, 10(6), 526–531. doi: 0.4103/MJDRDYPU.MJDRDYPU_61_17
- Bielecka, A., & Mohammadi, A. A. (2014). State-of-the-art in biosafety and biosecurity in european countries. *Archivum Immunologiae et Therapiae Experimentalis*, 62(3), 169–178. doi:10.1007/s00005-014-0290-1

- Bingham, C. B. and Davis, J. P. (2012). Learning sequences: their existence, effect, and evolution. *Academy of Management Journal*, 55, 611–641.
doi:10.5465/amj.2009.0331
- Braun, V., & Clarke, V. (2012). Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 57-71). City, State: Publisher.
doi:10.1037/13620-004
- Brod, M., Tesler, L., & Christensen, T. (2009). Qualitative research and content validity: developing best practices based on science and experience. *Quality of Life Research*, 18(9), 1263-1278. doi:10.1007/s11136-009-9540-9
- Burroughs, T., Knobler, S., Lederberg, J., & Institute of Medicine, (. (U.S.). (2002). *The emergence of zoonotic diseases: Understanding the impact on animal and human health - Workshop summary*. Washington, D.C., National Academies Press
- Cameron, P. & Rainer T. (2003). SARS: A wake-up call for a Healthcare system under stress. *Emergency Medicine* 15(5–6), 409–412. doi:10.1046/j.1442
- Carafano, J. J., Florance, C., & Kaniewski, D. (2015). The Ebola outbreak of 2013–2014: An assessment of U.S. actions. *Heritage Foundation*. Special report no. 166.
Retrieved from <http://www.heritage.org/homeland-security/report/the-Ebola-outbreak-2013-2014-assessment-us-actions>
- Carus, S. W. (2005). Rajneeshees. *Encyclopedia of Bioterrorism Defense*.
doi:10.1002/0471686786.ebd0104

- Chalk, P. (2014). The faceless national security threat. *Rand Corporation*. Retrieved from <http://www.rand.org/blog/2014/09/the-faceless-national-security-threat.html>
- Chaliand, G., & Blin, A. (2007). *The history of terrorism: From antiquity to Al Qaeda*. Berkeley, CA, University of California Press
- Chappell, B. (2015). NPR.org. *Health care worker tests negative for ebola in nj, stays in quarantine*. Retrieved from <https://www.npr.org/sections/thetwo-way/2014/10/25/358795868/health-care-worker-tests-negative-for-ebola-in-nj-stays-in-quarantine>
- Cenciarelli, O., Rea, S., Carestia, M., D'Amico, F., Malizia, A., Bellecci, C., Pasquale, G., Gucciardin, A & Fiorito, R. (2013). *Bioweapons and bioterrorism: A review of history and biological agents*. *Defence S&T Technical Bulletin*, 6(2), 111. Retrieved from http://www.mastercbrn.com/uploads/various/201411111898129478_Paper_Bio.pdf
- Chess C, & Clarke L. (2007). Weapons of mass destruction. Facilitation of risk communication during the anthrax attacks of 2001: the organizational backstory. *American Journal of Public Health*, 97(9), 1578–1583. doi10.2105/AJPH.2006.099267
- Clauset, A., Heger, L., Young, M., & Gleditsch, K. S. (2010). The strategic calculus of terrorism: Substitution and competition in the Israel—Palestine conflict. *Cooperation and Conflict*, 45(1), 6–33. doi:10.1177/0010836709347113
- Cohen, N. J., Brown, C. M., Alvarado-Ramy, F., Bair-Brake, H., Benenson, G. A., Chen,

T.-H., & Cetron, M. S. (2016). Travel and border health measures to prevent the international spread of Ebola. *MMWR Suppl 2016;65(Suppl-3):57–67*.

doi:10.15585/mmwr.su6503a9

Cooksey, J. A. (2004). Terrorism preparedness: Federal medical response programs and the health workforce. *Illinois Regional Health Workforce Center*. Retrieved from <http://www.ihrp.uic.edu/files/Terrorism%20Preparedness.pdf>

Cole, L. A. (2012). Bioterrorism: still a threat to the united states. *CTC Sentinel*.

Retrieved from <https://www.ctc.usma.edu/posts/bioterrorism-still-a-threat-to-the-united-states>

Coltart, E. M., Johnson, A.M., & Whitty, C.J. M. (2015). Role of healthcare workers in early epidemic spread of Ebola: Policy implications of prophylactic compared to reactive vaccination policy in outbreak prevention and control. *BMC Medicine*, 13, 27. doi:10.1186/s12916-015-0477-2

Cooper, C., McCaul., Hamilton, R., Delvare, I., Moonsamy, J. G., & Mueller, K.

(1989/90). Race relations survey. *South African Institute of Race Relations*.

Retrieved from

<https://www.sahistory.org.za/sites/default/files/SAIRR%20Survey%201989-90.pdf?cv=1>

Craft, D. W., Lee, P. A., & Rowlinson, M.-C. (2014). Bioterrorism: A laboratory who does it? *Journal of Clinical Microbiology*, 52(7), 2290–2298.

doi:10.1128/JCM.00359-14

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods*

- approaches*. (3rd eds). Los Angeles, California. SAGE Publications, Inc. USA
- Creswell, J. W. (2012). *Qualitative inquiry and research design: Choosing among five approaches, 3rd edition*. SAGE Publications, Inc. USA
- Cronin, A. K. (2003). Terrorist motivations for chemical and biological weapons Use: Placing the threat in context. Retrieved from <http://fas.org/irps/crs/RL31831>
- D’Arcangelis, G. (2006). Reframing the “securitization of public health”: A critical race perspective on post-9/11 bioterrorism preparedness in the US. *Critical Public Health*, 27(2), 275–284. doi:10.1080/09581596.2016.1209299
- Department of Homeland Security. (2014). *Patient decontamination in a mass chemical exposure incident: national planning guidance for communities*. Retrieved from <http://www.phe.gov/Preparedness/responders/Documents/patient-decon-natl-plng-guide.pdf?c>
- Donahue, D.A; Cunnion, S. O; Balaban, C.D & Sochats, K. (2012). The all needs approach to emergency response. *Homeland Security Affairs* 8. Article 1. Pp 1-17. Retrieved from <https://www.hsaj.org/articles/204>
- Dudley, G & McFee, R. B. (2005). Preparedness for biological terrorism in the United States: Project Bioshield and beyond. *Journal of the Osteopathic Association*. 105(9), 417-424. PMID: 16239492
- Gera, P., Gupta, A., Verma, P., Singh, J., & Gupta, J. (2017). *Recent advances in vaccine development against Ebola threat as bioweapon*. *Virusdisease*, 28(3), 242–246. doi:10.1007/s13337-017-0398-0
- Gottron, F. (2010). Project Bioshield: Purposes and authorities. *International Journal of*

- Terrorism & Political Hot Spots*, 5(3), 489-496. Retrieved from <https://fas.org/sgp/crs/terror/RS21507.pdf>
- Grimes D. & Mendias E. (2010). Nurses' intentions to respond to bioterrorism and other infectious disease emergencies. *Nursing Outlook* 58, 10–16. doi: 10.1016/j.outlook.2009.07.002.
- Green, M. S., Zenilman, J., Cohen, D., Wisner, I., & Balicer, R. D. (Eds.). (2007). *Risk assessment and risk communication strategies in bioterrorism preparedness*. NATO Security through Science Series. doi:10.1007/978-1-4020-5808-0
- Feldmann, H. (2014). Ebola -- A growing threat? *The New England Journal of Medicine*, 371(15), 1375-8. Retrieved from <https://www.semanticscholar.org/paper/Ebola--a-growing-threat-Feldmann/d2462430297004ee37a72d98758420c28f6d1954>
- Fong, I., & Alibek, K. (2010). *Bioterrorism and infectious agents*. New York, NY: Springer Science & Media, Inc
- Fowler, R. A., Fletcher, T., Fischer, W. 2., La Montagne, F., Jacob, S., Brett-Major, D., & Bausch, D. (2014). Caring for critically ill patients with Ebola virus disease. Perspectives from West Africa. *American Journal of Respiratory and Critical Care Medicine*, 190(7), 733-737. doi:10.1164/rccm.201408-1514CP
- Fowler, M. D. (2016). Nursing's Code of Ethics, Social Ethics, and Social Policy. *The Hastings Center Report*, 46 Suppl 1, S9–S12. doi: 10.1002/hast.624
- Fradkin, H., Haqqani, H., & Brown, E. (2010). Current trends in islamist ideology. Vol. 1. *Center on Islam, Democracy, and the Future of the Muslim World*, Hudson

Institute. Washington DC

- Frankfort-Nachmias, C. & Nachmias, D. (2008) *Research Methods in the Social Sciences. 7th Edition*, Worth, New York.
- Frischknecht, F. (2003). The history of biological warfare. *EMBO Reports*. 2003; 4 (Suppl 1): S47-S52. doi: 10.1038/sj.embor.embor849
- Fry-Pierce, C. C., & Lenze Jr., P. E. (2011). Bioterrorism and U.S. domestic preparedness: Bureaucratic fragmentation and american vulnerability. *Journal of Homeland Security & Emergency Management*, 8(1), 1-16. doi:10.2202/1547-7355.1887
- Furmanski, M. (2014). Lab escapes and “Self-fulfilling prophecy” epidemics. *Center for Arms Control and Nonproliferation*. Retrieved on January 29, 2017 from <http://armscontrolcenter.org/wp-content/uploads/2016/02/Escaped-Viruses-final-2-17-14-copy.pdf>
- Garfield, R. (2005). State preparedness for bioterrorism and public health emergencies. *The Commonwealth Fund*. Retrieved from http://www.commonwealthfund.org/usr_doc/829_Garfield_bioterrorism.pdf
- Garza, A. (2012). The truth about biowatch: The importance of early detection of a potential biological attack. *Homeland Security*. Retrieved from <http://www.dhs.gov/blog/2012/07/12/truth-about-biowatch>
- Gershon, R. R., Orr, M. G., Zhi, Q., Merrill, J. A., Chen, D. Y., Riley, H. E., & Sherman, M. F. (2014). Mass fatality preparedness among medical examiners/coroners in the United States: a cross-sectional study. *BMC Public Health*, 14, 1275.

<http://doi.org/10.1186/1471-2458-14-1275>

- Ghayourmanesh, S. P., & Hawley, H. M. (2015). Ebola virus. *Magill's Medical Guide (Online Edition)*. Retrieved from Retrieved from <http://search.ebscohost.com.ezproxy.northland.ac.nz:83/login.aspx?direct=true&db=ers&AN=86194072&site=eds-live>
- GlobalSecurity.Org. (2015). Al-qaida / al-qaida (the base). *GlobalSecurity.Org*. Retrieved from <http://www.globalsecurity.org/military/world/para/al-qaida.htm>
- Goodwin, V. T., & Corley, A. (2015). Nurse safety from exposure to chemicals and biologics: hazard assessment, decontamination and the use of personal protective equipment. *Health Science Journal*, 9(6), 1-9. Retrieved from <http://www.hsj.gr/medicine/nurse-safety-from-exposure-to-chemicals-and-biologics-hazard-assessment-decontamination-and-the-use-of-personal-protective-equipme.php?aid>
- Gostin, L. O., & Friedman, E. A. (2015). A retrospective and prospective analysis of the west African Ebola virus disease epidemic: robust national health systems at the foundation and an empowered WHO at the apex. *Lancet (London, England)*, 385(9980), 1902-1909. doi:10.1016/S0140-6736(15)60644-4
- Green, H. E. (2014). Use of theoretical and conceptual frameworks in qualitative research. *Nurse Researcher*. 21, 6, 34-38. doi: 10.7748/nr.21.6.34. e1252
- Grimes, D. & Mendias, E. (2010). Nurses' intentions to respond to bioterrorism and other infectious disease emergencies. *Nursing Outlook* 58, 10-16. doi: 10.1016/j.outlook.2009.07.002

- Grinnell, M., Dixon, M. G., Patton, M., Fitter, D., Bilivogui, P., Johnson, C., & Raghunathan, P. (2015). Ebola virus disease in health care workers--guinea, 2014. *Morbidity & Mortality Weekly Report*, 64(38) 1083-1087 5p.
doi:10.15585/mmwr.mm6438a6
- Grundmann, O. (2014). The current State of bioterrorist attack surveillance and preparedness in the US. *Risk Management and Healthcare Policy*, 7, 177–187.
doi.10.2147/RMHP.S56047
- Gunther, S., Feldmann, H., Geisbert, T., Hensley, L., Rollin, P., Nichol, S., & Schmiedel, S. (2011). Management of accidental exposure to Ebola virus in the biosafety level 4 laboratory, Hamburg, Germany. *Journal of Infectious Diseases*, 204S785-S790. doi:10.1093/infdis/jir298
- Gursky, E. A., & Bice, G. (2013). Assessing a decade of public health preparedness: Progress on the precipice? *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*. 10(1), 55-65. doi:10.1089/bsp.2011.0085
- Hacker, A. J., & Settles, D. (2015). *Theory & Conceptual Frameworks*. Walden University
- Hamburg, M. A. (2001). Preparing for and Preventing Bioterrorism. *Issues in Science & Technology*, 18(2), 27. Retrieved from http://issues.org/18-2/p_hamburg/
- Hammersley, M., & Atkinson, P. (2007). *Ethnography: principles in practice* (3rd ed.). New York: Taylor & Francis
- Harmon, K. (2011). Nearly 400 Accidents with dangerous pathogens and biotoxins reported in U.S. labs over 7 Years. *Scientific American*. Retrieved on January 28,

2017 from <https://blogs.scientificamerican.com/observations/nearly-400-accidents-with-dangerous-pathogens-and-bio-toxins-reported-in-u-s-labs-over-seven-years/>

- Henao-Restrepo, A. M., Longini, I. M., Egger, M., Dean, N. E., Edmunds, W. J., Camacho, A., & Røttingen, J. (2015). Articles: Efficacy and effectiveness of an rVSV-vectored vaccine expressing Ebola surface glycoprotein: interim results from the Guinea ring vaccination cluster-randomised trial. *The Lancet*, 386, 857-866. doi:10.1016/S0140-6736(15)61117-5
- Houghton, C., Casey, D., Shaw, D., & Murphy, K. (2013). Rigour in qualitative case-study research. *Nurse Researcher*, 20(4), 12–17. doi: 10.7748/nr2013.03.20.4.12.e326
- Huntington, P. (2007). Al-Qaeda: a blueprint for international terrorism in the twenty-first century? *Defence Studies*, 4:2, 229-255. doi: 10.1080/1470243042000325922
- Inglesby, T. V., & Relman, D. A. (2015). How likely is it that biological agents will be used deliberately to cause widespread harm? *EMBO Reports*, 1(2), 127-130. doi 10.15252/embr.201541674
- Institute of Medicine. (1988). Committee for the study of the future of public health. *The Future of Public Health*. National Academy Press. Washington DC. USA
- Institute of Medicine (US) Committee on assuring the health of the public in the 21st Century. (2002). *The Future of the Public's Health in the 21st Century*. Washington (DC): National Academies Press. USA. Retrieved from:

<https://www.ncbi.nlm.nih.gov/books/NBK221231/>

- Ipe, M. (2007). Bioterrorism preparedness in public health: Knowledge needs for robust transformations. *ERIC*. Retrieved from <http://files.eric.ed.gov/fulltext/ED504552.pdf>
- Ippolito G., Puro V., & Heptonstall, J. (2006). Hospital preparedness to bioterrorism and other infectious disease emergencies. *Cellular and Molecular Life Sciences* 63, 2213–2222. doi: 10.1007/s00018-006-6309-y
- Isakov, A., Jamison, A., Miles, W., & Ribner, B. (2014). Safe management of patients with serious communicable diseases: Recent experience with Ebola virus. *Annals of internal medicine*, 161(11) 829-830. doi:10.7326/M14-2084
- Jacobs, M. K. (2004). The history of biological warfare and bioterrorism. *Dermatol Clin.* 2004; 22:231-246. doi: 10.1016/j.det.2004.03.008
- Jansen, H. J., Breeveld, F. J., Stijnis, C., & Grobusch, M. P. (2014). Biological warfare, bioterrorism, and biocrime. *Clinical Microbiology and Infection: The Official Publication of The European Society of Clinical Microbiology and Infectious Diseases*, 20(6), 488-496. doi:10.1111/1469-0691.12699
- Jones, T. (2002). Bioterrorism preparedness – what progress has congress made since September 2001? *Policy, Politics & Nursing Practice* 3(3), 217–219. doi.org/10.1177/15254402003003004
- Kadanali, A., & Karagoz, G. (2015). An overview of Ebola virus disease. *Northern clinics of Istanbul*, 2(1), 81–86. doi:10.14744/nci.2015.97269
- Kamata, T., Natesan, M., Warfield, K., Aman, M., & Ulrich, R. (2014). Determination of

- specific antibody responses to the six species of Ebola and marburg viruses by multiplexed protein microarrays. *Clinical and Vaccine Immunology*, 21(12), 1605-1612. doi: 10.1128/CVI.00484-14
- Keller, R. (2013). Bioterrorism and the pandemic potential. *Stratfor*. Retrieved on January 29, 2017 from <https://www.stratfor.com/weekly/bioterrorism-and-pandemic-potential>
- Klein, K., Brandenburg, D., Atas, J., & Maher, A. (2005). The use of trained observers as an evaluation tool for a multi-hospital bioterrorism exercise. *Prehospital and Disaster Medicine*, 20(3), 159-163. doi:10.1017/S1049023X00002387
- Klitzman, R. (2015). Evolving challenges and research-needs concerning Ebola. *American Journal of Public Health*, 105(8), 1513–1515. doi.org/10.2105/AJPH.2015.302757
- Klotz, L. C., & Sylvester, E. J. (2014). The Consequences of a lab escape of a potential pandemic pathogen. *Frontiers in Public Health*, 2, 116. doi: 10.3389/fpubh.2014.00116
- Krishan, K., Kaur, B., & Sharma, A. (2017). India's preparedness against bioterrorism: bio-defence strategies and policy measures. *Current Science*, 113(9), 1675–1682. doi: 10.18520/cs/v113/i09/1675-1682
- Kutscher, B., Robeznieks, A., & Rubenfire, A. (2014). CDC and hospitals hit reset on Ebola preparedness. *Modern Healthcare*, 44(42), 8-9. PMID: 25513690
- Lengnick-Hall, C. A., & Beck, T. E. (2005). Adaptive fit versus robust transformation: How organizations respond to environmental change. *Journal of*

Management, 315, 738-757. doi: 10.1177/0149206305279367

- Leavitt, J., & Beacham, T. (2002). Policy perspectives. The effects of September 11 on health policy: the budget, corporate greed, and health issues compete with bioterrorism for policymakers' attention. *American Journal of Nursing*, 102(9), 99-102. doi: 10.2105/ajph.93.8.1226
- Leroy, E. M., Gonzalez, J., & Baize, S. (2011). Ebola and marburg hemorrhagic fever viruses: Major scientific advances, but a relatively minor public health threat for Africa. *Clinical Microbiology and Infection*, 17(7) 964-976. doi:10.1111/j.1469-0691.2011.03535.x
- Levy, B. S., & Sidel, V. W. (2012). *Terrorism and Public Health A Balanced Approach to Strengthening Systems and Protecting People. (2nd Ed)*. New York, NY: Oxford
- Lipsitch, M., & Bloom, B. R. (2012). Rethinking biosafety in research on potential pandemic pathogens. *Mbio*, 3(5), doi:10.1128/mBio.00360-12c
- Lipsitch, M., & Inglesby, T. V. (2014). Moratorium on research intended to create novel potential pandemic pathogens. *mBio*, 5(6), e02366–14. doi: 10.1128/mBio.02366-14
- Madad, J. (2014). Bioterrorism: An emerging global health threat. *Journal of Bioterrorism & Biodefense*. 5:1. doi: 10.4127/2157-2526.1000129
- Malet, D., & Korbitz, M. (2015). Bioterrorism and local agency preparedness: Results from an experimental study in risk communication. *Journal of Homeland Security & Emergency Management*, 12(4), 861-873. doi:10.1515/jhsem-2014-0107

- Mair, J., Marti, I. & Ventresca, M.J. (2012). Building inclusive markets in rural Bangladesh: how intermediaries work institutional voids. *Academy of Management Journal*, 55, pp. 819–850. doi: 10.5465/amj.2010.0627
- Maron, D, F. (2015). Weaponized Ebola: Is it really a bioterror threat? *Scientific American*. Retrieved on January 14, 2017 from <https://www.scientificamerican.com/article/weaponized-Ebola-is-it-really-a-bioterror-threat/>
- Martínez, M.J., Salim, A.M., Hurtado, J.C., Kilgore, P. E. (2015) *Ebola virus infection: overview and update on prevention and treatment*. 4: 365. doi.org/10.1007/s40121-015-0079-5
- Mate, S. E., Kugelman, J. R., Nyenswah, T. G., Ladner, J. T., Wiley, M. R., Cordier-Lassalle, T., & Palacios, G. (2015). Molecular evidence of sexual transmission of Ebola virus. *The New England Journal of Medicine*, 373(25), 2448-2454. doi: 10.1056/NEJMoa1509773
- Martin, J. W., Christopher, G. W., & Eitzen, E. M. (2007). *History of biological weapons: from poisoned darts to intentional epidemics*. Textbooks of military medicine. Medical aspects of biological warfare. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.175.2994&rep=rep1&type=pdf>
- Martin W. (2004). Legal and public policy responses of states to bioterrorism. *American journal of public health*, 94(7), 1093–1096. doi:10.2105/ajph.94.7.1093
- Mays, N., Pope, C., & Popay, J. (2005). Systematically reviewing qualitative and

- quantitative evidence to inform management and policy-making in the health field. *Journal of Health Services Research & Policy* 10(Suppl. 1), 6–20. doi: 10.1258/1355819054308576
- McCreight, R. (2015). Constitutional authority in crisis: examining a State Governor's emergency powers. *Homeland Security & Emergency Management*, 12(1) 23–42. doi.org/10.1515/jhsem-2014-0095
- McFee, R. B., Leikin, J. B., & Kiernan, K. (2004). Preparing for an era of weapons of mass destruction (WMD)—are we there yet? Why we should be concerned. Part II. *Vet Hum Toxicol*. 46(6):347–351. PMID: 15587263
- Meisels, T. (2008). *The Trouble with Terror*. Critical Review of International Social and Political Philosophy, 12:3, 331-351, doi: 10.1080/13698230903127853
- Mills, A. J., Durepos, G., & Wiebe, E. (2010). *Encyclopedia of case study research (Vols. 1-0)*. Thousand Oaks, CA: SAGE Publications, Inc. doi: 10.4135/9781412957397
- Miro, S., & Kaufman, S.G. (2005). Anthrax in New Jersey: A health education experience in bioterrorism response and preparedness. *Health Promotion Practice*. Vol. 6 no. 4 430-436. doi: 10.1177/1524839904263673
- Mondy, C., Cardenas, D., & Avila, M. (2003). The Role of an Advanced Practice Public Health Nurse in Bioterrorism Preparedness. *Public Health Nursing*, 20(6), 422. doi:10.1046/j.1525-1446
- Moore, J. T. (2011). Assessing city preparedness for a biological attack. Walden Dissertations and Doctoral Studies. Retrieved from <http://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=1913&context>

dissertation

- Murphy, J. K. (2004). After 9/11: priority focus areas for bioterrorism preparedness in hospitals. *Journal of Healthcare Management / American College of Healthcare Executives*, 49(4), 227-235. PMID: 15328657
- Nappo, S. A., Iafrate, G. B., & Sanchez, Z. M. (2013). Motives for participating in a clinical research trial: a pilot study in Brazil. *BMC Public Health*, 13, 19.
<http://doi.org/10.1186/1471-2458-13-19>
- National Institute of Allergy and Infectious Diseases. (2016). *NIAID* emerging infectious diseases/pathogens. *NIH*. Retrieved from
<https://www.niaid.nih.gov/topics/biodefenserelated/biodefense/pages/cata.aspx>
- Nationsonline.org. (2019). *Reference Maps of New Jersey (NJ)*. Nationsonline.org
Retrieved from
https://www.nationsonline.org/oneworld/map/USA/new_jersey_map.htm?cv=1
- Nekoie-Moghadam, M., Kurland, L., Moosazadeh, M., Ingrassia, P. L., Della Corte, F., & Djalali, A. (2016). Tools and checklists used for the evaluation of hospital disaster preparedness: A systematic review. *Disaster Medicine and Public Health Preparedness*, 1-8. doi: 10.1017/dmp.2016.30
- Nganwa, D., Habtemariam, T., Tameru, B., Gerbi, G., Bogale, A., Robnett, V., & Wilson, W. (2010). Applying the epidemiologic problem-oriented approach (EPOA) methodology in developing a knowledge base for the modelling of hiv/aids. *Ethnicity & Disease*, 20(1 Suppl 1), S1–173–7. PMID: 20521410
- Niska, R. W., & Shimizu, I. M. (2011). Hospital preparedness for emergency response:

- United States, 2008. *National Health Statistics Reports*, (37), 1-14. PMID: 21476489
- NJ.gov. (1996-2017). *Reference Map of New Jersey (NJ)*. Retrieved on January 1, 2017 from http://www.nationsonline.org/oneworld/map/USA/new_jersey_map.htm
- Nosal, J. (2014). The Strategic Surprise of the 2004 Madrid Bombings. *Security Outlines*. Retrieved from <http://www.securityoutlines.cz/the-strategic-surprise-of-the-2004-madrid-bombings/>
- Nyamathi A., Casillas A., King M., Gresham L., Pierce E., Farb D., Weichmann, C. (2010). Computerized bioterrorism education and training for nurses on bioterrorism attack agents. *The Journal of Continuing Education in Nursing*. 41(8) 375-384. doi: 10.3928/00220124-20100503-01
- Osterholm, M. T., Moore, K. A., Kelley, N. S., Brosseau, L. M., Wong, G., Murphy, F. A., & Kapetshi, J. (2015). Transmission of Ebola viruses: What we know and what we do not know. *American Society for Microbiology*, 6(2), e00137-15. doi: 10.1128/mBio.00137-15
- O'Sullivan, E., Rassel, E., & Berner, M. (2008). *Research Methods for Public Administrators*. 5th Edition. Pearson Learning Solutions. USA
- Pappas, G., Panagopoulou, P., & Akritidis, N. (2009). Reclassifying bioterrorism risk: are we preparing for the proper pathogens? *Journal of Infection and Public Health*. 2009;2(2):55–61. doi: 10.1016/j.jiph.2009.03.002
- Parahoo, K. (2006). *Nursing Research: Principles, Process and Issues*. 2nd edition. Palgrave Macmillan, Basingstoke

- Parachini, J. (2001). Combating Terrorism: Assessing the Threat of Biological Terrorism. Testimony Before the Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform U.S. House of Representatives. *Rand*. Retrieved from <http://www.rand.org/content/dam/rand/pubs/testimonies/2005/CT183.pdf>
- Passi, D., Sharma, S., Dutta, S. R., Dudeja, P., & Sharma, V. (2015). Ebola Virus Disease (The Killer Virus): Another Threat to Humans and Bioterrorism: Brief Review and Recent Updates. *Journal of clinical and diagnostic research: JCDR*, 9(6), LE01–LE8. doi:10.7860/JCDR/2015/13062.6100
- Patel, K., Nadel, J., & West, M (2014). Redesigning the care team: The critical role of frontline workers and models for success. *Brookings*. Retrieved from <https://www.brookings.edu/research/redesigning-the-care-team-the-critical-role-of-frontline-workers-and-models-for-success/>
- Pinto V. N. (2013). *Bioterrorism: Health sector alertness*. *Journal of natural science, biology, and medicine*, 4(1), 24–28. doi:10.4103/0976-9668.107256
- Pirofski, L., & Casadeva, A. (2012). Q&A: What is a pathogen? A question that begs the point. *Bmc Biology*, 10. doi: 10.1186/1741-7007-10-6
- Polit, D. F., & Tatano-Beck, C. (2004). *Nursing research: principles and methods*. Seventh edition. Lippincott Williams and Wilkins, Philadelphia PA
- Prakash N., Sharada P., & Pradeep G. (2010). Bioterrorism: Challenges and considerations. *Journal of Forensic Dental Sciences*. 2010; 2 (2):59-62. *US National Library of Medicine National Institutes of Health*. doi:10.4103/0975-

1475.81283

- Pratt, W., Wang, D., Nichols, D., Luo, M., Woraratanadharm, J., Dye, J., & Dong, J. (2010). Protection of Nonhuman Primates against two species of Ebola virus infection with a single complex adenovirus vector. *Clinical and Vaccine Immunology*, 17(4), 572-581. doi: 10.1128/CVI.00467-09
- Raber, E., Hibbard, W. J., & Greenwalt, R. (2011). The national framework and consequence management guidance following a biological attack. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*. 9(3):271–279. doi: 10.1089/bsp.2011.0035
- Rathert, C., Williams, E.S., Lawrence, E. R., et al. (2012). Emotional exhaustion and workarounds in acute care, cross sectional tests of a theoretical framework. *International Journal of Nursing Studies*. 49(8):969-977. doi: 10.1016/j.ijnurstu.2012.02.011
- Rebmann, T. (2006). Defining bioterrorism preparedness for nurses: Concept analysis. *National Center for Biotechnology Information, U.S. National Library of Medicine*, 54(5) 623-32. PMID: 16722960
- Richter, A & Denise, S. (2006). Assessment of public health infrastructure to determine public health preparedness. *Homeland Security Affairs 2, Article, 11*, 1-25.
Retrieved from <https://www.hsaj.org/articles/686>
- Rickles, A., & Catarious, E. (2015). Assessing U.S. community preparedness in the case of Ebola virus disease using pandemic planning for the EBOV response. *Obsidian Analysis*. Retrieved from <http://www.obsidiandc.com/cms/wp->

content/uploads/2015/05/Assessing-US-Community-Preparedness-in-the-Case-of-Ebola-Virus-Disease-0515.pdf

- Riedel, S. (2004). Biological warfare and bioterrorism: a historical review. *Proceedings Baylor University Medical Center Proceedings*, 17(4), 400–406. doi: 10.1080/08998280.2004.11928002
- Rim, K.-T., & Lim, C.-H. (2014). Biologically hazardous agents at work and efforts to protect workers' health: A review of recent reports. *Safety and Health at Work*, 5(2), 43–52. doi: 10.1016/j.shaw.2014.03.006
- Roberts S.H. & Bailey J.E. (2011). Incentives and barriers to lifestyle interventions for people with severe mental illness: a narrative synthesis of quantitative, qualitative and mixed methods studies. *Journal of Advanced Nursing*, 67(4), 690–708. doi: 10.1111/j.1365-2648
- Robson, C. (2002). *Real World Research*. Second edition. John Wiley & Sons, Chichester. USA
- Rogstad, K. E., & Tunbridge, A. (2015). Ebola virus as a sexually transmitted infection. *Current opinion in infectious diseases*, 28(1), 83-85. doi: 10.1097/QCO.0000000000000135
- Rohrer, J. E., Grover, M. L., & Moats, C. C. (2013). Utilising the epidemiologic triad in analyzing quality improvement data: an antibiotic use for respiratory infections as a case example. *Quality in Primary Care*, 21(3), 165-170. PMID: 23968266
- Rose, M., & Larrimore K. (2002) Knowledge and awareness concerning chemical and biological terrorism: continuing education implications. *The Journal of*

Continuing Education in Nursing, 33(6), 253–258. PMID: 12442873

- Ross, A., Crowe, S., & Tyndall, M. (2015). Planning for the next global pandemic. *International Journal of Infectious Diseases*, 3889-94.
doi: 10.1016/j.ijid.2015.07.01
- Schieffelin, J. S., Shaffer, J. G., Goba, A., Gbakie, M., Gire, S. K., Colubri, A., & ... Garry, R. F. (2014). Original article: Clinical illness and outcomes in patients with Ebola in sierra leone. *The New England Journal of Medicine*, 3712092-2100.
doi:10.1056/NEJMoa1411680
- Schofield, J. W. (2000). Increasing generalizability of qualitative research. In Gomm R, Hammersley M, Foster P (Eds) *Case Study Method*. Sage Publications, London
- Scott, J. T., Sesay, F. R., Massaquoi, T. A., Idriss, B. R., Sahr, F., & Semple, M. G. (2016). Post-Ebola Syndrome, Sierra Leone. *Emerging infectious diseases*, 22(4), 641–646. doi:10.3201/eid2204.151302
- Sell, T. K., & Watson, M. (2013). Federal agency biodefense funding, fy2013-fy2014. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*, 11(3), 196–216. doi:10.1089/bsp.2013.0047
- Sinclair, R., Boone, S.A., Greenberg, D., Keim, P., Gerba. C.P (2008). *Persistence of Category a select agent in the environment*. (2008). *Applied and Environmental Microbiology*. Vol. 74, No. 3, p. 555–563. doi:10.1128/AEM.02167-07
- Singh, S. K & Kuhn, J. H. (2019). *Defense against biological attacks* vol I. Springer, Chaim. doi:10.1007/978-3-030-03053-7
- Sinkovics, N. (2018). Pattern Matching in Qualitative Analysis. In: *The SAGE Handbook*

of Qualitative Business and Management Research Methods: and Challenges.

doi: 10.4135/9781526430236.n28

Sissoko, D., Keïta, M., Diallo, B., Aliabadi, N., Fitter, D. L., Dahl, B. A., & Duraffour, S. (2017). Ebola virus persistence in breast milk after no reported illness: a likely source of virus transmission from mother to child. *Clinical infectious diseases: an official publication of the Infectious Diseases Society of America*, 64(4), 513–516. doi:10.1093/cid/ciw793

Smith, C., & Hewison, A. (2012). Are nurses prepared to respond to a bioterrorist attack: a narrative synthesis. *Journal of Advanced Nursing*, 68(12), 2597-2609. doi:10.1111/j.1365-2648.2012.06061

Smith, E. L., Kerner, R. L., Jr, Schindler, J. S., & DeVoe, B. (2015). *Professional development implications of Ebola virus disease education: part I*. *Journal of Continuing Education in Nursing*, 46(1), 8–9. doi.org/10.3928/00220124-20150109-12

Spoons, C. (2012). Protecting first responders from biological agents. *Domestic Preparedness. Com*. Retrieved on January 15, 2017 from <https://www.domesticpreparedness.com/preparedness/protecting-first-responders-from-biological-agents>

Stewart, S. (2014). Evaluating Ebola as a biological weapon. *STRATFOR*. Retrieved from <https://www.stratfor.com/weekly/evaluating-Ebola-biological-weapon>

Sutton, V. (2004). Environment and public health in a time of plague. *American Journal of Law & Medicine*, 30(2-3), 217-236. doi: 10.1177/009885880403000205

- The Centers for Disease Control & Prevention. (2011). *Public health preparedness capabilities: National standards for State and local planning*. CDC. Retrieved from http://www.cdc.gov/phpr/capabilities/DSLR_capabilities_July.pdf
- The Centers for Disease Control & Prevention. (2014). *Ebola outbreak in West Africa*. CDC. Retrieved from <http://www.cdc.gov/vhf/Ebola/outbreaks/guinea/index.html>
- The Centers for Disease Control & Prevention. (2014). *Guidelines for evaluation of US patients suspected of having Ebola Virus Disease*. Retrieved from <http://emergency.cdc.gov/HAN/han00364.asp>
- The College of Physicians of Philadelphia. (2015). *Biological weapons, bioterrorism, and vaccines*. The College of Physicians of Philadelphia. Retrieved from <http://www.historyofvaccines.org/content/articles/biological-weapons-and-vaccines>
- Thompson, L. (2018). *The threat of biological warfare is increasing, and the U.S. isn't ready*. Forbes. Retrieved from <https://www.forbes.com/sites/lorenthompson/2018/04/09/biowar-a-guide-to-the-coming-plague-years/#56a7b3675fe5>
- Tyshenko, M. G. (2007). Management of natural and bioterrorism induced pandemics. *Bioethics*, 21(7):364–369. doi: 10.1111/j.1467-8519.2007.0057
- Urbano, M. (2006). *The Complete Bioterrorism Survival Guide*. Boulder, Colorado Sentient Publications
- United States Census Bureau. (2018). Quick fact about New Jersey. Retrieved from <https://www.census.gov/quickfacts/fact/table/nj/PST045218#PST045218>

- United States. Congress. House. Committee on Science. (2004). Bioterrorism preparedness. Retrieved from <https://ezp.waldenulibrary.org/login?url=https://search.ebcohost.com/login.aspx>
- U.S Census Bureau. (2016). *Quick Facts New Jersey*. Retrieved on January 1, 2017 from <https://www.census.gov/quickfacts/table/PST045215/34>
- U.S Department of Defence. (2015). *Review committee report: inadvertent shipment of live bacillus anthracis spores by dod*. Retrieved from https://dod.defense.gov/Portals/1/features/2015/0615_lab-stats/Review-Committee-Report-Final.pdf
- Vallido T., Wilkes L., Canter B. & Jackson D. (2010) Mothering disrupted by illness: a narrative synthesis of qualitative research. *Journal of Advanced Nursing*, 66(7), 1435–1445. doi: 10.1111/j.1365-2648.2010.05350
- Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC medical research methodology*, 18(1), 148. doi:10.1186/s12874-018-0594-7
- Vogel, G. (2014). Bat-filled tree may have been ground zero for the Ebola epidemic. *Sciencemag*. Retrieved on February 4 from <http://news.sciencemag.org/africa/2014/12/bat-filled-tree-mayhave-been-ground-zero-Ebola-epidemic>
- Von Hippel, E. (1998). Economics of product development by users: The impact of "sticky" local information. *Management Science*, 44(5) 629-644. Retrieved from

<http://pubsonline.informs.org/doi/abs/10.1287/mnsc.44.5.629>

- Wagner, L. (2015). *New jersey governor facing lawsuit from nurse quarantined during ebola scare*. NPR.org. Retrieved from <https://www.npr.org/sections/thetwo-way/2015/10/22/450908372/new-jersey-governor-facing-lawsuit-from-quarantined-nurse>
- Weicker, L. P. (2013). Reauthorizing the pandemic and all-hazards preparedness act will help protect against bioterrorism. In R. Espejo (Ed.), *Opposing Viewpoints. Bioterrorism*. Detroit: Greenhaven Press. USA
- West, M., Patel, K., & Nadel, J. (2014). Redesigning the care team: the critical role of frontline workers and models for Success. *Brookings*. Retrieved from <https://www.brookings.edu/research/redesigning-the-care-team-the-critical-role-of-frontline-workers-and-models-for-success/>
- Wilson, S.A., Temple, B.J., Milliron, M.E., Vazquez, C., Packard, M.D., & Rudy, B.S. (2008). The lack of disaster preparedness by the public and its effect on communities. *The Internet Journal of Rescue and Disaster Medicine*. 2008 *Volume 7 Number 2*. Retrieved from <https://www.ispub.com/journal/the-internet-journal-of-rescue-and-disaster>
- World Health Organization. (2014). Barriers to rapid containment of the Ebola outbreak Retrieved from <http://www.who.int/csr/disease/Ebola/overview-august-2014/en/>
- World Health Organization. (2015). *Ebola vaccines, therapies, and diagnostics*. Retrieved from http://www.who.int/medicines/emp_Ebola_q_as/en/
- World Health Organization. (2015). *Ebola response: What needs to happen in 2015*.

Retrieved from <http://www.who.int/csr/disease/Ebola/one-year-report/response-in-2015>

World Health Organization. (2016). *Clinical care for survivors of Ebola virus disease*.

Retrieved from

http://apps.who.int/iris/bitstream/10665/204235/1/WHO_EBOV_OHE_PED_16.1_eng.pdf

Yin, R. K. (2009). *Case study research: design and methods, 4th edition*. SAGE Publications, Inc, USA

Yin, R. K. (2014). *Case study research: design and methods. (5th Ed.)*. Thousand Oaks. SAGE Publications. USA

Ying, C., Yu, L. I., & Jie, Y. H. (2014). Ebola virus disease: General characteristics, thoughts, and perspectives. *Biomed Environ Sci*, 27(8) 651–653. doi: 10.3967/bes2014.100

Young, C. & Persell, D. (2004) Biological, chemical and nuclear terrorism readiness: major concerns and preparedness of future nurses. *Disaster Management and Response* 2, 109–114. doi: 10.1016/j.dmr.2004.08.010

Zapanta, P., & Ghorab, S. (2014). Age of Bioterrorism: Are You Prepared? Review of Bioweapons and Their Clinical Presentation for Otolaryngologists. *Otolaryngology-Head and Neck Surgery*, 151(2), 208-214. doi: 10.1177/0194599814531907

Zhong, S., Clark, M., Hou, X. Y., Zang, Y., & FitzGerald, G. (2014). Validation of a framework for measuring hospital disaster resilience using factor analysis.

International journal of environmental research and public health, 11(6), 6335–6353. doi:10.3390/ijerph110606335

Ziskin, L. H., & Harris, D.A. (2007). State Health Policy for Terrorism Preparedness.

American Journal of Public Health, 97(9), 1583–1588.

doi:10.2105/AJPH.2006.101436.

Appendix: Case Study Interview Questions Protocol

A) Introduction to the Case Study

- Research Question- What are some of the key factors for improving nurse preparedness, policies, and practices for bioterrorism events?
- Theories of Robust Transformation (ART) and Epidemiological Triangle (ET) – Nurses must examine the theories to improving preparedness, policies, and practices for bioterrorism events

B) Data Collection Process

Unit of Analysis- Nursing department at Summit Ridge Genesis Healthcare Center, New Jersey (GHCC)- Nurses in the department spots and investigates the circumstances related to the existence of disease in nature and treats victims.

Location: The GHCC is in the city of West Orange, New Jersey.

Participants: 10 nurses were interviewed.

Preparation

I discoursed the plans, policies pertaining to nurses' preparedness for a biological attack and outline strategies. The nurses were interviewed at the Summit Ridge Genesis Healthcare Center, West Orange, New Jersey. To obtain further validity for the interviews, interviews were conducted individually. Each interviewee offered their own response. Additionally, matching questions were proffered to the participants, permitting their answers to be studied properly.

Items brought for Interview/Data Collection

- Voice recorder

- Notebook
- Consent Forms
- Interview questions
- IRB approval Letter
- Pen, Pencils, and Eraser
- Portfolio-safeguard data collection items
- Envelopes to label, place, and seal interview responses

C) Estimated Time of Interviews

- 1) 1 hour (Projected amount time per interview).
- 2) Between 10 persons from Summit Ridge Genesis Healthcare Center, West Orange, New Jersey/ nursing department were interviewed.
- 3) Interviews/data collection concurrently within 1-4 weeks.

D) Utilization of Theories of Robust Transformation (ART) and Epidemiological Triangle (ET)

- 1) How can the GHCC nursing department boost its system/procedures to improving nurse preparedness, policies, and practices for bioterrorism events?

E) Case Study Questions for Participants

- 1) Please provide a brief background of your professional experience.
- 2) How many nurses are in your department?
- 3) What is your perception about bioterrorism?
- 4) Does your nursing department have a bioterrorism preparedness and response plan?

- 5) Please explain any types of special training there is for nurses in Summit Ridge Genesis Healthcare Center (GHCC) in preparing for a biological attack?
- 6) What is your perception about the readiness of GHCC for a virulent biological agent release response?
- 7) What is your perception about GHCC coordinating with other hospitals within and outside the State of New Jersey to prepare for a biological attack?
- 8) Can the GHCC coordinate with citizens in the community in preparing for a biological attack?
- 9) Does the GHCC coordinate with the State of New Jersey in preparing for a virulent biological agent release?
- 10) Have you participated in full-scale simulation preparation of a biological attack exercises?
- 11) How often are full scale simulation exercises performed in preparation of a biological attack?
- 12) What are your perceptions in greater detail what involves full-scale simulation exercise of a biological attack?
- 13) What other aspects of Table-top Exercises does the GHCC perform to prepare for a biological attack?
- 14) Please explain in detail the plans and resources that have been identified in advance if a biological attack was to occur.
- 15) Does GHCC have designated space or area for victims or suspected victims of a biological agent or bioterrorism? Please explain?

- 16) In your view, is the GHCC equipped and the nurses prepared to treat victims of virulent biological agent attack?
- 17) If a bioterrorism attack were to occur in the State of New Jersey., being that GHCC is not a sub-acute a designated hospital, how will the GHCC coordinate and allocate human resources?
- 18) In the event of a biological releases/crisis has the GHCC recognized how nurses within the Center, will be tasked with preparedness, response and assignment?
- 19) What procedures are in place to broadcast information to the stakeholders or citizens in a well-organized method during a biological agent release?
- 20) How can current policies and practices in the GHCC be improved to better prepare nurses for a virulent biological attack response?